2024 Annual Development, Operations, and Monitoring Report
Amherst Island Waste Disposal Site

Prepared for The Corporation of Loyalist Township

April 2025
File: 061-231.00

MALROZ

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	
Waste Disposal Site Name	Amherst Island Waste Disposal Site
Location (e.g. street address, lot, concession)	Part Lot 29 Concession 1, Geographic Township of Amherst Island
GPS Location (taken within the property boundary at front gate/ front entry)	362268E 4891360N NAD 83, Zone 18
Municipality	Loyalist Township
Client and/or Site Owner	The Corporation of Loyalist Township
Monitoring Period (Year)	2024
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval Number:	A710121 (Certificate of Approval)
Director's Order No.:	N/A
Provincial Officer's Order No.:	N/A
Other:	N/A

Report Submission Frequency	◉ **Annual** ○ **Other**	Specify: Submitted by April 30 of the year following the calendar year covered by the report.	
The site is: **(Operation Status)**	◉ **Open** ○ **Inactive** ○ **Closed**		
Does your Site have a Total Approved Capacity?	◉ **Yes** ○ **No**		
If yes, please specify Total Approved Capacity	44500	*Units*	Cubic Metres
Does your Site have a Maximum Approved Fill Rate?	○ **Yes** ◉ **No**		
If yes, please specify Maximum Approved Fill Rate	N/A	*Units*	
Total Waste Received within Monitoring Period (Year)	445	*Units*	Cubic Metres
Total Waste Received within Monitoring Period (Year) *Methodology*	surveyed using a Trimble R10 GNSS		
Estimated Remaining Capacity	10,923	*Units*	Cubic Metres
Estimated Remaining Capacity *Methodology*	difference between annual surveys and approved total capacity		
Estimated Remaining Capacity *Date Last Determined*	January 2025		
Non-Hazardous Approved Waste Types	☒ Domestic ☐ Industrial, Commercial & Institutional (IC&I) ☐ Source Separated Organics (Green Bin) ☐ Tires	☐ Contaminated Soil ☐ Wood Waste ☐ Blue Box Material ☐ Processed Organics ☐ Leaf and Yard Waste	☐ Food Processing/Preparation Operations Waste ☐ Hauled Sewage Other: Domestic and Non-hazardous solid industrial waste (per ECA)
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*			
Year Site Opened *(enter the Calendar Year only)*	unknown	**Current ECA Issue Date**	November 10, 2006
Is your Site required to submit Financial Assurance?	○ **Yes** ◉ **No**		
Describe how your Landfill is designed.	◉ Natural Attenuation only ○ Fully engineered Facility ○ Partially engineered Facility		
Does your Site have an approved Contaminant Attenuation Zone?	◉ **Yes** ○ **No**		

If closed, specify C of A, control or authorizing document closure date:	

Has the nature of the operations at the site changed during this monitoring period?	○ **Yes** ◉ **No**
If yes, provide details:	Type Here
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)	○ Yes ◉ No

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

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:	(●) **Yes** ( ) **No**	If no, list exceptions (Type Here):
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):	( ) **Yes** (●) **No** ( ) **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
MW-TP4	not sampled due to dry conditions	May 31 and November 25, 2024
MW-1a	not sampled due to dry conditions	November 25, 2024

3) a) Is landfill gas being monitored or controlled at the site?	◉ **Yes** ○ **No**	
If yes to 3(a), please answer the next two questions below.		
b) Have any measurements been taken since the last reporting period that indicate landfill gas is present in the subsurface at levels exceeding criteria established for the site?	○ **Yes** ◉ **No**	
c) Has 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: or MECP Concurrence (see report)	◉ **Yes** ○ **No** ○ **Not Applicable**	If no, list exceptions below or attach additional information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

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):	◉ **Yes** ○ **No**	See report for details of SOP.

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

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.	(●) **Yes** ( ) **No**	If no, the potential design and operational concerns/exceptions are as follows (Type Here):	
6) The site meets compliance and assessment criteria.	( ) **Yes** (●) **No**	Groundwater is evaluated with a trigger mechanism using Guideline B-7. Trigger well MW-1a exceeded the B-7 concentrations for TDS in May, but was dry in November.	
7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.	(●) **Yes** ( ) **No**	See report for discussion of trends.	
1) Is one or more of the following risk reduction practices in place at the site: ***(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** ***(b)*** **There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or** ***(c)*** **The site meets the following two conditions (typically achieved after 15 years or longer of site operation):** ***i.*** **The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and** ***ii.*** **Seasonal and annual water levels and water quality fluctuations are well understood.**	(●) **Yes** ( ) **No**	**Note which practice(s):**	☐ **(a)** ☐ **(b)** ☒ **(c)** As discussed in report.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	( ) **Yes** (●) **No** ( ) **Not Applicable**	See report for discussion.	

Groundwater CEP Declaration:

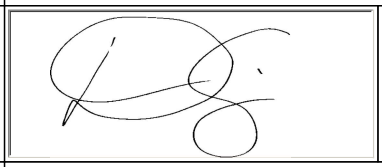
I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts 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, as deemed appropriate for this Site in my professional judgement, 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 analyzed 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.

The completion of this Checklist is a requirement of the MECP. As always, we rely upon the MECP to undertake a complete review the report(s) provided regarding the waste disposal site/landfill, and provide their comments and acceptance of our interpretation, conclusions and recommendations. The Checklist should in no way supersede the MECP's responsibility to undertake their complete review of our report(s) to ensure Site compliance with environmental regulations, standards and/or approvals.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**	See report for discussion.
○ **The following change(s) to the monitoring program is/are recommended:**	
◉ **No Changes to site design and operation are recommended**	See report for discussion.
○ **The following change(s) to the site design and operation is/ are recommended:**	

Name:	David Carnegie, M.Sc., P.Eng.		
Seal:	Add Image		
Signature:		**Date:**	April 30, 2025
CEP Contact Information:	David Carnegie, M.Sc., P.Eng.		
Company:	Malroz Engineering Inc.		
Address:	308 Wellington St., 2nd Floor, Kingston ON		
Telephone No.:	613-548-3446 ext. 27	Fax No. :	Type Here
E-mail Address:	carnegie@malroz.com		
Co-signers for additional expertise provided:			
Signature:		**Date:**	Select Date
Signature:		**Date:**	Select Date

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):

Name (s)	An un-named drainage ditch adjacent to landfill
Distance(s)	Along eastern property boundary

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

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:	(●) Yes ( ) No	See report for discussion.
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):	( ) Yes (●) No ( ) **Not applicable (No C of A, authorizing / control document applies)**	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
SW-DP, SW-DD	not sampled due to dry conditions	May 31, 2024
SW-DU, SW-DD, and SW-DP	not sampled due to dry conditions	November 25, 2024
Type Here	Type Here	Select Date

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, or MECP concurrence.	◯ **Yes** ◉ **No** ◯ **Not Applicable**	
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:	◯ **Yes** ◯ **No** ◉ **Not Applicable**	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**
Type Here	Type Here	Select Date

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):	◉ **Yes** ◯ **No**	See report for discussion of SOPs.

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 exceedences of criteria, based on MECP 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
Total Phosphorus	PWQO	exceeded PWQO in May 2024 at SW-DU (up-gradient sample location)
Iron	PWQO/APV	exceeded PWQO and APV in May 2024 at SW-DU (up-gradient sample location)
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**	Iron and total phosphorus concentrations are elevated at the background location, similar to previous results; other surface water stations could not be sampled due to dry conditions. See report for discussion.

7) 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.	◉ **Yes** ◯ **No**	If no, list parameters and stations that is outside the expected range. Identify whether parameter concentrations show an increasing trend or are within a high historical range (Type Here) See report for discussion. Leachate indicator parameters fall within the historic range of results. The presently available data do not suggest a change in trends. The ditch that surface water samples are collected from was characterized by low water levels in 2024.
8) 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)):	◉ Yes ◯ No ◯ Not Known ◯ Not Applicable	If yes, provide details and whether remedial measures are necessary (Type Here): See report for discussion. The drainage ditch is an anthropogenic feature with ephemeral flow and is not expected to be fish habitat. Remedial measures do not appear to be required at this time given that groundwater is not used as a potable source of drinking water. Groundwater is evaluated in accordance with a trigger mechanism using Guideline B-7.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	◯ **Yes** ◉ **No** ◯ **Not Applicable**	If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here):

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, as deemed appropriate for this Site in my professional judgement, the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MECP, 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.
The completion of this Checklist is a requirement of the MECP. As always, we rely upon the MOE to undertake a complete review the report(s) provided regarding the waste disposal site/landfill, and provide their comments and acceptance of our interpretation, conclusions and recommendations. This Checklist should in no way supersede the MECP responsibility to undertake their complete review of our report(s) to ensure compliance with environmental regulations, standards and approvals.
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:

Select Date

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:**	Type Here
◉ **No changes to the site design and operation are recommended** ○ **The following change(s) to the site design and operation is/are recommended:**	Type Here

CEP Signature	
Relevant Discipline	Engineer with relevant experience and training.
Date:	April 30, 2025
CEP Contact Information:	David Carnegie, M.Sc., P.Eng.
Company:	Malroz Engineering Inc.
Address:	308 Wellington St., 2nd Floor, Kingston ON
Telephone No.:	613-548-3446 ext. 27
Fax No. :	Type Here
E-mail Address:	carnegie@malroz.com

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Notice To Reader

This document has been prepared by Malroz Engineering Inc. (Malroz) on behalf of Loyalist Township in fulfilment of Condition No. 26 of Provisional Certificate of Approval (C of A) No. A710121 for the Amherst Island waste disposal site.

Malroz has prepared this report using information understood to be factual and correct and assumes no responsibility for the accuracy of information provided by others.

This document has been prepared for Loyalist Township for submission to the Ministry of Environment, Conservation and Parks (MECP) as required by the C of A. Unauthorized re-use of this document for any other purpose, or by third parties without the express written consent of Malroz shall be at such party's sole risk.

This page is an integral part of this document and must remain with it at all times.

Respectfully Submitted,

Malroz Engineering Inc.

per: Ryan Fox, P.Eng.
Environmental Engineer

and: David Carnegie, P.Eng.
Project Manager

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Appendices

1.0 Introduction

The Amherst Island waste disposal site (WDS), located at 145 Dump Road, operates under the Provisional Certificate of Approval (C of A) No. A710121. The C of A was issued by the Ministry of the Environment, Conservation and Parks (MECP[(1)]) is dated March 14, 1997, and was amended October 13, 2000, and November 10, 2006.

Malroz Engineering Inc. (Malroz) was retained by Loyalist Township (the Township) to assist the municipality in fulfilling the annual monitoring and reporting requirements of the C of A (see Appendix A).

1.1 Purpose of Report

This 2024 report fulfills the annual reporting requirement for the Amherst Island WDS including:

- delineation of the existing limits of the fill area of the disposal site;
- quantity of wastes received and deposited on to the site;
- remaining site capacity;
- conformance with D&O plan;
- operational problems encountered and/or complaints received and remedial actions taken;
- the status of monitoring wells and their conformance with O. Reg. 903/90;
- monitoring program results, data interpretation and recommendations;
- groundwater and surface water monitoring and sampling, at locations predetermined by the C of A (see Appendix A) and later revised in accordance with MECP correspondence;
- monitoring program results, data interpretation and recommendations; and
- waste deposit locations for the next 12-month period.

2.0 Background

The Amherst Island WDS has been in operation since circa 1964 and operates under Provisional C of A No. A710121, issued on March 14, 1997 and amended on October 13, 2000, to correct an error regarding approved fill area. A subsequent amendment was obtained on November 10, 2006 to revise the annual reporting submission date to April 30 of each year and to recognize CAZ property.

The Township has acquired groundwater water rights to approximately 4.2 ha of lands located to the east of the WDS which serves as a Contaminant Attenuation Zone (CAZ).

(1) Changes to the name of the Ministry of the Environment, Conservation and Parks (MECP) have occurred since the Ministry was founded in 1972. This report inclusively refers to the current name, and previous names, including Ministry of the Environment (MOE) and Ministry of the Environment and Climate Change (MOECC), by the acronym MECP.

Historical documents referenced in preparation of this report have included Annual Reports prepared by TSH/AECOM, Hydroterra, and Malroz for the 1996 through 2023 period.

Previous reports have not identified ongoing exceedances of the MECP[2] B-7 Reasonable Use Guideline at the WDS. The 2023 Annual Report for the WDS (Malroz, 2024), estimated that the WDS had capacity to service the residents of Amherst Island for between 17 and 37 years based on the maximum and average historic fill rates, respectively.

The site, geologic, and hydrogeological setting of the WDS and surrounding was described in 1996 by Malroz Engineering Inc.[3] and is summarized in the subsections which follow.

2.1 Site Setting

The WDS is located at 145 Dump Road, approximately 2 kilometers west of the Hamlet of Stella, on Amherst Island. The WDS comprises an area of approximately 13 ha, including approximately 4.2 ha of CAZ (see Figure 1, Appendix B).

Properties located adjacent to the landfill are used for agricultural purposes. The nearest residences are located approximately 200 m north of the WDS, across Front Road.

The WDS is bordered by fences along the north, south and east sides of the site. Fallow agricultural lands border the WDS to the west.

2.2 Geologic Setting

Geology of the area is characterized as a tight, flat lying limestone, interbedded with regular thin shale partings to depths greater than 50 metres. Evaporitic minerals occur within the limestone lithology. The limestone is overlain by a thin veneer of silty clay soils averaging less than one metre in thickness. A cross section summarizing the conceptual understanding of the geologic setting and copies of borehole logs from previous investigations are provided in Appendix C.

2.3 Hydrogeological Setting

Groundwater quantity and quality in the study area is poor. A survey (1996) of existing and potential groundwater users within a 1-kilometre radius of the waste disposal site indicated no groundwater use for residential or agricultural purposes. The main reasons cited were low yields and poor water quality. The primary source of water in the area is shore wells.

The hydrogeology of the site can be divided hydro-stratigraphically into a lower and an upper regime. The lower regime is controlled by tight bedrock conditions and behaves

[2] Changes to the name of the Ministry of the Environment, Conservation and Parks have occurred since the Ministry was founded in 1972. This report inclusively refers to the current name, and previous names, including Ministry of the Environment (MOE) and Ministry of the Environment and Climate Change (MOECC), by the acronym MECP.

[3] Malroz Engineering Inc. February 1996, *Hydrogeologic Study*, Prepared for The Township of Amherst Island

as an aquitard with hydraulic conductivities less than 10^{-7} centimetres per second(3). The upper regime, controlled by overburden, shallow bedrock fractures, and surface topography, behaves as an unconfined aquifer. Hydraulic conductivities for the upper regime were variable, ranging from less than 10^{-7} to 10^{-4} centimetres per second(3).

The inferred direction of groundwater flow was north towards Lake Ontario. The calculated horizontal hydraulic gradient in the study area was 4 percent. Insufficient data was available to calculate the vertical gradient. The upper regime was identified as being most likely to be impacted by leachate.

2.4 Water Chemistry

A network of 24 surface water and groundwater sampling points was previously used to evaluate water chemistry near the WDS. The groundwater chemistry of the site is complex due to dissolution of substances from the tight limestone bedrock.

Chemistry from sampling points proximal to the WDS and in the upper hydro stratigraphic regime indicated elevated inorganic substances such as chloride, however, these concentrations were interpreted to be the result of dissolution from bedrock, because other parameters, typically associated with landfill leachate, such as COD, TOC, and BOD were not present at significant concentrations. Similar chemistry was observed in the other sampling locations including the surface water location immediately downstream from the waste disposal site.

Malroz interpreted that leachate had not migrated off-site at concentrations significantly above background concentrations, although high background concentrations of certain substances and the fractured bedrock setting could mask leachate movement. Further discussion of the chemistry was provided in the 1996 Hydrogeological Study(3). Statistical analyses of historical chemistry are included in Appendix D.

3.0 MECP Correspondence

No MECP correspondence with respect to the Amherst Island WDS was provided to Malroz in 2024.

4.0 Report On Development and Operations Plan

In accordance with the WDS C of A, the Site is actively landfilling solid non-hazardous waste. The WDS also accepts recycling materials, large electric appliances, and metals for bulking and subsequent transfer off-site. No liquid industrial or hazardous wastes are accepted.

4.1 Service Area and Population

In 2021 (most recently available census data), the WDS served a local population of 435 year round(4) residents, that is estimated to double seasonally. Significant population increases are not expected on the basis of past growth rates. Land use activities on the island are primarily residential and agricultural, with a minor commercial component

(4) Statistics Canada. 2021. Loyalist TP [Census Subdivision] Ontario and Canada. Census Profile. 2021 Census. Statistics Canada Catalogue no. 98-316- X2021001. Ottawa. Released February 9, 2022.

including retail, and bed and breakfast establishments. The population serviced by the WDS in 2024 was estimated by Loyalist Township to be approximately 450.

4.2 Site Access

The WDS is accessed from Dump Road. Access is controlled by a locked gate and restricted to posted times.

4.3 Phasing of Site Usage

Previous reports for the WDS identify two phases of waste filling. Active filling is currently occurring on Phase 1 (Part C), located on the northern and western extent of the WDS (see Figure 2, Appendix B).

Once Phase 1 has reached capacity, filling of Phase 2 will be initiated, and waste will be deposited in Part B to the south of Part A. The ECA notes that development of Phase 2 shall not take place until appropriate studies are undertaken to demonstrate that the current operations are not causing adverse impact to the environment, and that the studies shall be to the satisfaction of the Regional Director.

4.4 Site Operation

The Amherst Island WDS continues to be a well-operated facility. During 2024, operation of the WDS remained in general compliance with its C of A and D&O Plan.

No problems requiring modifications from standard operational practices were experienced at the site. No vermin or vector outbreaks were reported. No public complaints concerning adverse impacts from the WDS were received. Township staff reported that no loads of waste were refused in 2024.

The Township replaced the perimeter fence in October 2024 to ensure that the Site remains secure. As a component of this work some tree and brush removal/pruning was completed.

According to previous reports, a minor amount of waste has exceeded the final approved contour elevations due to the northern slope exceeding the 4 to 1 ratio identified in the D&O plan. Regrading and a slope adjustment will be required at the time final cover is applied to the landfill.

Historically, waste received at the WDS was deposited in a berm with heights in excess of 3 metres along the northern boundary of the site (Phase 1- Part A). In 2024, received waste was evenly distributed and compacted across the western portion of the Phase 1 area in a progressive manner. Waste will reportedly continue to be placed within Part C in 2025 (see active fill area, Figure 2).

The WDS received only household, commercial and municipal wastes. Curbside waste collection is not undertaken on Amherst Island and waste is dropped off by citizens during posted hours of operation. An attendant was present during open hours to direct the deposit of waste. Solid waste accepted for disposal at the site was not weighed, however, the number of bags received are recorded by the attendant.

4.4.1 Waste Diversion

The recycling depot established at the WDS continued to divert material from the landfill in 2024. The hours of operation for the recycling depot are the same hours as those for the landfill.

Areas for diversion of recyclable materials have been established separate from the active fill area. Typical recyclables include blue box materials, scrap metals, and tires.

In 2024, 49.34 tonnes of recyclable material including mixed paper, scrap metal, and mixed containers, were hauled from the Amherst Island landfill by Environmental 360 Solutions Ltd. (formerly Manco Recycling Systems Inc.) for processing at their Napanee facility.

Collection and reporting of blue box materials will transition from the responsibility of the Township in 2025 due to the forthcoming Province-wide implementation of a producer responsibility model for waste diversion (O. Reg 391/21), which will include implementation of new recycling bins and a change in recycling bin layout at the WDS (see Appendix E). After completion of the transition on July 1, 2025, Emterra will haul recyclables from the WDS.

Information on the Township's recycling and waste management practices, including the recycling transition beginning on July 1, 2025, as shown on the Township's website, is provided in Appendix E for reference.

4.5 Record Keeping

Daily records of waste materials received at the site were maintained by the Township and summarized weekly. An annual summary of the daily records from 2017 to end of 2024 is provided in the table below.

Year	Domestic (bags)	Ferry (bags)	Roads Garage (bags)	Park (bags)	Fire Hall (bags)	Total Bags	Tires (#)
2017	4,089	218	40	58	10	4,415	13
2018	5,034	228	49	58	6	5,375	12
2019	5,055	236	53	50	18	5,412	10
2020	5,104	183	48	55	5	5,395	11
2021	6,030	164	51	90	17	6,352	53
2022	5,997	133	44	59	8	6,241	47
2023	6,091	43	39	91	9	6,273	41
2024	6,031	2	35	77	36	6,181	70

Note: annual summary data prior to 2017 not previously reported. Data Input: RF
Data Check: ZL

A comparison of the attendant records from 2024 and those reported in the 2023 D&O report indicate an approximate 1.5% decrease in the total bags of refuse received at the WDS in 2024.

4.6 Remaining Site Capacity and Financial Reporting

Historic fill rates and average annual usage were presented in the 2016 Annual Report prepared by AECOM. AECOM reported that since 1998, the site had used an average of 288 m^3 of capacity per year. AECOM reported that 9,276 m^3 of capacity remained in Phase 1 and 4,800 m^3 remained in Phase 2 at in the end of 2016. This remaining capacity has been relied upon by Malroz to determine remaining capacity based on a survey of annual fill rates in the active fill area since 2016.

In January 2025, Malroz conducted a capacity survey using a Trimble R10 GNSS system, to survey the change in volume of the active fill area at the WDS. Results of the January 2025 survey and past surveys conducted by Malroz and AECOM have been tabulated below. Deposited volumes are subject to inherent errors associated with surveying uneven surfaces such as waste faces.

Based on the historic data and our survey in January 2025, an estimated total of 10,923 m^3 of capacity remains at the WDS.

Date	Months Preceding Survey	Site Usage (m^3)	Average Annual Fill Rate (m^3/yr)	Estimated Remaining Capacity (m^3)
Dec-98	--	--	--	19,242
Apr-00	16	450	450	18,792
Mar-01	11	500	475	18,292
Dec-01	9	200	383	18,092
Nov-02	11	292	361	17,800
Nov-03	12	320	352	17,480
Nov-04	12	350	352	17,130
Oct-05	11	370	355	16,760
Nov-06	13	270	344	16,490
Oct-07	11	150	322	16,340
Nov-08	13	460	336	15,880
Sep-09	10	260	329	15,620
Sep-10	12	350	331	15,270
Oct-11	13	240	324	15,030
Nov-12	13	260	319	14,770
Dec-13	13	180	310	14,590
Dec-14	12	140	300	14,450
Dec-15	12	230	295	14,220
Dec-16	12	144	287	14,076
Dec-17	12	515 (292)	299	13,561
Dec-18	12	515	310	13,046
Dec-19	12	377	316	12,669
Dec-20	12	204	308	12,465
Dec-21	12	657	323	11,808

Date	Months Preceding Survey	Site Usage (m^3)	Average Annual Fill Rate (m^3/yr)	Estimated Remaining Capacity (m^3)
Dec-22	12	314	323	11,494
Dec-23	12	126	309	11,368
Jan-25	13	445	307	10,923

Notes:

Data prior to December 2017 provided by AECOM.
Brackets denote superseded quantity.
Average annual usage is based on dataset from 2000-2024.

Input: ZL
Checked: RF

The 2016 AECOM report discussed waste generation and used a projected 440 m^3/year to calculate life span; however, WDS use rates have been lower than that since 2009 (with the exception of 2017, 2018, 2021, and 2024).

Using the maximum fill rate (657 m^3) observed at the site between 2000 and 2025, Malroz estimates that the minimum anticipated lifespan of the landfill is 16 years; assuming that the MECP permits the development of Phase 2. Should permission not be granted to develop Phase 2, the minimum anticipated lifespan in Phase 1 based on the historical maximum rate, is approximately 10 years.

Using the observed average annual fill rate of 307 m^3/year (calculated since 2000), Malroz anticipates that the lifespan of the landfill could extend as long as 36 years; assuming that Phase 2 is developed. Should Phase 2 not be developed, the anticipated maximum lifespan based on current average fill rates is approximately 20 years.

Item	Phase 1	Phase 2
Total Site Area	12.982	
Approved Area of Waste Disposal (ha)	0.8 ha	0.43 ha
Total Approved Area of Waste Disposal (ha)	1.225	
Current Area of Waste Disposal (ha)	1.152	
Total Site Capacity Including Final Cover (m^3)	30,200	14,300
Allowance for Final Cover (m^3)	6,000	3,200
Total Site Capacity Less Final Cover (m^3)	24,200	11,100
Capacity Used to Date (m^3)	18,077	6,300
Remaining Capacity for Waste Disposal (m^3)	6,123	4,800
Total Remaining Capacity (m^3)	10,923	
Minimum Anticipated Lifespan [1]	9	7
Anticipated Lifespan [2]	20	16
Total Minimum Anticipated Lifespan	16	
Total Anticipated Lifespan	36	
Estimated closure Cost (2025 Dollars)	$442,000	$256,000
Estimated Post Closure Monitoring Cost (2025 Dollars)	11,350	
Estimated Post Closure Annual Maintenance (2025 Dollars)	$1,600	

Closure, monitoring, and maintenance costs based on estimates provided in an email to Thomas Bertin dated March 14, 2025.

Input: RF
Checked: ZL

[1] based on remaining capacity and maximum historic fill rate observed since 2000.

[2] based on an average fill rate since 2000.

As a component of the remaining capacity and WDS lifespan estimates, Loyalist Township requested that Malroz provide estimates of landfill closure and post-closure costs to support preparation of annual financial statements. A summary of estimated closure costs was provided in a March 14, 2025, email to Township staff (Thomas Bertin). These estimates are summarized in the foregoing table and are based on a number of assumptions and limitations which are further described in the aforementioned transmittal. A full review of closure costs should be conducted at least 10 years prior to closure and include obtaining quotes for services and materials required for closure, to refine the closure cost estimates.

5.0 Groundwater Monitoring and Sampling

Malroz followed the groundwater program as specified in the C of A (i.e. 1996 Malroz Waste Disposal Site Development and Operations Plan) with the following variations:

- trigger mechanism analysis was discontinued in October 2010, as requested by MECP, and Guideline B-7 (formerly called the Reasonable Use Policy) was applied,
- the suite of groundwater analyses was changed to Schedule 5, Column 2 of the MECP Landfill Standards(5) and amended to include manganese, TKN, potassium, and hardness (MECP letter dated February 26, 2010),
- analyses for un-ionized ammonia (calculation based on total ammonia and field parameters), DO (field parameter), ORP (field parameter), and turbidity (field parameter) were included, and
- groundwater samples collected for analyses of metals were field filtered.

Groundwater sampling was conducted on May 31, and November 25, 2024. The groundwater program is summarized in Table 1, Appendix D.

5.1 Well Inspection

The general condition of each well was assessed during the monitoring program before sampling. This included inspecting the casing, piezometer and visible well seal, and noting if the well was properly secured and capped. The results of the well inspection are summarized in Table 2, Appendix D.

Monitoring wells were generally observed to be in fair or good condition. The hinge on the protective monument casing at MW-8a was observed to be broken, and should be considered for repair. MW-8a is located within the fenced portion of the waste disposal site and remains secured from public access.

Results of the 2024 groundwater and surface water, monitoring and sampling programs are described in the subsections which follow.

5.2 Methane Gas Monitoring

Methane gas was measured in each of the monitoring wells during each groundwater monitoring and sampling event (i.e. May and November, 2024) using measurements from a combustible gas indicator with a methane elimination switch. Methane concentrations are the difference in concentration between full gas response and methane elimination response. Methane concentrations are presented in Table 3 Appendix D.

Methane concentrations were below the detection limit of the instrument at each monitoring well with the exception of monitoring wells MW-3a and MW-3b during the May 2024 event and monitoring wells MW-2b, MW-3a, BH6, and MW-TP3 during the November 2024 event (see Figure 3, Appendix B), which reported measurable

(5) Ministry of the Environment, June 2010, Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New and Expanding Landfilling Sites.

concentrations of less than 1% of the lower explosive limit (LEL). These concentrations are considered relatively low and are generally consistent with historically reported observations.

Methane is a byproduct of anaerobic decomposition of organic compounds. Therefore, despite the relatively low methane concentrations observed during well monitoring, caution should be exercised when undertaking work within the fill area as methane gas may accumulate within the waste mound and adjacent areas. Malroz did not identify measurable methane concentrations in the ambient air during well monitoring.

5.3 Groundwater Flow Direction

Depth to groundwater measurements were collected from each well during the May and November groundwater sampling events in 2024. Groundwater elevations were calculated using survey data previously provided by AECOM.

Consistent with past results, the inferred direction of shallow and bedrock groundwater flow was generally north-northwest (relative to true north) towards Kerr Bay as depicted in Figures 3 and 4 (Appendix B), respectively. These results are consistent with previous findings.

5.4 Groundwater Chemistry

Groundwater sampling was completed at monitoring wells inferred to represent background (MW-7a), landfill leachate impacted (MW-8a) and downgradient (MW-1a, MW-2a, MW-TP4) locations (see Figure 3, Appendix B). Groundwater samples were submitted to an accredited laboratory for analyses as summarized in Table 4, Appendix D.

Monitoring well MW-TP4 was dry during both sampling events (i.e. May and November) in 2024; monitoring well MW-1a was dry during the November sampling event.

5.4.1 Compliance Criteria

Results of the groundwater monitoring and sampling program are compared to the Ontario Drinking Water Standards (ODWS) for references purposes only as groundwater in the vicinity of the WDS is not used for potable purposes as previously described (see Section 2.3). The B-7 Reasonable Use Policy is used to evaluate groundwater in accordance with the WDS trigger mechanism as further described in Section 5.6.

5.4.2 Groundwater Chemistry Evaluation

Groundwater chemistry results from the 2024 sampling event were compared to the Ontario Drinking Water Standards and Guidelines (ODWS) and are presented in Table 4, Appendix D. Concentrations were compared to the ODWS for reference purposes only. Exceedances of the ODWS are summarized below:

Parameter	May	November
Hardness	all sampled wells	all sampled wells
Alkalinity	MW-8a	MW-8a
Manganese	MW-2a, MW-8a	MW-8a
Iron	none	MW-8a
DOC	MW-8a	MW-8a
TDS	MW-1a, MW-8a	MW-2a, MW-8a
Temperature (field)	MW-1a, MW-2a	none

Exceedances of the ODWS are limited to parameters with an aesthetic objective or operational guideline and not representing a health risk according to the MECP.

Parameters exceeding the ODWS were within historic range of concentrations at each location (see Table 5, Appendix D).

The exceedances of hardness ODWS at the monitoring wells that were sampled (including background) are characteristic of the regional groundwater quality, and consistent with our conceptual understanding of the site.

Assessed parameters that met the ODWS, or do not have an ODWS, were within the historical ranges of concentrations at each location. Groundwater results should continue to be evaluated for emergent trends following completion of the groundwater sampling program in 2025.

Historically a sub-set of the available leachate indicating parameters (LIPs) including ammonia, conductivity, sulphate, iron, and boron have been used to evaluate leachate migration in groundwater. Elevated concentrations (relative to background) of the subset LIPs have historically been reported at monitoring well MW-8a which is consistent with its location proximal to, and downgradient of, the fill area.

- Concentrations of the subset LIPs at monitoring wells MW-1a, MW-2a, and MW-7a were generally lower than those reported at MW-8a in 2024.
- Concentration of the subset LIPs at MW-1a (trigger well) were generally higher than MW-7a (background monitoring well) during the spring sampling event. Monitoring well MW-1a was dry during the fall sampling event.
- Concentrations of the subset LIPs at MW-2a, were variably higher or lower than background with the exception of conductivity which was consistently higher at MW-2a than background during each sampling event, and boron which was consistently lower than background during each sampling event.

The results suggests that there are some weak leachate impacts at monitoring wells MW-1a and MW-2a, which is consistent with previous findings. Monitoring well MW-TP4 was observed to be dry during both the May and November sampling events in 2024.

Groundwater compliance at the WDS is evaluated through a trigger mechanism at MW-1a, which incorporates Guideline B-7 and is discussed further in Section 5.6.

5.5 Groundwater Quality Trends

Groundwater quality trends of historic chemistry have been graphed for five LIPs: ammonia, conductivity, iron, boron, and sulphate (Appendix F). Trends have also been tracked for chloride. Chloride is not considered a LIP at the WDS given that there does not appear to be a trend linked to leachate, and that observed concentrations appear to be related to the geological setting and/or local road salting. However, because chloride is a conservative indicator of leachate migration and formation geochemistry we continue to evaluate chloride trends for changes. Concentrations of the LIPs were within the historic range of results for each location in 2024.

Groundwater results should continue to be evaluated for emergent trends following completion of the groundwater sampling program in 2024.

5.6 Groundwater Trigger Mechanism

MOEE Guideline B-7 "*incorporation of the reasonable use concept into MOEE groundwater management activities*" (formerly known as the Reasonable Use Policy (RUP)) establishes the basis for determining the reasonable use of groundwater on property adjacent to sources of contaminants and for determining the levels of contaminant discharges considered acceptable by the Ministry.

Malroz previously discussed the application of Guideline B-7 to this site and concluded that since leachate had not been identified at or beyond the WDS property extents, the degradation potential of the groundwater could not be calculated. Malroz went on to evaluate the existing and potential uses of groundwater in the area and concluded that groundwater was not currently used for potable purposes, nor was it expected to be used in the future due to low yields and poor quality. Shore wells were the primary source of water supply for the area and were likely to remain the primary source of water for the future.

On June 5, 2003, the MECP insisted that Guideline B-7 be applied to the site to provide consistency across the province. The MECP did recognize the unique circumstances pertaining to the site: naturally salty wells masking the chemistry, groundwater not used for potable purposes, and no background chemistry due to tight bedrock conditions.

During a meeting on October 29, 2008, between the MECP, the Township, and Malroz, it was agreed that the MOEE Guideline B-7 reasonable use concept (also commonly referred to as the reasonable use policy (RUP)) would be applied to the site, and procedure B-7-1 would be used to determine reasonable use concentrations that would be applied to a mutually agreed to "trigger well" for the purpose of establishing a site trigger mechanism. The application of Guideline B-7 and development of the trigger mechanism was discussed in the 2003 Annual Report and updated in 2008.

Attempts were previously made to obtain permission to install an additional monitoring well in the farm field between the WDS and MW-7a. The Township owns the water rights beneath the farm field, and the intent was to develop a trigger well at this location. The well was not installed due to the objections of the property owner. As a result, MW-1a continues to be used as the interim trigger well. MW-1a is located downgradient of the active fill area and is halfway between the licensed fill area and the north edge of the

WDS property boundary. The property boundaries of the landfill and CAZ are indicated on Figure 1, Appendix B.

Procedure B-7-1 was used to calculate maximum acceptable contaminant concentrations (reasonable use concentrations) for the previously established trigger mechanism parameters chloride (141 mg/L), sodium (110 mg/L), iron (0.16 mg/L), TDS (465 mg/L), and boron (1.29 mg/L).

Concentrations of trigger mechanism parameter TDS exceeded the reasonable use concentration at the trigger well (MW-1a) during the spring sampling event. The concentration of TDS was within the historical range of results. MW-1a was observed to have dry conditions during the fall sampling event and could not be sampled. Dry conditions have historically been intermittently encountered at MW-1a.

A trigger exceedance was reported for iron during the spring sampling event at MW-1a in 2023; and MW-1a was dry during the fall event. Iron met the trigger concentration at MW-1a during the spring 2024 sampling event.

Concentrations of the trigger mechanism and reasonable use concentrations should continue to be evaluated in 2025 to determine if the 2024 TDS result from the spring sampling event was anomalous or indicative of an emerging trend.

Caution should be exercised in applying Guideline B-7 to this site. The site has complex chemistry, and naturally high background concentrations of typical landfill indicators are found as a result of the evaporitic minerals in the area.

6.0 Surface Water Monitoring and Sampling

The surface water program was conducted on May 31 and November 25, 2024. The scope of the program is summarized in Table 6, Appendix D.

Malroz followed the surface water program as specified in the C of A with the following variations:

- The suite of analyses was changed to Schedule 5, Column 4 of the MECP Landfill Standards[3] as recommended in the 2008 annual report.
- Further to an MECP memorandum (February 26, 2010), when sufficient flow permits, surface water location SW-DD is replaced by SW-DP to assess potential leachate impacted groundwater discharging to the ditch near the property line.
- Surface water stations SW-DD and SW-DP were observed to have dry conditions during the May sampling event.
- All surface water stations (SW-DU, SW-DD, and SW-DP) were observed to have dry conditions during the November sampling event and could not be sampled.

6.1 Surface Water Observations and Flow

A shallow drainage ditch runs along the east side of the WDS and flows north-northwest (relative to site north) towards Kerr Bay. Historically Malroz has monitored and sampled surface water from the ditch at a location upstream of the landfill (SW-DU) and a location

downstream of the landfill (SW-DD). On February 26, 2010, the MECP requested that sampling location SW-DD be replaced with sampling location SW-DP, upstream of Front Road, if sufficient flow was present (see Figures 3 and 4, Appendix B).

Surface water monitoring and sampling was conducted on May 31 (spring), and November 25 (fall), 2024. Surface water monitoring and sampling dates were chosen to follow rainfall events to increase the likelihood that viable samples would be collectable.

During the spring sampling event, dry conditions were observed at downgradient station SW-DD and alternate downgradient station SW-DP, and lentic conditions were observed at upgradient location SW-DU. Ditch discharge could not be calculated at surface water station SW-DU due to lentic conditions. Dry conditions were observed at each sampling station during the fall sampling event. Evidence of staining or odours were not observed at the surface water stations in 2024.

6.2 Interaction Between Groundwater and Drainage Ditch

Elevations of the ditch invert at the up-gradient and down-gradient sample stations were surveyed by AECOM (formerly TSH) in 2008:

- Up-gradient Ditch Elevation (SW-DU): 97.78 m
- Down-gradient Ditch Elevation (SW-DD): 96.87 m

The elevations of the ditch invert at each of the surface water sampling stations were compared to the shallow groundwater table measured in May and November 2024 (see Table 7, Appendix D).

Since no existing monitoring wells in the active fill zone are available, monitoring wells MW-TP1 and MW-TP2 were used for comparison at the up-gradient surface water station (SW-DU) and monitoring wells MW-8a and MW-2a were used for the down-gradient surface water station (SW-DD).

The shallow groundwater table appeared to be slightly lower but similar (i.e., within 5 cm) in elevation to the invert of the ditch at the upgradient station during the spring monitoring event; both monitoring wells and the upgradient station were dry during the fall monitoring event. The shallow groundwater table at the downgradient stations during the spring and fall monitoring events were higher than the ditch invert; however, during the spring and fall monitoring events, the downgradient ditch surface water stations (SW-DD and SW-DP) were dry. These results suggest groundwater is generally discharging to the ditch, which is consistent with our prior observations; however, given the absence of surface water in the ditch, at times when the groundwater is elevated relative to the ditch invert, it is possible that the ditch invert elevation has changed over time or there is some other factor limiting discharge (e.g. soil conditions, vegetation).

6.3 Surface Water Chemistry

Surface water sampling is completed at stations established in a ditch that extends from southeast to northwest along Dump Road (Figures 3 and 4, Appendix B). Surface water station SW-DD is located down-gradient of the WDS and surface water station SW-DU

is located up-gradient of the WDS. At the MECP's request, the surface water program was amended in November 2010 to include an alternate downstream surface water monitoring station (SW-DP) when sufficient flow is present. Surface water station SW-DP is located northwest (further downgradient) of surface water station SW-DD, near Front Road and is referenced as the "near property line" surface water station.

Surface water stations SW-DP and SW-DD could not be sampled during the spring sampling event due to dry conditions. All surface water stations were observed to be dry during the fall sampling event and could not be sampled.

Surface water LIPs (ammonia, chloride, conductivity, iron, and sulphate) were within the historic range of results at SW-DU in 2024 (SW-DP and SW-DD could not be sampled) during the spring sampling event (see Appendix F; and Table 9, Appendix D).

Surface water chemistry has been compared to the Provincial Water Quality Objectives (PWQO) and, the Table A Assessment Criteria for Waste Disposal Sites and Table B Guidelines (CWQGs) as prescribed in the MECP Technical Guidance Document[6]. The surface water chemistry data are presented in Table 8, Appendix D. Exceedances of the reference objectives, criteria, and guidelines are summarized below by sampling event.

PWQO Exceedances

Parameter	May	November
Total Phosphorous	SW-DU	dry
Iron	SW-DU	dry

Table A APV Exceedances

Parameter	May	November
Iron	SW-DU	dry

The concentrations of iron and total phosphorus exceeded the PWQO at the upstream surface water station (SW-DU) during the spring sampling event, however, concentrations of these parameters were within their respective historical ranges of values at SW-DU. Iron concentrations in excess of the PWQO may cause iron staining; phosphorus concentrations in excess of the PWQO may cause nuisance aquatic plant growth.

Iron concentrations also exceeded the Table A: Assessment Criteria for Waste Disposal Sites at the upstream station (SW-DU), during the spring sampling event. The Table A: Assessment Criteria for iron represent the lowest chronic adverse effects level based on the MECP (2010) Technical Guidance Document[5]. The concentration of iron was within the historic range of values.

Seasonal comparison of concentrations at the upstream and downstream locations could not be made due to dry conditions at the downstream stations during the spring

[6] Ministry of the Environment, November 2010. *Monitoring and Reporting for Waste Disposal Sites: Groundwater and Surface Water Technical Guidance Document*.

and fall sampling events, and at the upstream station during the fall sampling event. Comparison between surface water stations could not be made due to dry conditions as previously noted.

Historical sampling results generally indicate that iron and total phosphorous concentrations have historically been greater at the upstream station (SW-DU), relative to the downgradient stations, indicating possible background loading of the ditch (Table 9, Appendix B).

Past results have indicated some potential leachate impact to the drainage ditch adjacent to the WDS. Results in 2024 are generally consistent with our past conceptual understanding and review of historic data, as concentrations fell within the historical ranges for SW-DU, and given that the remaining surface water stations could not be sampled due to dry conditions which have intermittently been observed in the past.

7.0 Conclusions and Recommendations

The following subsections summarize our conclusions and recommendations with respect to development, operations, and annual monitoring at the Amherst Island WDS.

7.1 Development and Operations

Loyalist Township (Township) operated the Amherst Island Waste Disposal Site (WDS) in general compliance with its current Certificate of Approval (C of A) No. A710121, and Development and Operation (D & O) Plan in 2024.

- No significant operational issues were reported.
- Based on the results of the 2024 capacity survey, approximately 445 m^3 of material was placed at the site. A range of predicted landfill life spans was calculated using the average fill rate (since 2000) and the maximum reported fill rate for the same period. On the basis of these values, the WDS has between 16 and 36 years of capacity remaining assuming that the historic rate of use trends continue.
- Records indicate 6,181 bags of refuse were deposited at the WDS in 2024. This is approximately 1.5% less than what was reported in 2023, however, was within the historic range of bags of refuse deposited at the WDS.
- WDS monitoring wells were generally reported to be in good condition and compliant with O. Reg. 903/90 requirements. The hinge on the protective monument casing at MW-8a (located within the fenced portion of landfill) was observed to be broken, and should be considered for repair.

7.2 Methane Monitoring

Methane concentrations were below the detection limit of the instrument at each monitoring well with the exception of monitoring wells MW-3a and MW-3b during the May 2024 event and monitoring wells MW-2b, MW-3a, BH6, and MW-TP3 during the November 2024 event, which reported measurable concentrations of less than 1% of the lower explosive limit (LEL). These concentrations are considered relatively low and are generally consistent with historically reported observations.

7.3 Groundwater Monitoring and Sampling

Concentrations of groundwater parameters in 2024 were within the historic range of results for each location.

Results continue to suggest that a weak leachate is influencing the wells immediately adjacent to the landfill waste area (MW-8a and MW-2a). We infer that a weak leachate plume extends as far as monitoring well MW-1a, within the attenuation zone. The lower concentrations of common LIPs at these wells in comparison to the leachate indicator well MW-8a, suggest that the leachate plume is undergoing attenuation. Consistent with past results, the inferred direction of groundwater flow is north-northwest.

The groundwater trigger mechanism values are based on MOEE Guideline B-7 and calculated using Procedure B-7-1. The trigger well (MW-1a) exceeded the trigger concentration for TDS in May 2024. MW-1a was observed to have dry conditions in November 2024 and could not be sampled. The concentration of TDS was within the historical range of results, and does not appear to be indicative of an increasing trend. A trigger exceedance for iron during the spring sampling event was reported at MW-1a in 2023; the concentration of iron met the trigger concentration during the spring 2024 sampling event.

7.4 Surface Water Monitoring and Sampling

Surface water stations SW-DP and SW-DD were dry at during the spring sampling event, and a surface water sample was collected during lentic conditions at surface water station SW-DU. Each monitoring station was observed to be dry during the fall sampling event.

Leachate indicator parameters reported at SW-DU were within the historic range during the spring sampling event in 2024.

Caution should continue to be exercised when interpreting results from samples collected during lentic surface water conditions due to the possibility of concentrated levels of inorganics due to stagnation and evaporation.

Results of surface water sampling continue to suggest some potential leachate impact to the drainage ditch adjacent to the WDS, however, concentrations of some parameters such as iron and ammonia, are inferred to be influenced by background loading based on our conceptual understanding of the site setting.

7.5 Recommendations

We offer the following recommendations regarding the 2024 results and conclusions:

- Annual inspections of well integrity should continue to ensure wells remain in good condition and continue to meet the requirements of O. Reg. 903/90.

- Methane is a byproduct of anaerobic decomposition of organic compounds. Therefore, despite the relatively low methane concentrations observed during well monitoring, caution should be exercised when undertaking work within the fill area as methane gas may accumulate within the waste mound and adjacent areas. Malroz did not identify measurable methane concentrations in the ambient air during well monitoring. Methane concentrations should continue to be monitored in 2025.

- Groundwater and surface water monitoring should continue to assess the discharge of contaminants from the WDS, and to provide early warning of developing problems. The early warning will allow the Township to take corrective measures, thus avoiding or minimizing potential environmental damage.

- The groundwater and surface water programs should continue with sampling in May/June (spring) and November (fall) as defined in the provisional C of A

- The concentration of trigger mechanism parameter values should continue to be evaluated in 2025 to determine if the observed exceedance of TDS was anomalous or indicative of an emerging trend. We continue to exercise caution in the application of Guideline B-7 to this WDS. The site has complex chemistry, and naturally high background concentrations of typical landfill indicators are found as a result of the evaporitic minerals in the area.

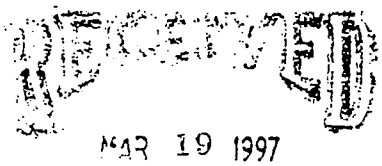
Appendix A
Certificate of Approval

Ministry of Environment and Energy

Ontario

PROVISIONAL CERTIFICATE OF APPROVAL FOR A WASTE DISPOSAL SITE

CERTIFICAT D'AUTORISATION PROVISOIRE DE DÉCHARGE



Provisional Certificate Number A710121
Certificat provisoire no.

Under the Environmental Protection Act and Regulations, and subject to the limitations thereof, this Provisional Certificate of Approval is issued to:
Aux termes de la Loi sur la protection de l'environnement et des règlements et sous réserve des restrictions qui y sont stipulées, le présent certificat provisoire d'autorisation est délivré à:

TO: Township of Amherst Island
Stella, Ontario
K0H 2S0

for the use and operation of a 0.8 hectare landfilling site within a total area of 7.93 hectares **all in accordance with the plans and specifications as listed in Schedule "A" which is attached and forms part of this Certificate, except as specified in the Terms and conditions of this Certificate,**

Located at: Township of Amherst Island
Part Lot 29, Concession 1
County of Lennox and Addington

which includes the use of the site only for the disposal of the following categories of waste:

non-hazardous solid domestic and commercial

and subject to the following definitions and conditions:

Definitions:

1.0 For the purpose of this Provisional Certificate of Approval:

1.1 "This Certificate" means Provisional Certificate of Approval No. A710121

1.2 "Director" means the Regional Director of the Eastern Region of the Ministry of Environment and Energy.

(2)

1.3 "District Manager" means the District Manager of the Kingston District Office, Eastern Region of the Ministry of Environment and Energy.

1.4 "Ministry or MOEE" means the Ontario Ministry of Environment and Energy.

1.5 "Owner" means Township of Amherst Island, its officers, employees, agents or contractors.

1.6 "EPA" means The Environmental Protection Act, chapter E.19, R.S.O. 1990.

1.7 "Site" means the landfill site located at Township of Amherst Island, Part Lot 29, Concession 1, approved under this Certificate.

General

2. This Provisional Certificate of Approval replaces all previous Provisional Certificates of Approval and Notices of Amendment identified by No. A370501 issued under Part V of the EPA.

3. This Certificate of Approval shall be registered on the title to the lands comprising the site. The owner shall register on title a survey of the lands comprising the site within 60 days of the issuance of this certificate of approval. No operation shall be carried out at the site after 60 days of this condition becoming enforceable unless the certificate has been registered by the owner as an instrument in the appropriate Land Registry Office against title to the site and unless a duplicate registered copy thereof has been returned by the owner to the Director.

4. The owner shall comply with the Conditions and Schedules in this certificate as modified or supplemented by the Director in accordance with the Director's mandate under the EPA. The requirements specified in this Certificate are minimum requirements and do not abrogate the need to take all reasonable steps to avoid violating the provisions of other applicable legislation.

(3)

5. The requirements of this certificate are severable. If any requirement of this certificate, or the application of any requirement of this Certificate to any circumstance is held to be invalid, the application of such requirement to other circumstances and the remainder of this certificate shall not be affected thereby.

6. The site shall be operated and maintained in accordance with the plans and specifications contained in the documents listed in Schedule "A". Should there be any discrepancy between the conditions on this certificate and the documents in Schedule "A", the conditions shall take precedence. Should there be discrepancies between documents in Schedule "A", the document bearing the most recent date shall prevail.

7. The owner shall provide training to all on-site personnel relating to the legal requirements for the operation of the site.

8. Only non-hazardous solid domestic and commercial wastes generated within the Township of Amherst Island shall be accepted for disposal at the site.

9. No liquid industrial wastes or hazardous wastes as defined under Regulation 347 shall be disposed of at the site.

Site Inspection

10. The owner must, forthwith on request, permit Provincial Officers to carry out inspections authorized by Sections 156, 157 or 158 of the Environmental Protection Act, Section 10, 10a or 10b of the Ontario Water Resources Act or Section 19 or 20 of the Pesticides Act, as amended from time to time, of any place, other than a room actually used as a dwelling, to which this Certificate relates.

Landfill Operations

11. The owner shall place a sign at the main entrance to the site on which is displayed in prominent letters the following information:

- the name of the site
- the operating authority
- the Certificate of Approval number for the site
- the hours the site is open to accept waste from the public
- the wastes acceptable for landfilling
- tipping fee rates
- the telephone number for reporting emergency situations occurring at the site during non-operating hours
- admission restrictions

12. The hours of operation at this site are:

Wednesday:	9:00 a.m. - 5:00 p.m.
Saturday:	9:00 a.m. - 5:00 p.m.
Sunday:	9:00 a.m. - 5:00 p.m.

The above hours may be amended with the written approval of the District Manager. During non-operating hours, the entrance gate to the site shall be locked to prevent access to the site by unauthorized persons.

13. Should an outbreak of vermin or vector occur at the site, the owner shall take all steps necessary to control the outbreak, including if necessary, the services of a licenced exterminator.

14. The owner shall ensure this site is operated in a manner which minimizes the impacts of odour, dust, litter, noise and traffic on the natural environment and the public.

15. The owner shall ensure that waste is stored in a safe and secure manner and that waste is properly handled and contained so as not to pose any threat to the public, site personnel or the natural environment.

(5)

16. No waste shall be received from the public for disposal at the site except during the posted hours when the site is under the supervision of the site attendant or his alternate.

17. The owner shall mark the corners of the area approved for landfilling with corner posts which shall be maintained so as to be visible throughout the year.

18. The owner shall set aside an area for the purpose of sorting and storing metals, cans, tires, appliances and newsprint.

19. The burning of wastes at this site is limited to brush and clean lumber.

20. On-site roads shall be routinely inspected to ensure they are maintained in a satisfactory condition. Signs of erosion or surface deterioration shall be promptly repaired. On site roads shall be treated with water or a dust suppressant as required to minimize dust generation.

21. An inspection of the site's perimeter and access road shall be carried out as required to ensure that litter is being adequately controlled on site. Litter from the site shall be picked up as needed along the site's perimeter and access roads.

22. Development of Phase 2 of the expansion of this site shall not take place until appropriate studies are undertaken to demonstrate that current operations at the site are not causing an adverse impact on the environment. The studies shall be to the satisfaction of the Regional Director, Eastern Region, MOEE.

23. The owner shall maintain a weekly record of the approximate quantity and types of waste received at the site for disposal. Records must be kept on the site for a minimum of two years.

24. The following information shall be recorded on loads refused access to the site for disposal purposes:
    - date
    - name of person
    - company name on vehicle
    - vehicle description and licence number
    - quantity and description of waste refused
    - reason for the refusal

Groundwater and Surface Water Monitoring

25. The owner shall implement the groundwater and surface water monitoring programs contained in the reports "Hydrogeological Study 1996", "Waste Disposal Site Development and Operations Plan" by Malroz Engineering Inc. dated February 1996 and in the letter from Malroz Engineering Inc. to the Ministry dated March 11, 1997. The monitoring program for surface water and groundwater is subject to any amendments which the Director or the District Manager may authorize or require in writing from time to time.

Reporting

26. An annual monitoring report on the development and operation of the site, including the monitoring programs, shall be submitted to the District Manager by March 31st of the year following the calendar year covered by the report. The report shall include but not be limited to the following information:

    - delineation of the existing limits of the fill area of the disposal site
    - quantity of wastes received and deposited on-site
    - remaining site capacity
    - conformance with development and operations plan
    - operational problems encountered and/or complaints received and the remedial action taken
    - monitoring program results, data interpretation and recommendations
    - waste deposition locations for the next 12 month period

(7)

The owner shall notify the Ministry immediately if adverse conditions are found. The requirements of the annual report are subject to any amendments which the Director or the District Manager may authorize or require in writing from time to time.

Closure Plan

27. When it is estimated that there remains only 24 months before waste disposal ceases at the site, the owner shall submit a complete plan for the closure, long term maintenance, long term monitoring and after use of the property to the Regional Director of the Eastern Region.

The reasons for the imposition of the above conditions are as follows:

1. Condition 1 is to clarify the meaning of terms used in this Provisional Certificate of Approval to avoid future misunderstandings.

2. Condition 2 is to make the owner aware that this Provisional Certificate of Approval replaces all previous Provisional Certificates of Approval and Notices of Amendment issued for the site.

3. Condition 3 is to ensure that future owners of the land on which the site is located are made aware of the fact that the land has been used as a landfill or contaminant attenuation zone and that no use may be made of the land for a period of twenty-five years after such use without the approval of the Minister, (EPA, Section 46).

4. Condition 4 is to clearly state that compliance with the conditions on this Certificate does not relieve the owner of the obligation to take all reasonable steps to avoid violating the provisions of other applicable legislation relative to the site.

5. Condition 5 is to make the owner aware that should one of the conditions on the Certificate be found to be invalid it will not invalidate the Certificate or affect the validity of the other conditions on the Certificate.

(6)

6. Condition 6 is to make the owner aware that the conditions of this Certificate will be used to determine the site's compliance with the E.P.A.

7. Condition 7 is to ensure that personnel involved in the management and operation of the site receive instructions about the conditions on this Certificate and the documents in schedule "A", as well as other pertinent information necessary to operate the site in a legal and environmentally safe manner.

8. Condition 8 clearly indicates to the owner that the site is only approved for the disposal of waste from the locations stated in the condition.

9. Condition 9 clearly indicates to the owner that the site is not approved to accept for disposal liquid industrial wastes or hazardous wastes as defined under Regulation 347.

10. Condition 10 makes the owner aware of the Ministry's right to carry out inspections of the site.

11. Condition 11 and 12 is so that the public is aware of the hours of operation of the site and provides pertinent information regarding the use of the site.

12. Conditions 13, 14, 15, 16, 17, 18, 19, 20, 21 and 22 are to ensure that the site is operated in a responsible manner in order to minimize any adverse impacts on the natural environment or the public.

13. Condition 23 is necessary to provide a record of the waste disposed at the site for use in preparing the annual report as well as to monitor the success of any additional waste reduction measures undertaken by the owner to reduce the quantity of waste disposed at the site.

4. Condition 24 is to discourage the illegal dumping of loads which have been refused access to the Site for disposal purposes.

(9)

15. Condition 25 is necessary as the monitoring program is an integral part of the operation and development of the site and should monitoring show an impact or potential impact on or off site, corrective measures may be required and the operation of this site without such conditions may create a hazard to the health and safety of any person and would not be in the public interest.

16. Condition 26 is to provide the Ministry with an annual report on the operation of the site upon which it may make an assessment of the site's performance and compliance with the conditions of this Certificate and if necessary make recommendations for improvements in the site's operation.

17. Condition 27 is to ensure that the site will be closed in an environmentally safe manner.

SCHEDULE "A"

This Schedule "A" forms part of this Provisional Certificate of Approval No. A710121.

1. Letter from Malroz Engineering Incorporated to MOEE dated January 24, 1997 outlining hours of operation of the site.

2. Report entitled "Hydrogeological Study 1996 prepared for The Township of Amherst Island" - February 1996 by Malroz Engineering Incorporated.

3. Report entitled "Waste Disposal Site Development and Operations Plan prepared for The Township of Amherst Island" - February 1996 by Malroz Engineering Incorporated.

4. Report entitled "Capacity Analysis Report" - February 1995 by Kostuch Engineering Limited.

5. Application for Approval of a Waste Disposal Site submitted by the Township of Amherst Island dated May 30, 1996.

6. Letter from Township of Amherst Island dated May 29, 1996 regarding the purchase of lands for attenuation zone and creation of easement for groundwater rights. A copy of the deed and survey are attached.

7. Letter from Malroz Engineering Inc. to MOEE dated March 11, 1997 regarding groundwater and surface water monitoring programs.

You may, by written notice served upon the Director and the Environmental Appeal Board within fifteen (15) days after receipt of this Certificate, require a hearing by the Board. Section 142 of the Environmental Protection Act, R.S.O. 1990 c. E-19 as amended, provides that the notice requiring the hearing shall state:

1. The portions of 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.

In addition to these statutory requirements, the notice should 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 works are located;

and the notice should be signed and dated by the appellant.

PROVISIONAL CERTIF. ATE OF APPROVAL FOR A WASTE DISPOSAL SITE

CERTIFICAT D'AUTORISATION PROVISOIRE DE DÉCHARGE

Provisional Certificate Number A710121
Certificat provisoire no.

This notice should be served upon:

The Secretary
Environmental Appeal Board
112 St. Clair Avenue West
5th Floor
TORONTO, Ontario
M4V 1N3

AND

The Director
Section 39, E.P.A.
Ministry of Environment and Energy
133 Dalton Avenue, Box 820
KINGSTON, Ontario
K7L 4X6

Dated at Kingston this 14 **day of March, 1997.**

Director
Section 39, E.P.A.
Ministry of Environment and Energy

(Pour obtenir une copie du present document en francais, communiquer le Ministère de l'Environnement et de l'Énergie 613 549-4000.)

(13)

Ontario

Ministry of the Environment | Ministère de l'Environnement

RECEIVED NOV 03 2000

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE

NUMBER A710121
Notice No. 1

Totten Sims Hubicki KINGSTON

LOYALIST TOWNSHIP
RECEIVED
OCT 30 2000

WORKS DEPT

FILE:
1) 6930 - Amh Is Lf - Legal
2) Vault File

Corporation of the Township of Loyalist
P.O. Box 70, 263 Main Street
Odessa, Ontario
K0H 2H0

Site Location: Part of Lot 29, Concession 1
Loyalist Township (formerly Township of Amherst Island), County Of Lennox & Addington

You are hereby notified that I have amended Provisional Certificate of Approval No. A710121 issued on March 14, 1997 for the use and operation of 0.8 hectare landfilling site within a total area of 7.93 hectares, as follows:

The preamble has been revoked and replaced with:

for the use and operation of 1.225 hectares landfilling site within a total area of 8.781 hectares

Schedule "A" is hereby amended, by adding:

8. Letter dated August 3, 2000, the attached application dated August 2, 2000 and attachments, for amendment of the original Certificate of Approval No. A710121 from Mr. David Thompson, P.Eng., Township Engineer.

9. The attachments mentioned in section 8 include: 1999 Annual Report for Amherst Island Waste Disposal Site dated May 2000, prepared by Toten Sims Hubicki Associates and letter dated June 19, 2000 from Guy M. Laport, P.Eng., Manager, Kingston Office, Totten Sims Hubicki Associates.

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

1. The reason for this amendment is to correct an error in the area of the site.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A710121 dated March 14, 1997.

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 Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

(.1H)

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 <u>each</u> 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 Appeal Board
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

<u>AND</u>

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 Appeal Board's requirements for an appeal can be obtained directly from the Board at: Tel: (416) 314-4600, Fax: (416) 314-4506 or 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 13th day of October, 2000

Yvonne Hall, P.Eng.
Director
Section 39, *Environmental Protection Act*

BM/

c: District Manager, MOE Kingston - District Office
Guy Laporte, P.Eng., Totten Sims Hubicki Associates Limited
David Thompson, P.Eng, Township Engineer, Township of Loyalist

15

Ontario

Ministry of the Environment | Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A710121
Notice No. 2
Issue Date: November 10, 2006

The Corporation of Loyalist Township
PO Box 70
Odessa, Ontario
K0H 2H0

Site Location: Amherst Island Waste Disposal Site
Lot 29, Concession 1
Loyalist Township, County of Lennox and Addington

You are hereby notified that I have amended Provisional Certificate of Approval No. A710121 issued on March 14, 1997 and amended on October 13, 2000 for the use and operation of 1.225 hectares landfilling site within a total area of 12.982 hectares, as follows:

I. This Notice of Amendment hereby recognizes the addition of 4.201 hectares of contaminant attenuation lands described as Parts 3 and 4 of Plan 29R-7001 to the Amherst Island Waste Disposal Site.

II. The following Condition is hereby added:

Certificate of Requirement

(28) The Site shall be registered on title in accordance with the following sub-conditions:

a. Pursuant to Section 197 of the *EPA*, no person having an interest in the *Site*, including the newly acquired contaminant attenuation lands, shall deal in any way with the *Site* without first giving a copy of this *Certificate* to each person acquiring an interest in the *Site* as a result of the dealing.

b. Two copies of a completed Certificate of Requirement, containing a registerable description of the *Site* (the landfill plus all surrounding buffer lands and contamination attenuation lands), shall be submitted to the *Director* for the *Director*'s signature within 60 calendar days of the date of this *Certificate.*

c. The Certificate of Requirement shall be registered in the appropriate land registry office on title to the *Site* by the *Owner* within 10 calendar days of receiving the

Certificate of Prohibition signed by the *Director*, and a duplicate registered copy shall be submitted to the *Director*.

III. Condition 26 is hereby revoked and replaced with:

(26) An annual monitoring report on the development and operation of the site, including the monitoring programs, shall be submitted to the District Manager by April 30th of the year following the calendar year covered by the report. The report shall include but not be limited to the following information:

(a) delineation of the existing limits of the fill area of the disposal site;
(b) quantity of wastes received and deposited on-site;
(c) remaining site capacity;
(d) conformance with development and operations plan;
(e) operational problems encountered and/or complaints received and the remedial action taken;
(f) monitoring program results, data interpretation and recommendations;
(g) waste deposition locations for the next 12 month period;

The Owner shall notify the Ministry immediately if adverse conditions are found. The requirements of the annual report are subject to any amendments which the Director or the District Manager may authorize or require in writing from time to time.

IV. The following items are hereby added to Schedule "A":

(10) Application for a Provisional Certificate of Approval for a Waste Disposal Site dated February 7, 2000, including all attached supporting documentation.

The reason for this amendment to the Certificate of Approval is as follows:

To recognize the addition of a contaminant attenuation zone to the site and to ensure that the property is registered on title.

To approve the Owner's request to change the submission date for the Annual Report required under Condition 26 of this Certificate.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A710121 dated March 14, 1997, as amended.

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
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

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**

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

DATED AT TORONTO this 10th day of November, 2006

THIS NOTICE WAS MAILED
ON NOV-16, 2006
9C
(Signed)

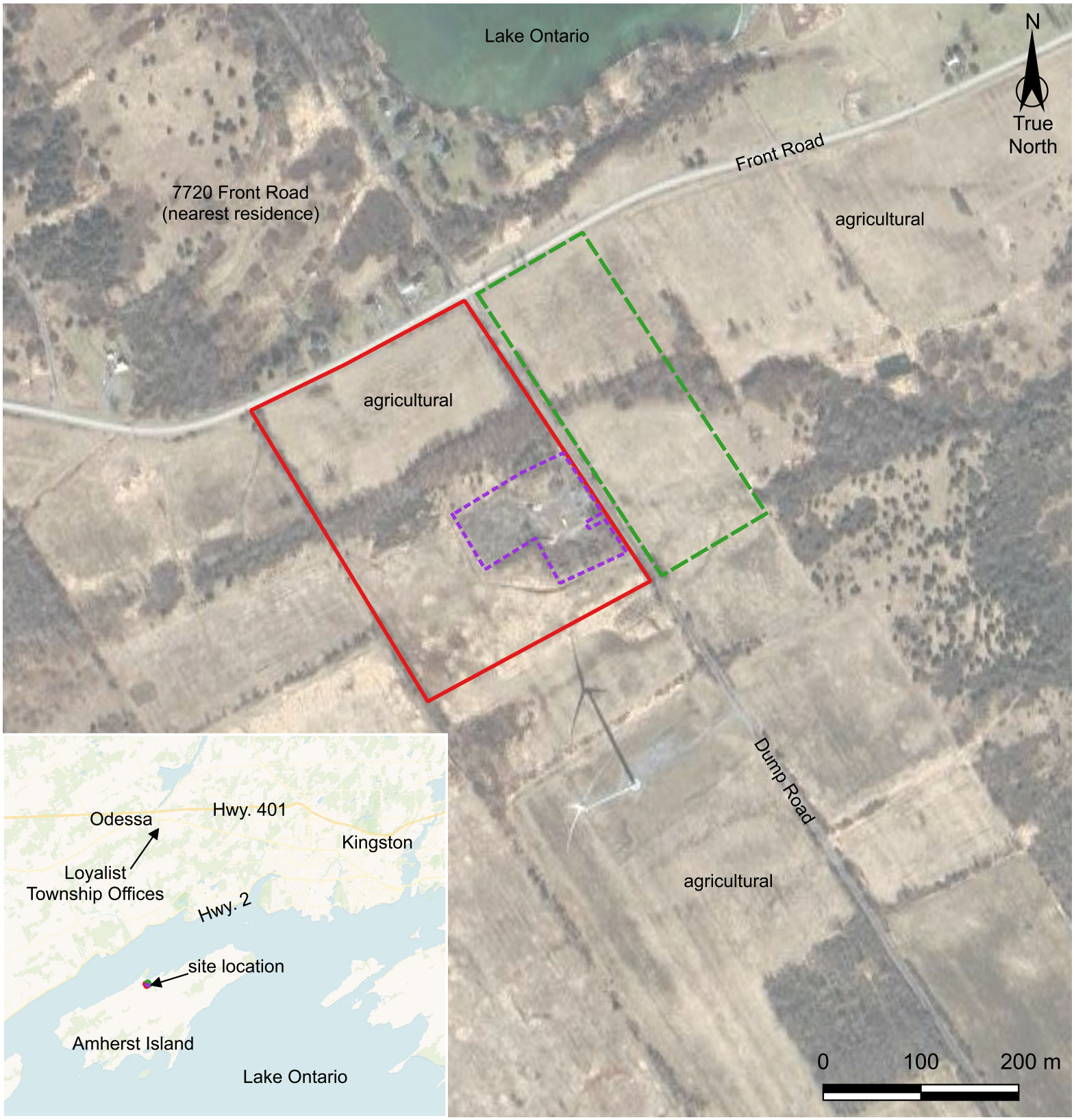
Tes. Gebrezghi

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

DL/

c: District Manager, MOE Kingston - District
David C. Thompson, P.Eng., The Corporation of Loyalist Township ✓

Appendix B
Figures



Legend

- approximate property boundary
- approximate contaminant attenuation zone
- approximate licensed fill area

Rev	Date	Description	By	Chkd
R0	2025-04-29	issued in final	TV	RF

Site Location Plan

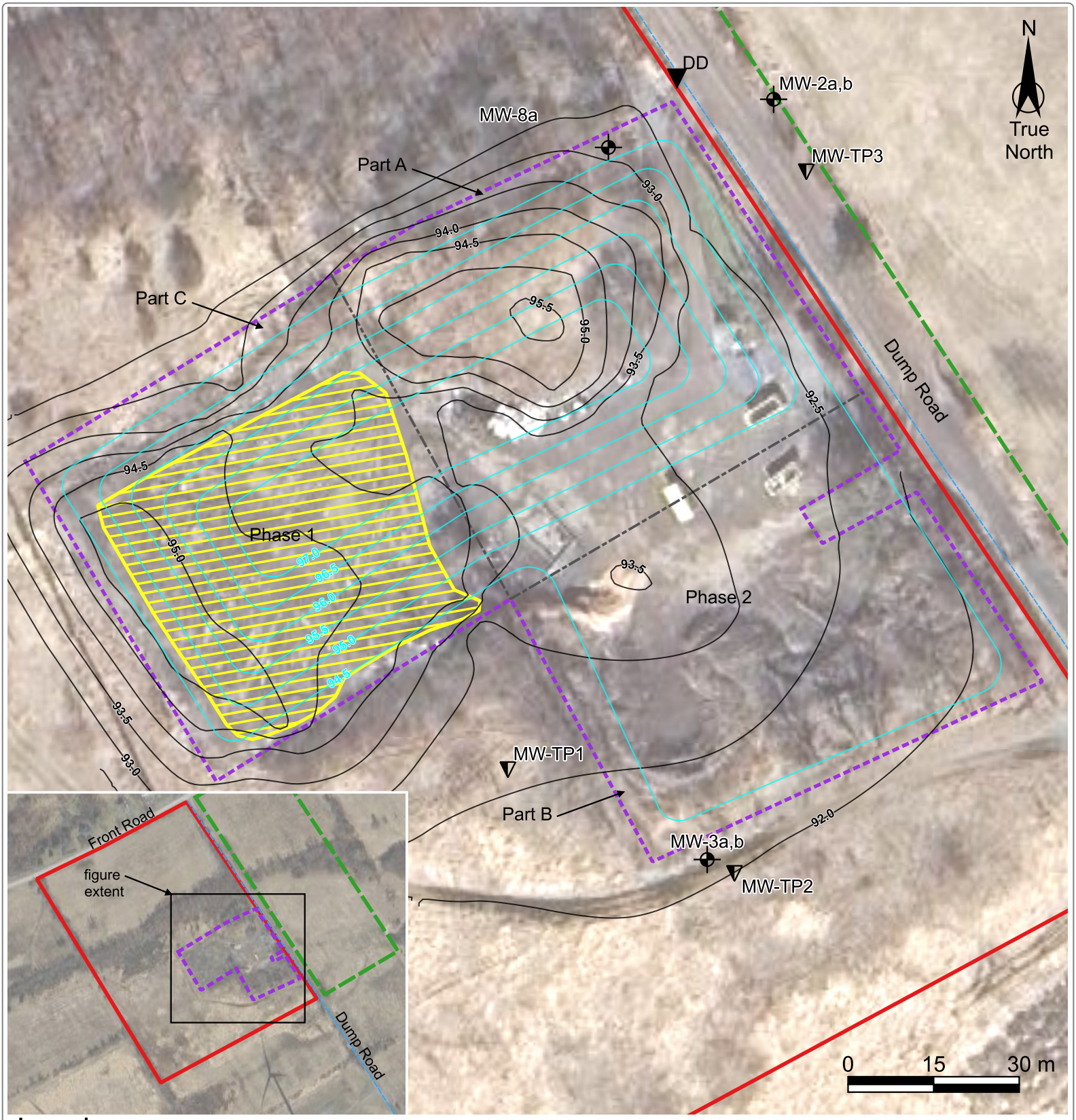
2024 Annual Development, Operations, and Monitoring Report
Amherst Island Waste Disposal Site
145 Dump Road, Loyalist Township, Ontario

File: 061-231.00

Figure 1

MALROZ

Data Sources: Figure based on Malroz field observations and Google Earth imagery.



Legend

- approximate property boundary
- approximate contaminant attenuation zone (groundwater rights only)
- approximate licensed fill area
- approximate active fill area
- waste elevation contours surveyed January 14, 2025 (0.5 m intervals)
- proposed final contours
- extent of landfill parts
- intermittent watercourse (drainage ditch)
- monitoring well location
- test pit piezometer location
- surface water sampling location

Data Sources: Figure based on Malroz field observations and Google Earth imagery. Proposed final contours based on Malroz field observations and AECOM figure 60505403-2.DWG.

Rev	Date	Description	By	Chkd
R0	2025-04-29	issued in final	TV	RF

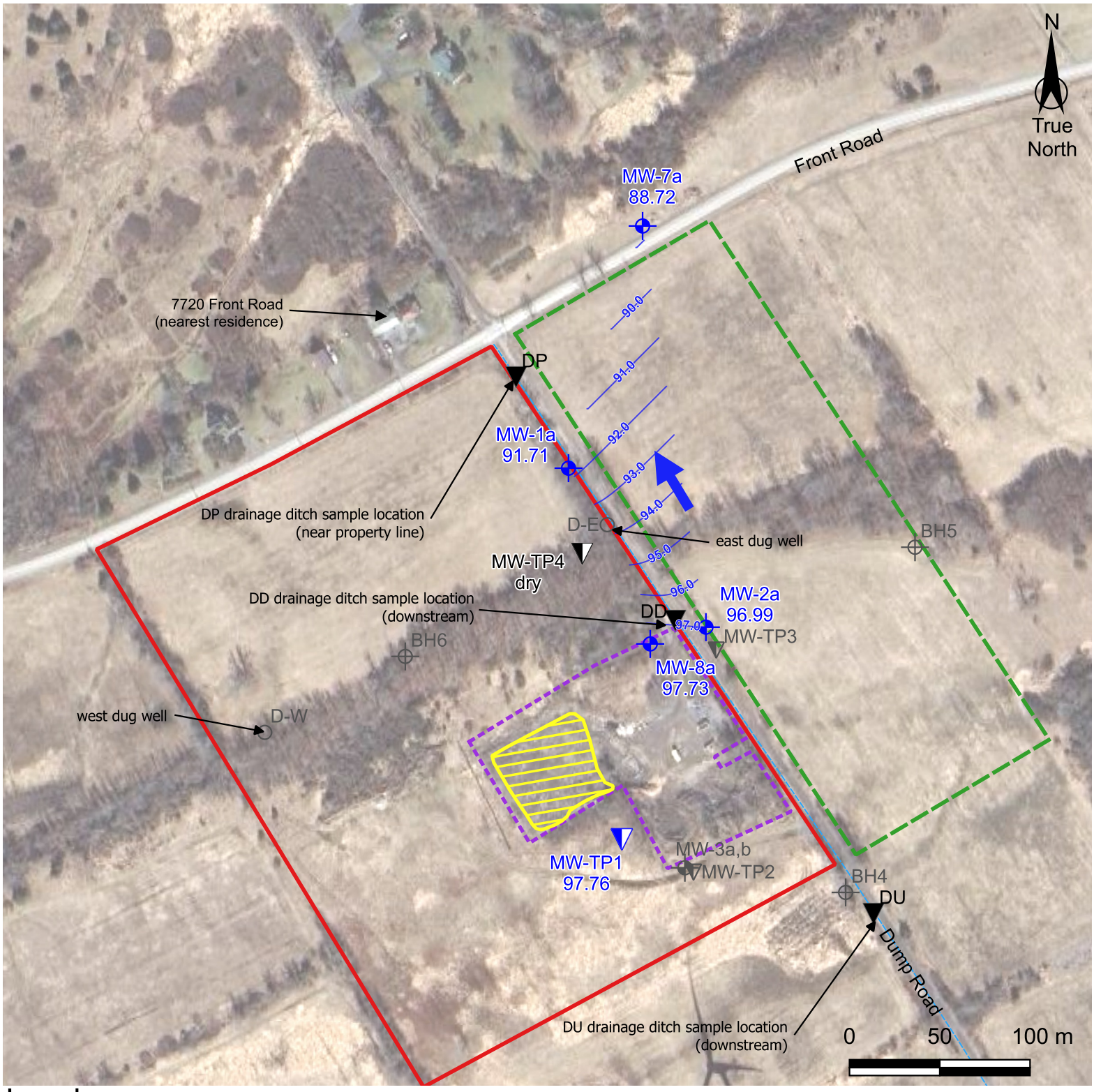
2024 Waste Pile Contours

2024 Annual Development, Operations, and Monitoring Report
Amherst Island Waste Disposal Site
145 Dump Road, Loyalist Township, Ontario

File: 061-231.00

Figure 2

MALROZ



Legend

- approximate property boundary
- contaminant attenuation zone (groundwater rights only)
- approximate licensed fill area
- approximate active fill area
- intermittent water course (drainage ditch)
- inferred shallow groundwater contours (1.0 m intervals)
- inferred groundwater flow direction
- MW-8a 97.49 — monitoring well location and groundwater elevation
- test pit piezometer not used in groundwater contour inference due to low water conditions
- monitoring well, test pit piezometer, and/or open borehole not used in groundwater contour inference
- surface water sample station

Data Sources: Figure based on Malroz field observations and Google Earth imagery.

Rev	Date	Description	By	Chkd
R0	2025-04-29	issued in final	TV	RF

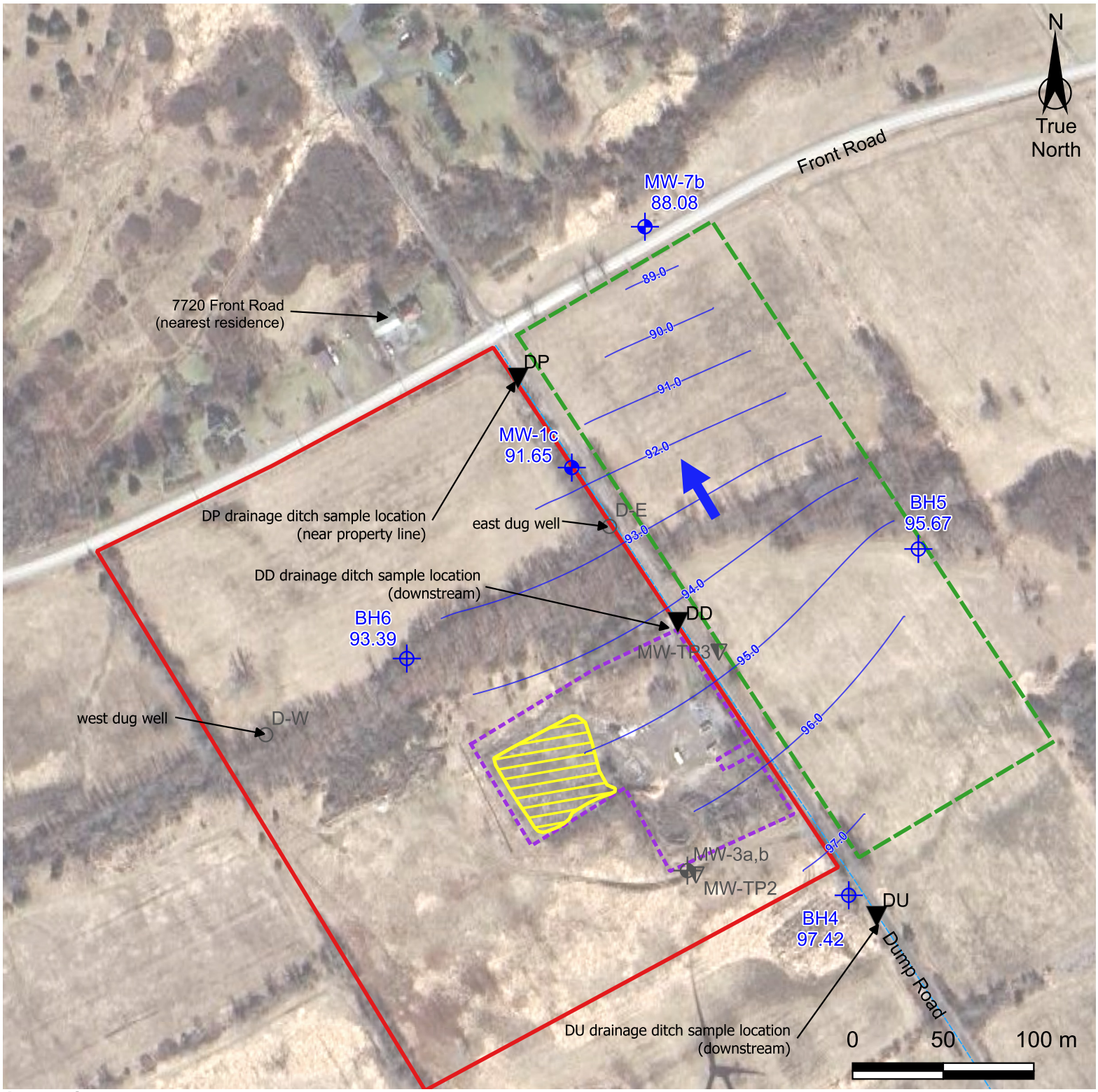
Shallow Groundwater Contours (May 31, 2024)

2024 Annual Development, Operations, and Monitoring Report
Amherst Island Waste Disposal Site
145 Dump Road, Loyalist Township, Ontario

File: 061-231.00

Figure 3

MALROZ



Legend

- approximate property boundary
- contaminant attenuation zone (groundwater rights only)
- approximate licensed fill area
- approximate active fill area
- intermittent water course (drainage ditch)
- inferred deep groundwater contours (1.0 m intervals)
- inferred groundwater flow direction
- MW-8a 97.49 — monitoring well location and groundwater elevation
- BH4 97.42 — open borehole location and groundwater elevation
- monitoring well, test pit piezometer, and/or open borehole not used in groundwater contour inference
- surface water sample station

Data Sources: Figure based on Malroz field observations and Google Earth imagery.

Rev	Date	Description	By	Chkd
R0	2025-04-29	issued in final	TV	RF

Deep Groundwater Contours (May 31, 2024)

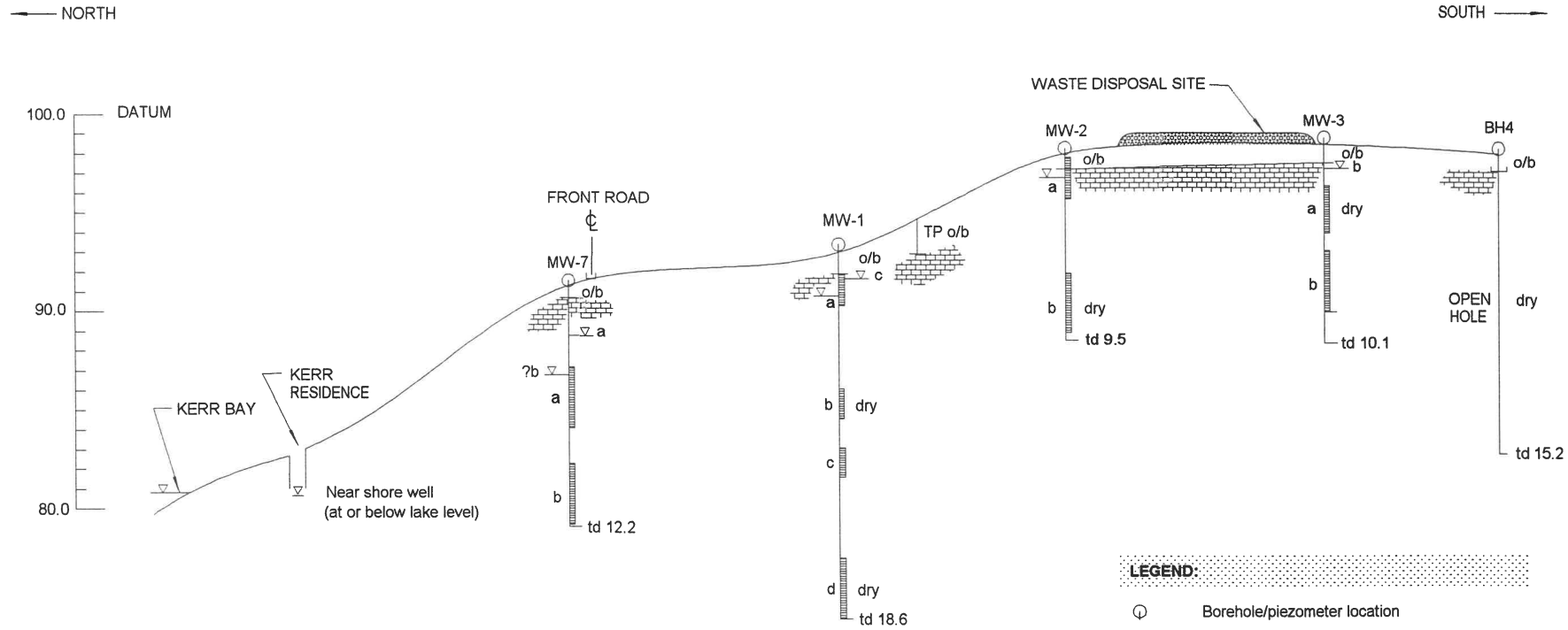
2024 Annual Development, Operations, and Monitoring Report
Amherst Island Waste Disposal Site
145 Dump Road, Loyalist Township, Ontario

File: 061-231.00

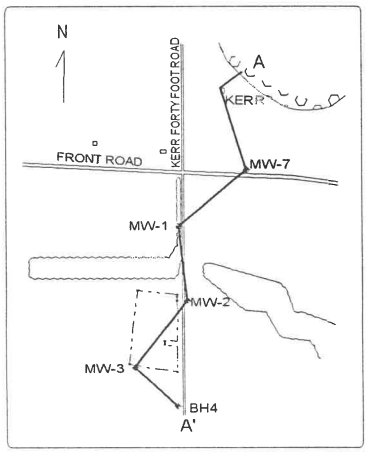
Figure 4

MALROZ

Appendix C
Cross-Section and Borehole Logs



KEY DIAGRAM



APPROX. HORIZONTAL SCALE

0 100 m

Notes: Elevations in metres, referenced to field established benchmark

LEGEND:

	Borehole/piezometer location
	Ground surface/geological contact (approximate)
o/b	Overburden (silty clay)
	Limestone
a	Screened section with piezometer ID.
b	Standing water elevation for specified piezometer
dry	Denotes dry, tight hydraulic conditions, insignificant recharge observed
td	Total depth (termination) in metres below collar

MALROZ

Project:	TOWNSHIP OF AMHERST ISLAND: HYDROGOLOGICAL STUDY, 1996					
Title:	GEOLOGIC SECTION A - A'					
Designed: JM	Drawn: BR	Verified:	Date: 96/02	File: 061/103-R04	Figure: 7	

Table A-1

Borehole Logs, Hydrogeological Study, Township of Amherst Island

BOREHOLE	DEPTH[1] (m)	DESCRIPTION[2]	REMARKS
BH4	0.0 - 0.6	OVERBURDEN - clay, dry	DRILL - drilled with tire mounted rotary rig (0.0 to 6.4 m) and cable tool rig (6.4 to 15.2 m), - 15.25 cm diam. hole, casing and annular cement grout set from surface to depth of 0.9 m - borehole completed 93-09-09
	0.6 - 15.2	LIMESTONE - cuttings grey - softer 4.6 m to 6.4 m, cuttings exhibit darker colour	PIEZOMETER - open hole, no piezometer screens installed GROUNDWATER[3] - no water inflow into open hole observed
	15.2	END BOREHOLE	ELEVATIONS[4] - top of steel casing @ 98.190 m - ground elevation @ 97.928 m
BH5	0.0 - 0.5	OVERBURDEN - clay	DRILL - drilled with tire mounted rotary rig (0.0 m to 6.1 m) and cable tool rig (6.1 m to 15.2 m), - 15.25 cm diam. hole, casing and annular cement grout set from surface to depth of 1.0 m - borehole completed 93-09-10
	0.5 - 15.2	LIMESTONE - cuttings grey - shale partings 0.5 m to 0.9 m	PIEZOMETER - open hole, no piezometer screens installed GROUNDWATER[3] - no water inflow into open hole observed
	15.2	END BOREHOLE	ELEVATIONS[4] - top of steel casing @ 97.733 m - ground elevation @ 97.151 m

Note: Boreholes BH1, BH2 and BH3 were drilled in 1990 and 1991. Borehole logs were presented in preliminary hydrogeological report (Malroz File: 061/0R01, dated March, 1991)

Continued ....

Table A-1

Borehole Logs, Hydrogeological Study, Township of Amherst Island

BOREHOLE	DEPTH[1] (m)	DESCRIPTION[2]	REMARKS
BH6	0.0 - 0.8	OVERBURDEN - clay with some silt and sand	DRILL - drilled with tire mounted rotary rig (0.0 m to 6.4 m) and cable tool rig (6.4 m to 12.2 m), - 15.25 cm diam. hole, casing and annular cement grout set from surface to depth of 6.0 m - borehole completed 93-09-13
	0.8 - 12.2	LIMESTONE - cuttings grey - shale interbeds 0.9 m to 1.2 m	PIEZOMETER - open hole, no piezometer screens installed GROUNDWATER[3] - no water inflow into open hole observed
	12.2	END BOREHOLE	ELEVATIONS[4] - top of steel casing @ 95.811 m - ground elevation @ 95.588 m
BH7	0.0 - 0.6	OVERBURDEN - sand with rock rubble, some wood and metallic debris	DRILL - drilled with tire mounted rotary rig (0.0 m to 9.1 m) and cable tool rig (9.1 m to 12.2 m), - 15.25 cm diam. hole, casing set to 3.0 m, annular cement grout set from surface to depth of 0.9 m - borehole completed 93-09-13
	0.6 - 12.2	LIMESTONE - cuttings grey to brown, weathered shale interbeds 0.3 m to 2.4 m, extremely soft with some unconsolidated material, cuttings locally dark - grey shale interbeds 2.4 m to 7.6 m, soft, borehole walls exhibit caving - minor caving to 7.6 m, rock competent 7.6 to 12.2 m	PIEZOMETER - piezometer screens installed MW-7a 4.1 to 7.2 m MW-7b 9.0 to 12.0 m GROUNDWATER[3] - water inflow detected between 4.1 m and 6.7 m at 15 litres per minute, stabilized at 4.3 m
	12.2	END BOREHOLE	ELEVATIONS[4] - top of piezometer MW-7a @ 91.550, top of piezometer MW-7b @ 91.561 m - ground elevation @ 91.310

Continued ....

Table A-1

Borehole Logs, Hydrogeological Study, Township of Amherst Island

BOREHOLE	DEPTH[1] (m)	DESCRIPTION[2]	REMARKS
BH8	0.0 - 1.5	OVERBURDEN - sand with some silt, clay and minor metallic debris	DRILL - drilled with tire mounted rotary rig (0.0 to 9.1 m) - 15.25 cm diam. hole, protective casing set to 0.9 m, annular cement grout set from surface to depth of 0.9 m - borehole completed 93-09-09
	1.5 - 6.1	LIMESTONE - cuttings grey - no shale interbeds detected	GROUNDWATER[3] - very slow water inflow into open borehole was detected, stabilized slowly to 1.2 m PIEZOMETER - piezometer screen installed MW-8a 1.2 to 4.3 m
	6.1	END BOREHOLE	ELEVATIONS[4] - top of piezometer MW-8a @ 99.828 m - ground elevation @ 99.278 m

Notes: (1) Depths are reported in metres below existing grade, sub-intervals are enclosed in parentheses.
(2) Description based on Malroz field observations of cuttings and drillers' logs.
(3) Remarks concerning depth to water and inflow based on Malroz field observations and drillers' logs.
(4) Elevation in metres relative to temporary field bench mark.

Appendix D
Tables

Table 1
Groundwater Program

Tasks	Location	Analyses
Tier 1 i. measure standing water elevation ii. measure combustible vapours in wells iii. examine water for impact (i.e. discolouration, NAPL) iv. measure pH, EC, temperature	MW-1a, MW-2a, MW-7a, MW-8a, MW-TP1, MW-TP2, MW-TP3, MW-TP4, dug wells D-E, D-W	temperature (field), pH (field), EC (field), ORP (field), turbidity (field)
Tier 2 v. purge and sample each location vi. submit samples for analyses	MW-1a, MW-2a, MW-7a, MW-8a, MW-TP4	Schedule 5, Column 2 (landfill standards): alkalinity, ammonia, barium, boron, calcium, COD, chloride, conductivity, DOC, iron, magnesium, nitrate, pH, sodium, sulphate, TDS temperature (field), pH (field), EC (field), ORP (field), turbidity (field), DO (field) Plus: manganese, TKN, potassium and hardness, un-ionized ammonia (calculated using field pH and temperature and laboratory ammonia value).

Table 2
2024 Summary of Field Monitoring Results

Monitoring Well ID.	Sample Date	Depth to Water [1]	TOP Elev (m)	Groundwater Elevation [2] (m)	Methane Concentration [3] (% LEL)	Observations		
						Colour	Odour	Sediment
MW-ERN-001	2024-05-23	0.81	84.50	83.69	nr	brown	slight sulphur	abundant
	2024-08-21	1.45	84.50	83.05	nr	tannic	sulphur	some
MW-ERN-003 [4]	2024-05-23	artesian	-	-	-	clear	none	trace
	2024-08-21	artesian	-	-	-	clear	none	none
MW-ERN-005 [4]	2024-05-23	artesian	-	-	-	clear	none	trace
	2024-08-21	artesian	-	-	-	clear	none	none
MW-ERN-006	2024-05-23	0.29	83.75	83.46	6	black	sulphur	abundant
	2024-08-21	0.36	83.75	83.39	nr	cloudy black	none	some
MW-ERN-101	2024-05-23	dry	100.46	dry	nr	no observations made		
	2024-08-21	dry	100.46	dry	nr	no observations made		
MW-ERN-102	2024-05-23	3.66	98.37	94.71	nr	tannic	none	trace
	2024-08-21	4.20	98.37	94.17	<1	clear	none	none
MW-ERN-104(1)	2024-05-23	2.33	83.55	81.22	nr	cloudy	slight sulphur	some
	2024-08-21	2.32	83.55	81.23	nr	slightly tanic	sulphur	trace
MW-ERN-105(2)	2024-05-23	1.42	84.26	82.84	<1	cloudy	sulphur	trace
	2024-08-21	1.57	84.26	82.69	nr	tannic	sulphur	some
MW-ERN-106(2)	2024-05-23	2.55	84.96	82.41	nr	slightly cloudy	slight sulphur	trace
	2024-08-21	2.62	84.96	82.34	nr	clear	none	trace
MW-ERN-109	2024-05-23	1.74	83.95	82.21	nr	clear	slight sulphur	trace
	2024-08-21	1.82	83.95	82.13	nr	clear	none	none
MW-ERN-110	2024-05-23	4.33	86.73	82.40	nr	clear	none	trace
	2024-08-21	4.45	86.73	82.28	nr	tannic	sulphur	some
MW-ERN-112	2024-05-23	11.89	94.24	82.35	>100	clear	sulphur	trace
	2024-08-21	11.95	94.24	82.29	>100	cloudy grey	sulphur	some

Data Input: SG
Data Check: RF

Notes:

-	denotes not applicable/available
nr	denotes no response
m	denotes metres
% LEL	denotes percentage of lower explosive limits
TOP	denotes top of piezometer
[1]	depth to water readings taken from top of piezometer
[2]	groundwater elevations calculated using AECOM survey data, top of piezometer elevation, water level data table
[3]	methane concentration in %LEL calculated as difference between full gas response concentration and methane eliminated concentration
[4]	artesian well (capped with modified well hydrant in July 1999)

Table 3
2024 Groundwater Monitoring Results

Monitoring Well ID	Date	Depth to Water [1] (mbTOP)	Groundwater Elevation (m)	Methane Concentrations [2] (%LEL)	Observations (colour, odour, sediment)
MW-1a	2024-05-31	1.66	91.71	nr	slightly cloudy, no odour, trace sediments
	2024-11-25	dry	-	nr	-
MW-1b	2024-05-31	7.71	-	nr	visual and olfactory characteristics not monitored
	2024-11-25	7.55	-	nr	visual and olfactory characteristics not monitored
MW-1c	2024-05-31	1.66	91.65	nr	visual and olfactory characteristics not monitored
	2024-11-25	1.40	91.91	nr	visual and olfactory characteristics not monitored
MW-1d	2024-05-31	6.50	-	nr	visual and olfactory characteristics not monitored
	2024-11-25	6.42	-	nr	visual and olfactory characteristics not monitored
MW-2a	2024-05-31	1.17	96.99	nr	cloudy brown, no odour, some sediments
	2024-11-25	1.11	97.05	nr	cloudy yellow, no odour, some sediments
MW-2b	2024-05-31	7.85	84.04	nr	visual and olfactory characteristics not monitored
	2024-11-25	7.80	84.09	<1	visual and olfactory characteristics not monitored
MW-3a	2024-05-31	0.41	-	<1	visual and olfactory characteristics not monitored
	2024-11-25	0.31	-	<1	visual and olfactory characteristics not monitored
MW-3b	2024-05-31	0.30	-	<1	visual and olfactory characteristics not monitored
	2024-11-25	0.25	-	nr	visual and olfactory characteristics not monitored
MW-7a	2024-05-31	2.83	88.72	nr	cloudy, no odour, no sediments
	2024-11-25	2.70	88.85	nr	clear, no odour, no sediments
MW-7b	2024-05-31	3.48	88.08	nr	visual and olfactory characteristics not monitored
	2024-11-25	4.00	87.56	nr	visual and olfactory characteristics not monitored
MW-8a	2024-05-31	2.10	97.73	nr	cloudy brown, musty odour, some sediments
	2024-11-25	2.66	97.17	nr	cloudy yellow, no odour, some sediments
MW-TP1	2024-05-31	1.35	97.76	nr	visual and olfactory characteristics not monitored
	2024-11-25	dry	-	nr	-
MW-TP2	2024-05-31	1.48	97.74	nr	visual and olfactory characteristics not monitored
	2024-11-25	dry	-	nr	-
MW-TP3	2024-05-31	dry	-	nr	-
	2024-11-25	dry	-	<1	-
MW-TP4	2024-05-31	dry	-	nr	-
	2024-11-25	dry	-	nr	-
BH4	2024-05-31	0.77	97.42	nr	visual and olfactory characteristics not monitored
	2024-11-25	0.88	97.31	nr	visual and olfactory characteristics not monitored
BH5	2024-05-31	2.06	95.67	nr	visual and olfactory characteristics not monitored
	2024-11-25	2.23	95.50	nr	visual and olfactory characteristics not monitored
BH6	2024-05-31	2.42	93.39	nr	visual and olfactory characteristics not monitored
	2024-11-25	2.44	93.37	<1	visual and olfactory characteristics not monitored

Notes:
[1] depth to water readings measured from top of piezometer.
[2] methane concentrations calculated as difference between full gas response concentration and methane eliminated concentration.
mbTOP metres below top of piezometer
nr no response
%LEL percent of lower explosive limit
- not available/not applicable

Data Input: TV
Data Check: RF

Table 4
2024 Groundwater Chemistry Data

Parameter	Units	Well ID	Trigger Well	Downgradient		Background	Leachate	Trigger Well	Downgradient		Background	Leachate	ODWS		Reasonable Use Policy
		Sample ID	MW-1a	MW-2a	MW-TP4	MW-7a	MW-8a	MW-1a	MW-2a	MW-TP4	MW-7a	MW-8a			
			24-W004	24-W002	-	24-W005	24-W003	-	24-W006	-	24-W008	24-W007			
		R.L.	2024-05-31					2024-11-25					Value	Type	
Conductivity	umho/cm	1	943	784		677	1650		1090		818	1740			
Alkalinity as CaCO3	mg/L	5	321	252		274	713		272		295	765	30-500	OG	
Hardness as CaCO3	mg/L	0.02	403	378		312	742		476		364	792	80-100	OG	
Ammonia-N	mg/L	0.05	<	<		<	1.72		0.06		<	1.46			
Potassium	mg/L	0.1	1.1	1.7		1.2	17.5		3.6		1.8	21.3			
Sodium	mg/L	0.2	37.2	9.8		18.7	38.6		14.0		21.4	69.5	200	AO	110
Chloride	mg/L	0.5	80.1	93.2		38.3	49.3		161		67.4	64.5	250	AO	141
Nitrate-N	mg/L	0.05	<	<		0.10	5.74		0.53		<	<	10.0	CS	
Sulphate	mg/L	1	59	10		24	135		30		25	115	500	AO	
Barium	mg/L	0.001	0.055	0.119		0.039	0.149		0.174		0.050	0.184	1.0	CS	
Boron	mg/L	0.005	0.190	0.026		0.053	0.710		0.057		0.062	0.890	5.0	CS	1.29
Calcium	mg/L	0.02	141	128		105	234		157		116	240			
Iron	mg/L	0.005	0.005	0.028	dry conditions	<	0.028	dry conditions	<	dry conditions	0.051	0.686	0.3	AO	0.16
Magnesium	mg/L	0.02	12.2	14.1		12.1	38.3		20.3		18.0	46.8			
Manganese	mg/L	0.001	0.002	0.102		<	0.055		<		0.005	0.352	0.05	AO	
Dissolved Organic Carbon	mg/L	0.2	4.2	3.1		2.5	9.1		2.2		2.5	6.6	5	AO	
Total Dissolved Solids	mg/L	3	501	411		352	905		586		430	956	500	AO	465
Total Kjeldahl Nitrogen-N	mg/L	0.1	0.4	0.4		0.2	3.1		0.5		0.4	2.5			
Chemical Oxygen Demand	mg/L	5	21	20		10	52		31		21	54			
pH	pH units	-	7.75	7.80		7.79	7.72		7.64		7.66	7.45	6.5-8.5	OG	
pH (Field)	pH units	-	6.97	6.83		6.94	6.71		6.90		6.84	6.99	6.5-8.5	OG	
Conductivity (Field)	mS/cm	-	0.808	0.857		0.653	1.46		1.40		0.825	1.71			
Turbidity (Field)	NTU	-	170	206		101	258		176		40.0	100			
ORP (Field)	mV	-	151	122		166	158		214		114	53			
Temperature (Field)	°C	-	18.25	17.14		11.01	12.67		7.93		11.06	10.78	15	AO	
Dissolved Oxygen (Field)	mg/L	-	4.50	2.88		3.12	4.01		3.66		1.60	2.03			
Un-ionized Ammonia (Calculated)	mg/L	0.001	<	<		<	0.002		<		<	0.003			

Data Input: TV
Data Check: RF

Notes:

"-" not applicable
"R.L." denotes laboratory reporting limit
"<" results below reporting limit
"MW-##" groundwater monitoring well ID
groundwater samples analyzed for metals were field filtered using 0.45 micron filters

parameters exceeding Ontario Drinking Water Quality Standards (ODWS, 2018)
"AO" aesthetic objective "OG" operational guideline "CS" chemical standard
parameter exceeds Reasonable Use Policy criteria

Table 5
Statistical Summary of Historical Groundwater Chemistry (Current as of 2024)

		MW-1a						MW-2a						MW-7a						Ontario Drinking Water Standards (MOE, June 2006)
Parameter	Units	Median	Max	Date of Max	Min	Date of Min	# Events	Median	Max	Date of Max	Min	Date of Min	# Events	Median	Max	Date of Max	Min	Date of Min	# Events	
Conductivity	uS/cm	676	1410	2020-11-11	484	2011-04-14	45	1065	2140	2018-10-31	421	2019-11-07	58	680.5	890	2023-11-28	457	2017-11-02	56	
Colour	TCU	6	18	2002-11-27	<	-	16	13	20	2001-11-29	6	1990-12-01	26	2	46	2001-11-29	<	-	25	5 AO
Alkalinity as CaCO3	mg/L	230	336	2012-11-21	157	2002-11-27	45	398	951	2018-10-31	188	2023-11-28	58	271.5	377	2000-11-30	200	2017-11-02	56	30-500 OG
Hardness as CaCO3	mg/L	316	616	2020-11-11	225	2014-05-08	40	402	924	2018-10-31	199	1990-12-01	53	326	408	1998-11-04	214	2017-11-02	51	80-100 OG
Ammonia-N	mg/L	0.03	0.14	2004-04-28	<	-	45	3.24	18.2	2001-04-25	<	-	57	0.02	0.35	1993-12-16	<	-	55	
Potassium	mg/L	1.78	9.8	1993-12-16	<	-	42	13.2	48	2008-10-29	1	2001-11-29	55	2	48	2001-11-29	<	-	53	
Sodium	mg/L	24	59.5	2020-11-11	9	2002-04-17	45	31.0	155	2018-10-31	3.8	2019-06-05	58	17.1	30.2	2023-11-28	7.5	2018-10-31	56	200 AO
Chloride	mg/L	43.8	213	2020-11-11	10.4	2014-05-08	45	50.5	389	2023-11-28	1	2017-06-07	58	30.8	88.3	2023-11-28	4.7	2018-10-31	56	250 AO
Nitrate-N	mg/L	<	3.61	2006-11-02	<	-	44	0.4	7.91	2001-11-29	<	-	56	0.35	13.4	2003-11-19	<	-	55	10.0 CS
Sulphate	mg/L	47	258	1993-12-16	21.0	2019-06-05	45	50.5	202	1990-12-01	3	28-May-20	58	35.5	70.5	1995-12-19	12	2017-11-02	56	500 AO
Barium	mg/L	0.04	0.086	2020-11-11	0.02	2011-04-14	28	0.121	0.375	1995-12-19	0.06	2017-11-02	32	0.044	0.132	2018-10-31	0.033	2017-11-02	31	1 CS
Boron	mg/L	0.10	0.22	2018-06-06	<	-	28	0.0725	1.04	2013-05-10	0.02	2023-05-18	32	0.049	0.097	1995-12-19	<	-	31	5 CS
Calcium	mg/L	110	215	2020-11-11	64.3	2009-11-30	38	111	284	2018-10-31	59.3	2009-11-30	45	100	132	2000-11-30	60.9	2009-11-30	43	
Iron	mg/L	0.051	33.7	2005-04-20	<	-	45	1.36	46.4	2005-04-20	<	-	58	<	18.3	2005-11-02	<	-	56	0.3 AO
Magnesium	mg/L	10	26.6	1993-12-16	5.74	2011-04-14	38	17.2	58	2013-05-10	<	-	45	14.1	25	2001-11-29	8.5	2017-11-02	43	
Manganese	mg/L	0.02	0.82	1990-12-01	<	-	26	0.067	62	2011-04-14	<	-	31	<	0.036	1993-10-27	<	-	29	0.05 AO
Total Kjeldahl Nitrogen-N	mg/L	0.6	1.6	2019-06-05	0.2	2017-06-07	25	1	12.8	2012-11-21	0.2	2017-06-07	29	0.3	0.9	2021-05-27	<	-	28	
Total Organic Carbon	mg/L	3.7	7.1	2002-04-17	2.2	2005-04-20	17	12.3	23.1	2001-04-25	2.2	1990-12-01	27	2	3.1	2008-10-29	1.4	1993-10-27	25	
Total Dissolved Solids	mg/L	387	765	2020-11-11	276.000	2014-05-08	44	620	1180	2018-10-31	217	2019-11-07	54	436.5	535	2006-05-09	251	2017-11-02	53	500 AO
Chemical Oxygen Demand	mg/L	20.5	110	2015-11-06	<	-	40	28	78	2010-04-20	<	-	49	6	107	2010-04-20	<	-	49	
Biochemical Oxygen Demand	mg/L	<	6	2015-11-06	<	-	15	5.5	20	2004-04-28	<	-	20	<	5	2000-04-24	<	-	21	
Benzene	µg/L	<	<	-	<	-	8	<	<	-	<	-	9	<	<	-	<	-	10	1 CS
Toluene	µg/L	<	<	-	<	-	8	<	<	-	<	-	9	<	<	-	<	-	10	60 CS
Ethylbenzene	µg/L	<	<	-	<	-	8	<	<	-	<	-	9	<	<	-	<	-	9	140 CS
Total Xylenes	µg/L	<	<	-	<	-	8	<	<	-	<	-	9	<	<	-	<	-	10	90 CS
pH	pH units	7.69	8.11	2021-05-27	7.1	2011-11-28	44	7.60	8.15	2000-04-24	6.9	2011-11-28	54	7.71	8.22	2000-04-24	7	2011-11-28	51	6.5 - 8.5 OG

		MW-8a						MW-TP1						MW-TP4						Ontario Drinking Water Standards (MOE, June 2006)
Parameter	Units	Median	Max	Date of Max	Min	Date of Min	# Events	Median	Max	Date of Max	Min	Date of Min	# Events	Median	Max	Date of Max	Min	Date of Min	# Events	
Conductivity	uS/cm	1740	2310	2017-11-02	778	2018-10-31	58	540	654	1995-12-19	466	2006-11-02	6	665.5	860	2012-11-21	403	2017-11-02	38	
Colour	TCU	11	22	2008-10-29	7	1993-10-27	25	11.5	67	2008-10-29	4	2006-05-09	6	3	6	2004-11-25	<	-	19	5 AO
Alkalinity as CaCO3	mg/L	735.5	1390	2002-04-17	309	2018-10-31	58	269.5	320	2006-05-09	238	2008-04-30	6	255	339	2013-05-10	144	2002-11-27	38	30-500 OG
Hardness as CaCO3	mg/L	809	1030	2003-04-25	359	2018-10-31	53	256	295	2006-05-09	21.4	1995-12-19	6	340	653	2013-05-10	173	2017-11-02	33	80-100 OG
Ammonia-N	mg/L	0.62	16.3	2019-11-07	<	-	57	0.135	0.7	2008-10-29	<	-	6	0.03	0.41	2010-11-26	<	-	37	
Potassium	mg/L	24.3	47	2003-11-19	2	2001-11-29	55	<	10	2008-10-29	<	-	6	<	10	2008-04-30	<	-	35	
Sodium	mg/L	85.65	216	2005-04-20	23	2023-05-18	58	10	14	2008-04-30	8	2006-05-09	6	19	38.7	2013-05-10	7	2000-04-24	38	200 AO
Chloride	mg/L	63.75	229	2016-05-03	17	2013-05-10	58	5	40.8	1995-12-19	3	2006-11-02	6	26.5	126	2009-11-30	6	2000-04-24	38	250 AO
Nitrate-N	mg/L	4.83	26.8	2014-05-08	<	-	57	0.32	2.1	1995-12-19	0.11	2006-11-02	6	<	4.67	2002-04-17	<	-	37	10.0 CS
Sulphate	mg/L	155	292	2003-04-25	<	-	58	6	36.4	1995-12-19	3	2007-04-30	6	53	121	2000-11-30	<	-	38	500 AO
Barium	mg/L	0.178	0.296	2017-11-02	0.053	2018-10-31	33	0.139	0.139	1995-12-19	0.139	1995-12-19	1	0.0385	0.046	2012-11-21	0.022	2017-11-02	18	1 CS
Boron	mg/L	0.937	1.46	2009-11-30	0.063	2018-10-31	33	0.094	0.094	1995-12-19	0.094	1995-12-19	1	0.1455	0.26	2013-05-10	0.068	2009-04-21	18	5 CS
Calcium	mg/L	236.5	325	2003-04-25	111.8	1993-12-16	44	40.64	75	2008-10-29	6.28	1995-12-19	2	108	244	2013-05-10	<	-	27	
Iron	mg/L	0.155	16.8	1993-12-16	0.005	2014-05-08	58	0.035	125	2006-05-09	<	-	6	0.0025	15.8	2005-04-20	<	-	38	0.3 AO
Magnesium	mg/L	45.1	71	2002-11-27	17.4	2018-10-31	45	7.7	14	2008-10-29	1.4	1995-12-19	2	8.64	15	2000-11-30	5.27	2017-11-02	25	
Manganese	mg/L	0.171	0.873	2015-11-06	<	-	31	0.036	0.036	1995-12-19	0.036	1995-12-19	1	<	0.007	1995-12-19	<	-	15	0.05 AO
Total Kjeldahl Nitrogen-N	mg/L	2.25	17.7	2019-11-07	0.4	2014-05-08	30	-	-	-	-	-	1	0.65	8.6	2011-04-14	0.2	2017-11-02	17	
Total Organic Carbon	mg/L	13.7	22.4	1997-11-12	8.3	1993-10-27	26	5.15	18.9	2008-10-29	3.3	2007-04-30	6	3.8	6.6	2006-11-02	2	2016-05-03	19	
Total Dissolved Solids	mg/L	1070	1370	1999-04-28	408	2018-10-31	55	350	382	2006-05-09	303	2006-11-02	5	427	963	2012-04-24	222	2017-11-02	35	500 AO
Chemical Oxygen Demand	mg/L	38.5	123	2023-05-18	<	-	52	5	28	2008-10-29	<	-	6	15	120	2011-04-14	<	-	31	
Biochemical Oxygen Demand	mg/L	2	17	2015-11-06	<	-	22	<	28	2008-10-29	<	-	6	<	6	1995-12-19	<	-	14	
Benzene	µg/L	<	<	-	<	-	13	-	-	-	-	-	0	<	<	-	<	-	9	1 CS
Toluene	µg/L	<	1.1	1995-12-19	<	-	13	-	-	-	-	-	0	<	<	-	<	-	9	60 CS
Ethylbenzene	µg/L	<	<	-	<	-	13	-	-	-	-	-	0	<	<	-	<	-	9	140 CS
Total Xylenes	µg/L	<	<	-	<	-	13	-	-	-	-	-	0	<	<	-	<	-	9	90 CS
pH	pH units	7.51	7.93	2023-05-18	6.9	2011-11-28	53	7.98	8.38	1995-12-19	7.3	2006-11-02	5	7.675	8.48	2000-04-24	7.1	2011-11-28	34	6.5 - 8.5 OG

Notes: "-" denotes not available
"<" denotes results below method detection limit
"MW ##" denotes groundwater monitoring well (### indicates groundwater monitor ID)
shading indicates parameters exceeding guideline criteria
results reported in mg/L unless indicated otherwise
AO indicates aesthetic objective OG indicates operational guideline CS indicates chemical standard

Data Input: RF
Data Check: RG

Table 6
Surface Water Program

Tasks	Location	Analyses
i. examine water for impact (i.e. discolouration, staining) ii. measure pH, EC, temperature iii. measure ditch discharge flow upgradient and downgradient of landfill iv. sample both locations v. submit samples for analyses	SW-DU (ditch upgradient of landfill) SW-DD* (ditch downgradient of landfill) SW-DP (ditch near north property line)	Schedule 5, Column 4 (landfill standards): alkalinity, BOD, COD, chloride, nitrate, nitrite, conductivity, ammonia, pH, phenols, sulphate, TKN, total phosphorous, TSS, TDS, iron, temperature and un-ionized ammonia. temperature (field), pH (field), EC (field), turbidity (field), DO (field).

*only sampled when lotic and insufficient flow encountered at SW-DP

Table 7
2024 Shallow Groundwater Relative to Drainage Ditch

Location	Ditch Elevation [1] (m)	Groundwater Elevation (m)		Shallow Groundwater Table Relative to the Drainage Ditch (m)	
		2024-05-31	2024-11-25	2024-05-31	2024-11-25
Upgradient Station (SW-DU)	97.78				
MW-TP1		97.76	dry	-0.02	NV
MW-TP2		97.74	dry	-0.04	NV
Downgradient Station (SW-DD)	96.87				
MW-8a		97.73	97.17	+0.86	+0.30
MW-2a		96.99	97.05	+0.12	+0.18

Notes: [1] ditch elevation based on 2008 survey by AECOM
NV no value available due to dry conditions
+/- denotes groundwater elevation above (+) or below (-) ditch elevation

Data Input: AS
Data Check: RF

Table 8
2024 Surface Water Chemistry Data

Parameter	Units	Location	SW-DU	SW-DD	SW-DP	SW-DU	SW-DD	SW-DP	Provincial Water Quality Objectives (MOEE, 1994)	Table A: Assessment Criteria for Waste Disposal Sites (2010)	Table B: Alternative Review Criteria - Canadian Water Quality Guidelines (CCME, 2007)
		Sample ID	24-W001	-	-	-	-	-			
		R.L.	2024-05-31			2024-11-25					
Alkalinity as CaCO3	mg/L	5	112						(see note [2])		
Ammonia-N	mg/L	0.05	0.16								
Biochemical Oxygen Demand	mg/L	3	4								
Chemical Oxygen Demand	mg/L	5	122								
Conductivity	µmho/cm	1	233								
pH	pH units	-	6.92						6.5-8.5	6.0-9.0	
Phenols	mg/L	0.001	<						0.001	0.04	0.004
Total Phosphorus	mg/L	0.01	0.86						0.03 Interm PWQO		
Total Dissolved Solids	mg/L	1	119								
Total Suspended Solids	mg/L	3	50								
Total Kjeldahl Nitrogen-N	mg/L	0.1	2.8								
Chloride	mg/L	0.5	1.6							180	128 proposed
Nitrate-N	mg/L	0.05	<	dry conditions	dry conditions	dry conditions	dry conditions	dry conditions			2.9
Nitrite-N	mg/L	0.05	<								0.06
Sulphate	mg/L	1	<							100	
Iron	mg/L	0.005	4.34						0.3	1.000	
pH (field)	pH units	-	6.73						6.5-8.5	6.0-9.0	
Conductivity (field)	mS/cm	-	0.236								
Turbidity (field)	NTU	-	136								
ORP (field)	mV	-	110								
Temperature (field)	°C	-	15.20								
Dissolved Oxygen (field)	mg/L	-	8.30						(see note [3])		
Un-ionized Ammonia [1]	mg/L	0.01	<						0.02	0.100	

Data Input: TV
Data Check: RF

Notes:

"-" not analyzed
"R.L." denotes reporting limit
"<" result below reporting limit
"SW ##" surface water station ID
Results reported in mg/L unless indicated otherwise
[1] unionized ammonia calculated using field parameters for pH and temperature
[2] alkalinity should not be decreased by more than 25% of the natural concentration
[3] dissolved oxygen is temperature dependant and based on warm water biota criteria
Dissolved Oxygen (DO) criteria: 0°C = >7mg/L 5-10°C = >6mg/L 10-20°C = >5mg/L 20-25°C = >4mg/L

denotes concentration exceeds the 1994 PWQO (as updated in 1999)

denotes concentration exceeds Table A: Assessment Criteria for Waste Disposal Sites (Source APV and others), from the Monitoring and Reporting for Waste Dispsal Sites Groundwater and Surface Water Technical Guidance Document (2010)

denotes concentration exceeds Table B: Alternative Review Criteria (Source Canadian Water Quality Guideline), from the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Techical Guidance Document (2010)

Table 9
Statistical Summary of Historical Surface Water Chemistry (Current as of 2024)

		DD						DU						PWQOs	
Parameter	Units	Median	Max	Date of Max	Min	Date of Min	# Events	Median	Max	Date of Max	Min	Date of Min	# Events		Interim Values
Alkalinity as CaCO3	mg/L	249.5	508	2023-05-18	44	2003-04-25	32	50.5	327	2015-11-06	21	2017-11-02	46		see note [1]
Biochemical Oxygen Demand	mg/L	2	8	2016-11-30	<	1900-01-02	13	4	26	2022-05-27	<	1900-01-02	26		
Chemical Oxygen Demand	mg/L	64	125	2020-11-11	<	-	13	93	203	2020-05-28	11	2011-11-28	26		
Chloride	mg/L	35	271	2020-11-11	3	2003-04-25	32	1.9	27	2003-04-25	<	-	46		
Nitrite-N	mg/L	<	0.17	1997-11-12	<	-	14	<	0.1	2016-11-30	<	-	26		
Conductivity	uS/cm	822.5	1890	2020-11-11	124	2003-04-25	32	117.5	728	1999-04-28	60	2017-11-02	46		
Dissolved Organic Carbon	mg/L	15.85	19.9	2009-11-30	14	2009-04-21	5	24.7	38	2010-04-20	17	2009-04-21	9		
Dissolved Oxygen	mg/L	9.65	11	2010-11-26	9.0	2010-04-20	5	9.55	10	2009-04-21	<	1900-01-02	7	see note [2]	
Ammonia-N	mg/L	0.04	0.29	2020-11-11	0.01	1999-11-24	31	0.045	0.59	1998-04-01	<	-	46		
Nitrate-N	mg/L	0.46	2.29	2001-11-29	<	-	31	<	1.51	2003-04-25	<	-	46		
pH	mg/L	7.91	8.54	2002-04-17	7	2003-04-25	29	6.95	7.96	1999-04-28	6	2011-11-28	44	6.5 - 8.5	
Phenols	mg/L	<	0.023	2009-04-21	<	-	30	<	0.032	2009-04-21	<	-	45	0.001	
Sulphate	mg/L	54.5	226	1999-11-24	8.00	1999-04-28	32	5	101	2001-11-29	1.00	2007-04-30	46		
Total Kjeldahl Nitrogen-N	mg/L	1.20	9.7	2014-11-07	0.50	2015-11-06	13	2.1	4.20	2020-05-28	1.30	2017-11-02	26		
Total Phosphorus	mg/L	0.185	1.02	2020-11-11	0.05	2015-11-06	12	0.39	2.53	2020-05-28	0.14	2019-06-05	25		0.030
Iron	mg/L	1.07	17	2020-11-11	0.01	2023-05-18	31	2.28	46	2005-11-02	<	-	46	0.300	

		DP						PWQOs	
Parameter	Units	Median	Max	Date of Max	Min	Date of Min	# Events		Interim Values
Alkalinity as CaCO3	mg/L	157	271	2022-11-24	93	2011-04-14	11		see note [1]
Biochemical Oxygen Demand	mg/L	<	11	2019-06-05	<	-	11		
Chemical Oxygen Demand	mg/L	48	96	2017-06-07	19	2022-11-24	11		
Chloride	mg/L	26	211	2013-11-12	8.10	2017-06-07	11		
Nitrite-N	mg/L	<	<	-	<	-	11		
Conductivity	uS/cm	506	1140	2013-11-12	253	2011-04-14	11		
Dissolved Organic Carbon	mg/L	13.75	22.80	2012-04-24	6.30	2013-11-12	4		
Dissolved Oxygen	mg/L	10	11	2010-11-26	9	2013-11-12	3	see note [2]	
Ammonia-N	mg/L	0.04	0.200	2013-11-12	0.010	2022-11-24	11		
Nitrate-N	mg/L	0.1	0.6	2014-05-08	<	-	11		
pH	mg/L	8.01	8.60	2014-05-08	7.60	2013-11-12	11	6.5 - 8.5	
Phenols	mg/L	<	0.022	2017-06-07	<	-	11	0.001	
Sulphate	mg/L	23	61	2014-05-08	10	2011-04-14	11		
Total Kjeldahl Nitrogen-N	mg/L	1	1.8	2012-04-24	0.8	2022-11-24	11		
Total Phosphorus	mg/L	0.12	0.26	2022-11-24	0.060	2014-05-08	11		0.030
Iron	mg/L	0.37	1.54	2017-06-07	0.091	2022-11-24	11	0.300	

Notes: "-" denotes not available
"<" denotes results below method detection limit
results reported in mg/L unless indicated otherwise

[1] alkalinity should not be decreased by more than 25% of the natural concentration

[2] dissolved oxygen is temperature dependant and based on warm water biota criteria
DO criteria: 0°C = 7mg/L 5°C = 6mg/L 10-15°C = 5mg/L 20-25°C = 4mg/L

Data Input : RF
Data Check: RG

Appendix E
List of Materials Accepted for Recycling

Garbage and Recycling

New - Garbage and Recycling App

recycle coach Stay up to date on collection days and have all your garbage and recycling questions answered!

Waste & Recycling Information Report a Problem

My Schedule What Goes Where Discovery Zone

To get waste and recycling information for where you live, select your municipality

Choose your area

Material List User Agreement Privacy Policy

To the curb by 7 a.m - maximum 40lbs/18kg a bag or can

- All your waste and recycling items **must be placed at the curbside by 7 a.m. on the morning of your collection day** to make sure everything is picked up. If you are late - collection crews are not able to return.
- Maximum weight of garbage that can be placed at the curb is **18kgs/40lbs**.

- All garbage bags placed at the curb must have a properly affixed bag tag on the **bag.**

Bag Tags

Brush/Yard Waste

Composting

FLIDO

Garbage

Giveaway Day

Landfills

Recycling

How Often and When?

- Mainland curbside pickup of garbage and recycling happens three days a week.
    - Amherst Island residents can take their garbage and recycling directly to the landfill.
- Brush and yard waste are collected separately in the spring and fall every year.
- Household hazardous waste should be taken to the Kingston Area Recycling Centre (KARC).

2024 Municipal Calendar

Download an electronic version of the 2024 Loyalist Township Municipal Calendar (pdf: 8 MB).

It provides information on garbage and recycling schedules, recycling sorting, landfills, giveaway days, local events and more!

Box 70, 263 Main Street
Odessa, Ontario K0H 2H0
Tel: 613-386-7351
info@loyalist.ca

Office Hours

Mon - Fri 8:30 a.m. to 4:30 p.m.

After-Hours Emergencies
Involving Roads, Water/Sewer Service, or a Township Facility
Call 613-507-3069

By GHD Digital (https://ghddigitalpss.com/)

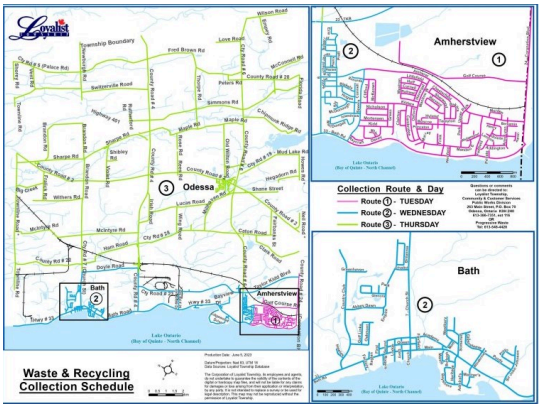
Garbage

New! Stay up to date on collection days. Download the recycle coach app at the links below.

Download on the App Store GET IT ON Google Play

Pickup schedules

If you live in mainland Loyalist Township, your garbage is picked up on the same day each week, depending on your area. This map shows the collection areas (select map for larger version).



Map legend: Pink – Area 1 – Tuesday Blue – Area 2 – Wednesday Green – Area 3 – Thursday

Garbage is picked up every week. Pickup is done by Waste Connections, the Township's contractor. We also publish the collection schedule in the municipal calendar.

What if a schedule changes?

Your pickup day may change if a holiday overlaps with a regular collection day. Sometimes your pickup will be earlier than you're used to. We print regular schedules and changes in our calendar, and changes are listed on our website. Sign

up to receive notifications when there are schedule disruptions by downloading the recycle coach app.

My garbage wasn't collected

Review the garbage pickup rules below. If you're not sure why your garbage was missed, call our office at 613-386-7351, ext. 116.

Garbage pickup rules

- Garbage must be at the curb by 7 a.m. and is usually picked up by 5 p.m.
- You can put it out at 6:30 p.m. or later the night before.

Garbage Bags

- Every bag needs a bag tag.
- Each bag must weigh no more than 18 Kg (40 lbs).
- The largest bag size is 75 cm x 95 cm (30” x 38”).

Garbage Cans

- Multiple kitchen/grocery bags can be placed in a container, to a maximum of 18 Kg (40 lbs).
- Fasten bag tag to the top bag in container.
- The largest container size is 77 litres (17 gallons).

Amherst Island residents

If you live on Amherst Island, please take your garbage and recycling to the Amherst Island landfill. Garbage must be tagged or tipping fees will apply.

Bag tags

We have a “pay as you throw” system for garbage, meaning that you need to purchase garbage bag tags. Every bag of garbage needs a bag tag when it's put out at the curb.

Visit our bag tag page to find further details regarding bag tags in Loyalist Township, or to purchase bag tags.

Purchase Bag Tags Online

Source separated organics survey

In the fall of 2020, Loyalist Township released a survey to engage with residents on current waste practices and to collect feedback on potential source separated organic waste programs. The survey closed on December 23, 2020. Results and data were analyzed and recommendations to Council followed based on the input collected. Visit our Climate Action Page to learn more about the Township's ResiLienT Climate Action Plan.

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By GHD Digital (https://ghddigitalpss.com/)

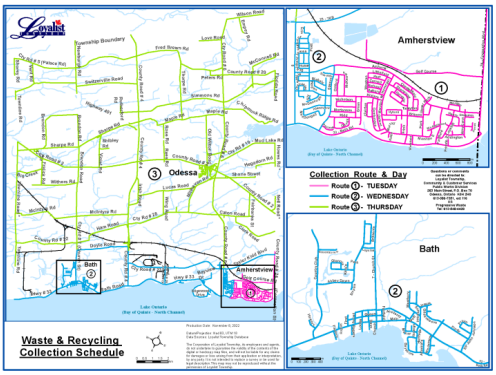
Recycling

New! Stay up to date on collection days. Download the recycle coach app at the links below.

Download on the App Store GET IT ON Google Play

Pickup schedules

If you live in mainland Loyalist Township, your recycling is picked up on the same day each week, depending on your area. This map shows the collection areas (select map for larger image).



Map Legend: Pink – Area 1 – Tuesday Blue – Area 2 – Wednesday Green – Area 3 – Thursday

Recycling pickup rotates between grey box one week and blue box the next week. Pickup is done by Waste Connections, the Township's contractor. We publish the collection schedule in the Township's municipal calendar.

Changes to schedules

Your pickup day may change If a holiday overlaps with a regular collection day. Sometimes your pickup will be earlier than you're used to. We print regular schedules and changes in our calendar, and changes are listed on our website. Sign up to receive notifications when there are schedule disruptions by downloading the recycle coach app.

My recycling wasn't collected

1. Review the recycling pickup rules below.
2. Ensure you had the right items out for the correct week.
3. Review how to properly prepare your recyclables.
4. If you aren't sure why your recycling was missed, call our office at 613-386-7351, ext. 116.

Recycling pickup rules

1. Recycling must be at the curb by 7 a.m. and is usually picked up by 5 p.m.
2. You can put it out at 6:30 p.m. or later the night before.
3. Pickup schedules alternate between blue box items one week and grey box items the next.

You can also take recyclables to the Kingston Area Recycling Corporation (KARC), 196 Lappan's Lane, Kingston. It is open year-round, Monday to Friday from 8 a.m. to 5 p.m., and Saturday from 8 a.m. to 4 p.m. This is free for Township residents.

Recycling bins

- New residents will receive one free grey and blue box per household.
- You can pick up recycling bins at the Odessa municipal office.
- Extra bins are $8 each.
- If your box is damaged, bring it back to the Odessa office and it will be replaced at no charge.

Recycling process

- Recycling materials collected in Loyalist Township are processed for recycling at the Kingston Area Recycling Centre. This video shows you what

happens to your recycled waste after it is collected at the curb and sorted at the Kingston Area Recycling Centre.

Amherst Island Residents

If you live on Amherst Island, please take your recyclables to the Amherst Island landfill.

What goes in your blue and grey bins?

When you prepare your recyclables properly, you help make sure our drivers can complete their routes efficiently. We have created a handy printable guide you can post in your home to help you sort your recyclables. Download the recycle coach app and use the *What Goes Where Tool* to search more than 15,000 items!

Blue bin

Plastic

YES: Plastic bottles, jars, tubs and lids, cartons, trays, clamshell, and other rigid plastic packaging. All plastic types with a recycling symbol on them are recyclable, regardless of the number in the symbol.

NO: Plastic pails over 10 litres, toys, laundry baskets, storage totes, or large plastics that are not a food, beverage, or household container or rigid package.

Styrofoam

YES: White rigid Styrofoam pieces, no longer than 90cm x 60cm x 20 cm (35" x 23.5" x 7.75").

NO: Coloured or dyed Styrofoam of any size, popcorn Styrofoam, or flexible Styrofoam.

Glass

YES: clear and coloured glass bottles and jars. Return beer and alcohol bottles to The Beer Store or LCBO for a refund.

NO: broken glass, window panes, mirrors, light bulbs, ceramics, drinking glasses.

Aluminum and steel

YES: metal food and beverage cans. Metal lids can be placed inside a can and pinched shut. Labels do not need to be removed. Paper cans with metal ends (i.e., coffee cans, chip cans, nut cans, frozen juice cans, etc.)

NO: Aerosol or paint cans, cooking pots or pans, foil wrap, paper-backed foil (such as takeout container lids), or foil laminates (potato chip bags)

Grey bin

Paper products

YES: newspaper, white paper, coloured paper, colour flyers, catalogues, telephone books, soft cover books, magazines, envelopes, and hard cover books with the cover removed. Place in a clean, untied grocery or paper bag or tie in bundles. This stops the paper from blowing away.

NO: gift wrap.

Plastic bags

YES: grocery bags, milk bags/pouches, frozen vegetable bags, and newspaper sleeves. Place all clean bags into an empty bag and tie shut.

NO: cereal/cracker box liners, plastic food wrap, zipper-type storage bags, diapers, meat/bacon packaging, "crinkly" outer packaging (such as pasta bags), pet food bags, or bubble wrap.

Boxboard and polycoat

YES: cereal boxes, cracker boxes, frozen food boxes, egg cartons, paper towel tubes, drink trays, greeting cards.

Polycoat: Rinse and flatten milk cartons, juice cartons, and Tetra Pak juice boxes. Place together with boxboard.

Boxboard: flatten and bundle or place inside another box.

Corrugated cardboard

Remove staples and tape. Flatten and bundle no bigger than 0.9m x 0.6m x 0.08m (36" x 24" x 8"). Tie bundles with string. There is limit of six bundles per collection. Place bundles beside your Grey Box.

NO: wax-coated boxes or soiled pizza boxes.

Hazardous Waste

NO HAZARDOUS WASTE. Household hazardous waste (HHW) includes products like used motor oil and empty motor oil containers, leftover paint, and chemicals that can't go into the garbage or recycling bin. Our HHW program is managed through the City of Kingston and is free for Loyalist Township residents.

Kingston's **HHW depot** is at 196 Lappan's Lane. It's open Thursdays and Saturdays from April through November. Check to see what they accept before you go.

Battery Recycling

Loyalist Township has a battery recycling program to help residents safely recycle batteries. Recycling your batteries helps protect your community from materials that may harm the environment if they end up in landfills.

Visit our battery recycling page to find additional information on the Township's battery recycling program.

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After-Hours Emergencies
Involving Roads, Water/Sewer Service, or a Township Facility
Call 613-507-3069

By GHD Digital (https://ghddigitalpss.com/)

Brush and yard waste

Loyalist Township provides separate collections for brush and yard waste in spring and fall. Crews will pass through an area only once for each collection. They will not return for late items.

Brush pickup

Collections are twice a year and usually in April and October. Please refer to the municipal calendar or website calendar for this year's dates.

- Brush must be at the curb no later than 7:00 a.m. on the first day of the program
- Branches no larger than 4 inches in diameter
- Please stack brush with cut ends facing out (towards road)
- Households are limited to 1.78m3 (64 cu ft) or one half-ton pickup truck load
- Yard waste is not included

Yard waste pickup

Collections are twice a year and usually in May and November. Please refer to the municipal calendar or website calendar for this year's dates.

- Yard waste must be at the curb no later than 7:00 a.m. on the first day of the program
- paper bags only (Kraft)
- brush is not included
- no plastic bags of any type*
- defined as anything that is, or once was, growing in your yard, for example, grass clippings, leaves, flowers, hedge trimmings.

- excludes food waste, pet faeces, soil, rocks, or any non-organic debris you may rake up from your lawn.

*****It is important that yard waste is not put in plastic bags of any type, even those marked as biodegradable or as suitable for municipal yard waste. They are not acceptable for Loyalist's program. Yard waste placed in plastic bags of any kind will be left at the curb.

Kingston Area Recycling Centre

Both brush and yard waste can be dropped off at Kingston Area Recycling Centre, 196 Lappan's Lane, Kingston. This is free of charge to Loyalist residents and it is open year round.

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Call 613-507-3069

Composting

Wish you could keep your kitchen scraps, eggshells, and coffee grounds out of your garbage bin?

Consider backyard composting! Composting is an ideal way to cut down on your green waste while generating a free, rich fertilizer for your vegetable and flower gardens.

Loyalist Township sells backyard compost bins at the Odessa Municipal Office for $37+HST.

Learn more about effective backyard composting, and what should and should not go in your composter!

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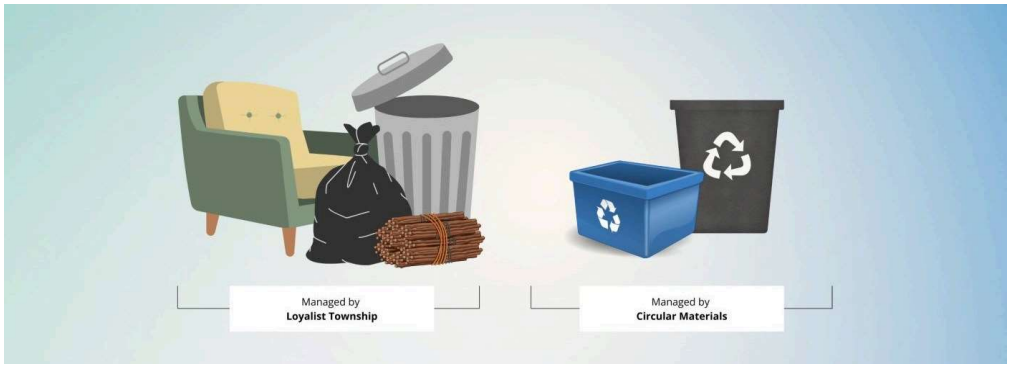
Call 613-507-3069

Recycling Transition

Changes coming to recycling collection

Under the Blue Box Regulations, Ontario is changing the responsibility for recycling to producers rather than municipalities. Residential recycling programs in Ontario are moving to a new collection system that is fully funded and operated by producers of recycling materials. This shift to a framework called **extended producer responsibility** becomes effective in Loyalist Township on **July 1, 2025.** The new collection system will make recycling easier by standardizing what can be recycled across Ontario.



What does this mean for Loyalist residents?

Your residential curbside recycling will still be collected and removed. All materials previously collected will continue to be collected. It is possible more material types may be included in future by Circular Materials.

Waste Connections will continue to handle the garbage collection. Emterra Group has been contracted by Circular Materials to handle the recycling from July 1, 2025.

Timeline

- **January 1 to June 30, 2025**
    - Loyalist continues to manage all garbage and recycling.

- **July 1 to December 31, 2025**
    - **Business Owners** will need to set up their own collection agreements directly with contractors.
    - **Mainland curbside blue box** recycling collection services will remain unchanged.
    - **Amherst Island** residents should continue to drop off recycling at the Amherst Island waste management site where signage will be updated.
- **January 1, 2026 onwards**
    - Circular Materials will take full responsibility for recycling collection and management and may introduce some changes to the program.

How will this affect me?

Residents that receive curbside blue box collection

July 1, 2025 – December 31, 2025

Your curbside blue box recycling services will remain unchanged. Collection dates and acceptable materials will stay the same, but separate contractors will handle garbage and recycling collection starting July 1, 2025. Circular Materials has awarded the contract for Loyalist Township collection to Emterra Group.

- Emterra will provide curbside collection for recycling
- Emterra will handle new and replacement recycling receptacles at a location in Napanee
- Emterra will handle customer inquiries about missed recycling collection
- Waste Connections will continue to provide curbside collection for garbage.

January 1, 2026 – July 1, 2026

Curbside collection of Garbage and Recycling will continue to be provided by Waste Connections. Information on the Blue Box transition will be provided though municipally managed social media sites, our Loyalist Township garbage and recycling webpage, the Recycle Coach app, Engage Loyalist, and on an information pamphlet included with the Q1 Tax notice.

Starting January 1, 2026

Circular Materials will take full responsibility for recycling collection and management and may introduce some changes to the program.

After January 1, 2026

You will still have access to the app, Recycle Coach, where you will find information on scheduled collection days, service disruptions and acceptable recycling materials including any updates on acceptable recycling materials provided by Circular Materials. We will continue to manage all other notifications on the Recycle Coach app.

Industrial, Commercial, or Institutional (ICI) Business Owners

As of **July 1, 2025**, ICI businesses will no longer qualify for blue box recycling services provided by Circular Materials or Loyalist Township as per O. Reg. 391/21: BLUE BOX and Council Resolution 2024-127, "Blue Box Transition - Non-Eligible Sources,".

Letters have been sent to affected businesses with further details. If you believe you received this letter in error or have not received a letter, please contact Loyalist Township for clarification.

ICI businesses will continue to have access to recycling options, although they will be required to set up collection agreements with private contractors. Below is a list including some of the contracts offering collection services for ICI businesses:

- Waste Connections of Canada – Kingston
- Environmental 360 Solutions
- Emterra Group
- Waste Management

The collection and management of recycling for municipally owned and operated facilities will continue under a separate private contract.

A limited number of ICI businesses that received collection service prior to 2025, will continue to have garbage collection provided by Loyalist Township. We would like to remind qualifying ICI businesses that it is important to divert recycling materials from landfills. Co-mingled garbage and recycling will be refused at pickup. Repeat offenders may be asked to coordinate separate garbage collection contracts.

Amherst Island residents using the waste/recycling depot

January 1, 2025 – July 1, 2025

Updated signage and a more comprehensive list of acceptable materials will be developed and installed. The focus will be on enhancing your experience and providing a functional site layout that works for you. We also plan to roll out a site plan to help you become more familiar with how your waste is being sorted. You'll have access to this from July 1, 2025.

July 1, 2025 – December 31, 2025

You may continue to drop off your recycling materials at the Amherst Island waste management facility. The list of accepted materials and the number of streams will remain the same. Updated signage and onsite guidance will be available. The Emterra Circular Materials contractor will manage different bins on-site effective July 1, 2025.

Starting January 1, 2026

Circular Materials will assume responsibility for the collection of bins onsite and the management of recycling materials offsite. Our staff will continue to manage operations onsite, including both garbage and recycling. Changes to the acceptable number and types of recycling material may be adopted by the program.

After January 1, 2026

You'll still have access to Recycle Coach where you'll find hours of operation, service disruptions, and acceptable recycling materials, including any updates on acceptable recycling materials provided by Circular Materials. We will continue to manage all other notifications on Recycle Coach.

FAQs

What will stay the same?

- Your collection schedule won't change. Garbage and recycling will continue to be collected by your Zone. (Amherst Island residents should continue to drop off garbage and recycling at the Amherst Island waste management site, 145 Dump Road)
- Please continue to sort recycling materials for the appropriate collection day. Check Recycle Coach or the 2025 Township calendar for what goes where and when.

- Acceptable Blue Box Materials remain the same. You can check acceptable materials on Page 14 of the 2025 Township calendar or at our recycling webpage.
- If garbage collection was offered to you in 2024, it will remain the same.
- For new developments, the Township will provide garbage collection for residential developments only.

What will change?

- Blue box issues or concerns should be directed to Emterra.
- Starting July 1, 2025, (ICI)Industrial, Commercial or Institutional property owners, will be required to partner with their own collection contractor. Violet Landfill will not accept recycling contained in the garbage.
- Obtaining new blue boxes or exchanging broken blue boxes will be handled by Emterra.

When will the recycling transition happen?

July 1, 2025

Why is the recycling program changing?

Historically, Ontario's blue box programs were operated by municipalities who were responsible for paying about half of the costs of the program, with producers responsible for the other half. Now, under the current version of the Blue Box Regulations, Ontario is transitioning to a new model where **producers** – the organizations that produce the products and packaging – **are 100% responsible** for operating and funding the program.

Do I have to replace the recycling bins I already have?

- During the transition period, Emterra will keep providing the same recycling services, including picking up the recycling bins that we previously provided to you. Other bins that are still okay to use are those brought into the Township from other areas, but cart-style bins won't be accepted.

- After January 1, 2026, Emterra may choose to change the types of bins they collect. This will depend on the size and method they think works best. New or updated bins could include containers, carts, bags, or other types of bins for recycling. During the transition, you can continue to use the bins that you already have. Also, unless there's an agreement with a producer or organization, the person who gets a recycling bin (like a resident) doesn't actually own the blue box bins given under this rule.
- Circular Materials will share any updates about recycling changes to bins and programs using different methods, including **Recycle Coach**, which is an app that we currently offer for free to help keep you informed. (If you haven't downloaded it yet, please take advantage of the convenience it gives you. You can download from the various APP stores or via the links on our Recycling page)

Where do I get new or replacement recycling bins?

- Emterra has told us that the facility for new or replacement blue boxes will be in Napanee, but we don't know where as yet.
- We haven't been given any details yet of Emterra's requirements for new or replacement bins, but we will let you know once we do.
- It has been confirmed that there will be no cost for new or replacement blue box bins.

What about the Recycle Coach app?

Circular Materials and Loyalist Township will be using the same app platform, Recycle Coach, to provide updates and information on collection times, dates, materials, and any delays. We have an information-sharing agreement in place, so we will be able to provide seamless updates to you through an app that is already familiar and in use by many of you. (If you haven't downloaded it yet, please take advantage of the convenience it gives you. You can download from the various APP stores or via the links on our Recycling page)

What advantages does the new system have?

Extended Producer Responsibility, or EPR, is recognized as one of the most effective mechanisms to improve recycling rates. It helps advance a circular economy where materials are collected, recycled, and returned to producers for use as recycled content in new products and packaging.

What is a circular economy?

Ontario is moving from a linear economy to a circular economy. In a linear economy, natural resources are extracted, manufactured into products, consumed and then thrown away. In a circular economy, products and packaging are designed to minimize waste and then be recovered, reused, recycled and reintegrated back into production. Some great articles about this approach can be found on the RPRA website.

How will the Township ensure recycling isn't mixed with garbage?

Regular Inspection and Audits will help us determine the composition of garbage and help us make more informed discussions.

Education Campaigns will help us keep you informed about options for diversion and recycling as they become available. Education will also reinforce the importance of proper waste management techniques.

Penalties for Non-Compliance may be included in a review of our current waste by-law for those who regularly fail to separate their recycling from waste.

Does this mean our taxes won't include recycling costs in future?

Not exactly. While it may seem like the cost of recycling is being transferred to producers and removed from the consumer, there is still a cost to the Township.

Municipalities themselves are producers of recyclable materials and must pay fees to have these materials collected and managed under the Blue Box Regulation.

Examples of materials we produce include:

- Municipal Calendars
- Guides
- Construction and Utility notices
- Tax bills
- Recreation brochures and guides
- Other informative material that we provide to residents throughout the year

We pay fees to the RPRA for reporting this material and Fees to a Producer Responsibility Organization (PRO) for the collection and management of these materials.

Additionally, we are still responsible for managing a separate contract for the collection of our recycling material at Township owned and operated facilities as we fall under the (ICI) Industrial, Commercial or Institutional property owners Non-eligible sources for recycling collection. Without subsidization from Stewardship fees, we rely on tax revenue to pay for these costs.

How is the Township reducing fees associated with the recycling it produces?

While the Township is required to pay fees for the materials we produce and provide to our community, there is always room for improvement and even some cost savings along the way.

By moving more of our communications to a digital platform and offering more resources online, Loyalist can shift from a paper-based model to a more efficient digital platform, providing quick and easy access to information such as calendars, guides, notices, and tax statements.

That said, we won't do away with paper entirely. In accordance with the *Accessibility for Ontarians with Disabilities Act*, we will continue to provide copies of many Township documents in paper format to ensure everyone has equal access to information.

What is a circular economy?

Ontario is moving from a linear economy to a circular economy. In a linear economy, natural resources are extracted, manufactured into products, consumed and then thrown away. In a circular economy, products and packaging are designed to minimize waste and then be recovered, reused, recycled and reintegrated back into production. Some great articles about this approach can be found on the RPRA website.

What is the EPR model?

The **Extended Producer Responsibility, or EPR,** model shifts responsibility for the collection, processing, and recycling of blue box materials to the producers – the companies that supply these materials to you.

This change is part of Ontario's new Blue Box Regulation, passed in 2021, which takes effect over a transition period between 2023 and 2026.

Loyalist Township has been directed to adopt this model by **July 1, 2025**.

What is a PRO?

A **Producer Responsibility Organization, or PRO,** is a business established to contract with producers to help them meet their regulatory obligations under the Blue Box Regulation.

What is the RPRA?

The RPRA, or Resource Productivity and Recovery Authority, is the regulator mandated by the Government of Ontario to enforce the province's circular economy laws.

If you have other questions you can Engage Loyalist on the Recycling Transition - Circular Materials Ontario topic or email the Public Works Technical Supervisor

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Box 70, 263 Main Street
Odessa, Ontario K0H 2H0
Tel: 613-386-7351
info@loyalist.ca

Office Hours

Mon - Fri 8:30 a.m. to 4:30 p.m.

After-Hours Emergencies

Involving Roads, Water/Sewer Service, or a Township Facility
Call 613-507-3069

By GHD Digital (https://ghddigitalpss.com/)

WASTE MANAGEMENT SITE

AMHERST ISLAND

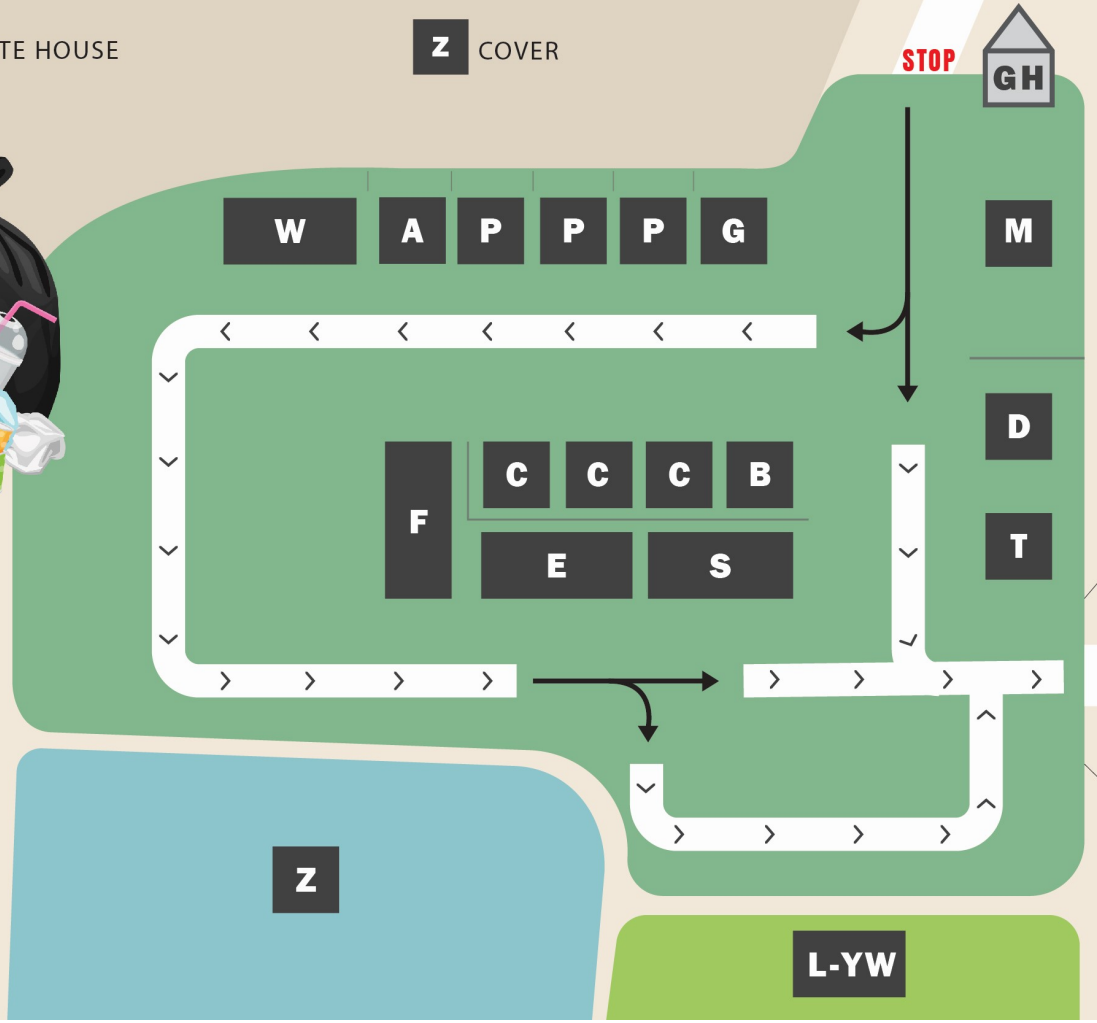
145 DUMP ROAD, STELLA

- **A** ALUMINUM & STEEL CANS
- **B** PLASTIC BAGS
- **C** CARDBOARD & PAPER PRODUCTS
- **D** FILDOS
- **E** ELECTRONIC WASTE
- **F** WHITE GOODS (FREON ITEMS)
- **G** GLASS BOTTLES & JARS
- **GH** GATE HOUSE
- **L-YW** LEAF & YARD WASTE
- **M** MATTRESSES
- **P** PLASTIC AND RIDGID WHITE STYROFOAM
- **S** SCRAP STEEL
- **T** TIRES
- **W** GENERAL WASTE
- **Z** COVER

HOURS OF OPERATION

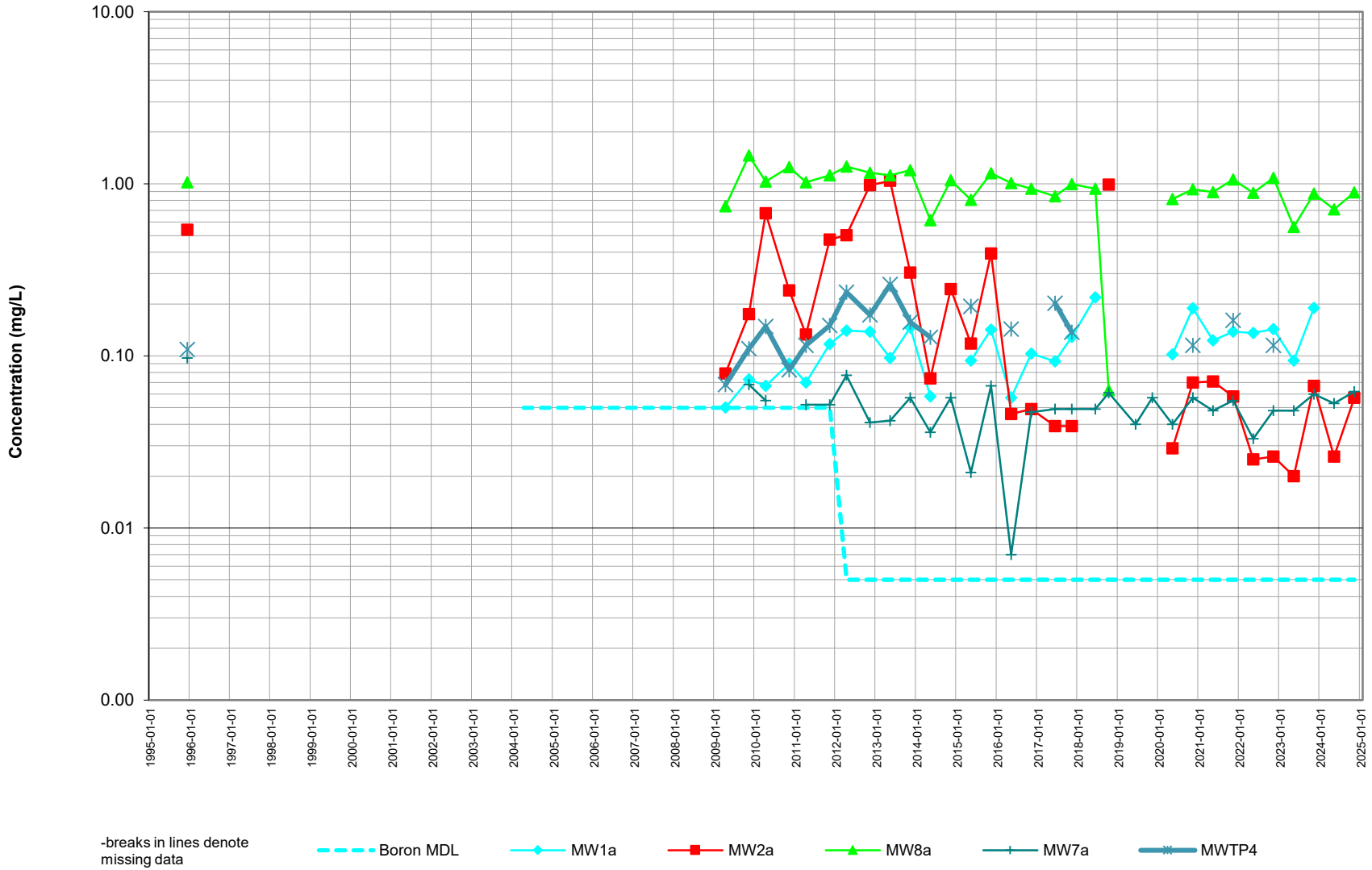
MONDAY | CLOSED
TUESDAY | CLOSED
WEDNESDAY | 11:00 A.M. TO 2:00 P.M.
THURSDAY | CLOSED
FRIDAY | CLOSED
SATURDAY | 10:00 A.M. TO 12:00 P.M.
SUNDAY | 2:00 P.M. TO 4:00 P.M.

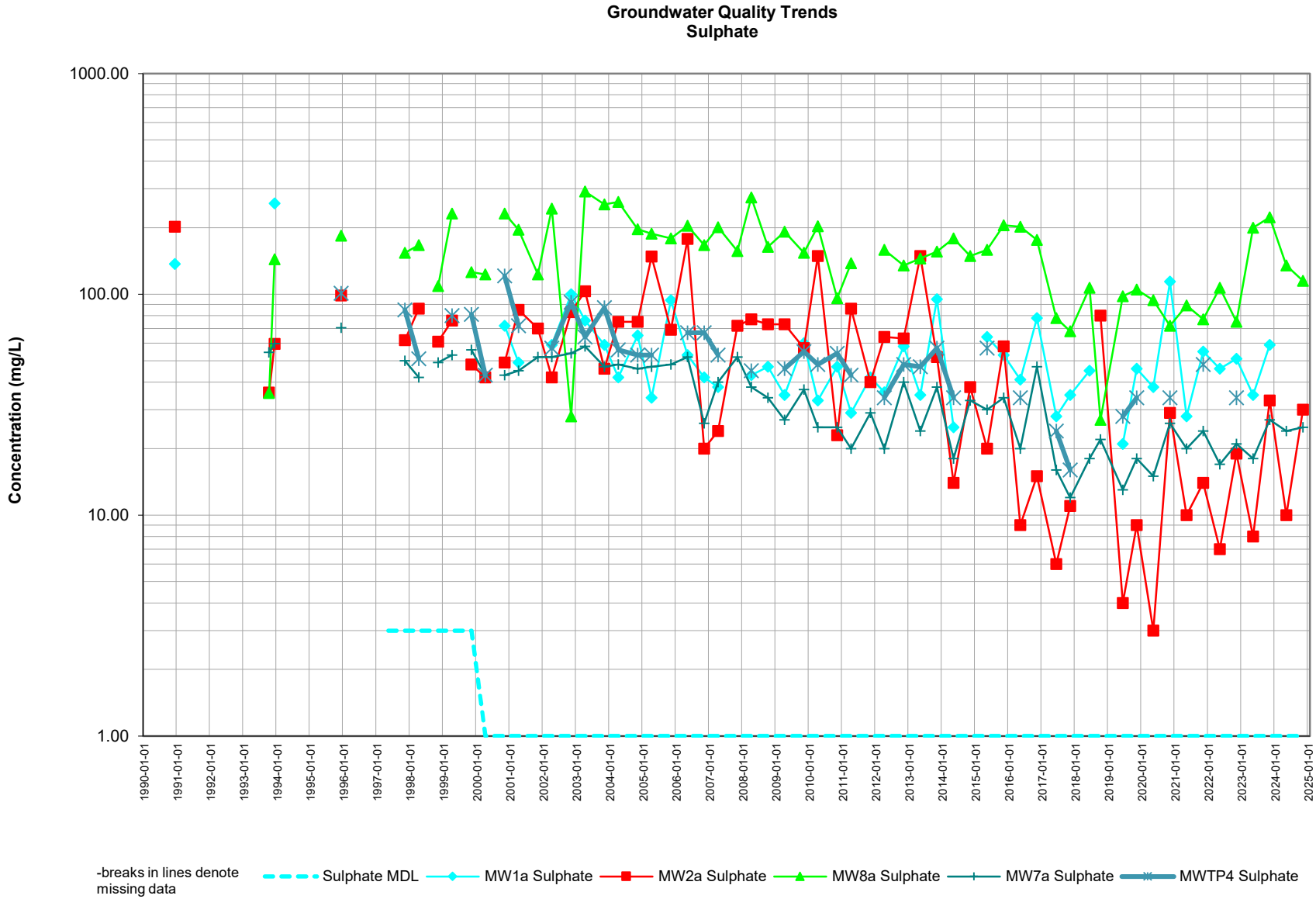
PUBLIC ACCESS AREA



Appendix F
Trend Graphs

Groundwater Quality Trends
Boron




Groundwater Quality Trends
Sulphate
Concentration (mg/L)
1000.00
100.00
10.00
1.00
1990-01-01
1991-01-01
1992-01-01
1993-01-01
1994-01-01
1995-01-01
1996-01-01
1997-01-01
1998-01-01
1999-01-01
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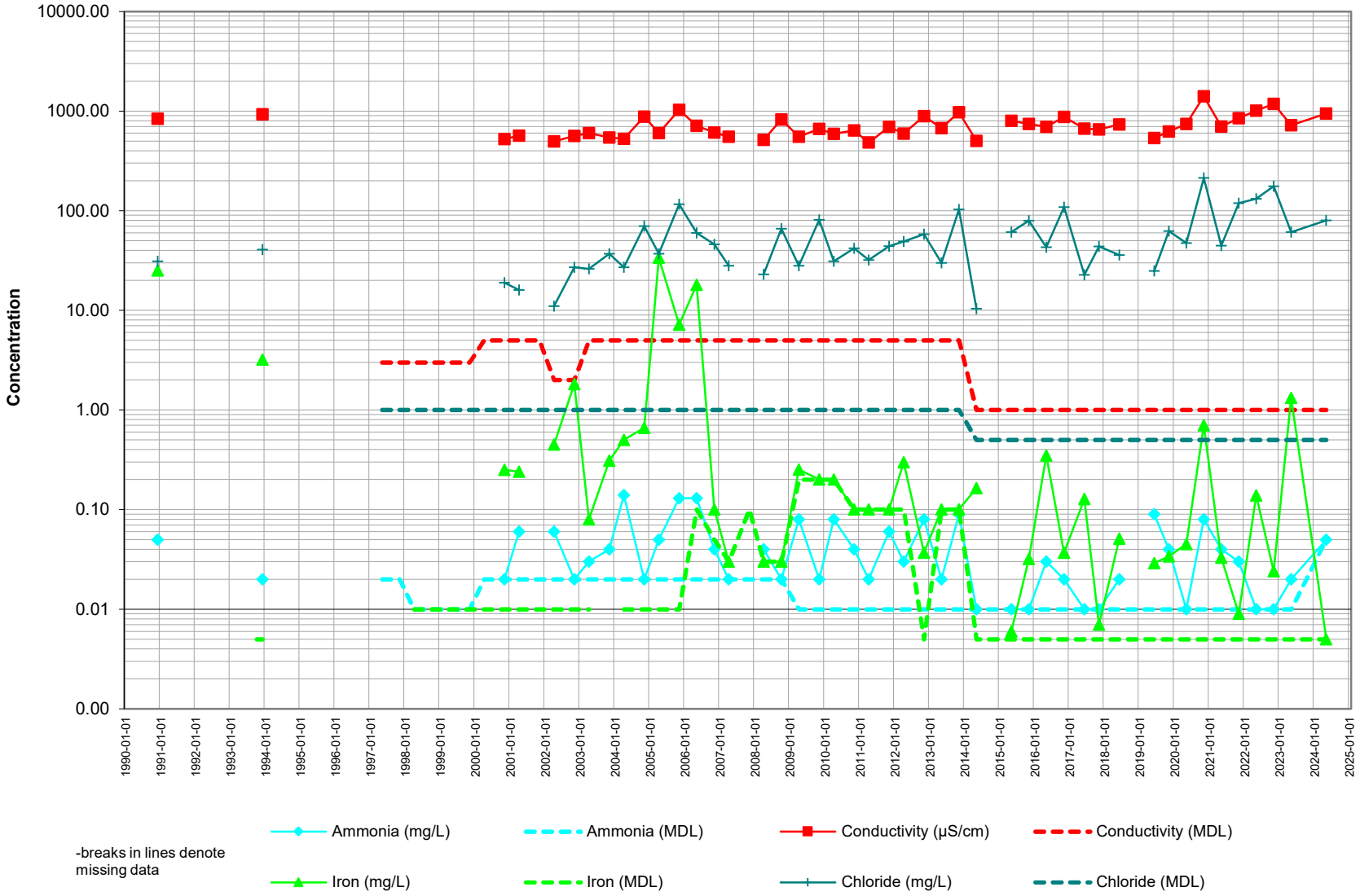
2019-01-01
2020-01-01
2021-01-01
2022-01-01
2023-01-01
2024-01-01
2025-01-01
-breaks in lines denote missing data
Sulphate MDL
MW1a Sulphate
MW2a Sulphate
MW8a Sulphate
MW7a Sulphate
MWTP4 Sulphate

Groundwater Quality Trends
Monitor MW-1a



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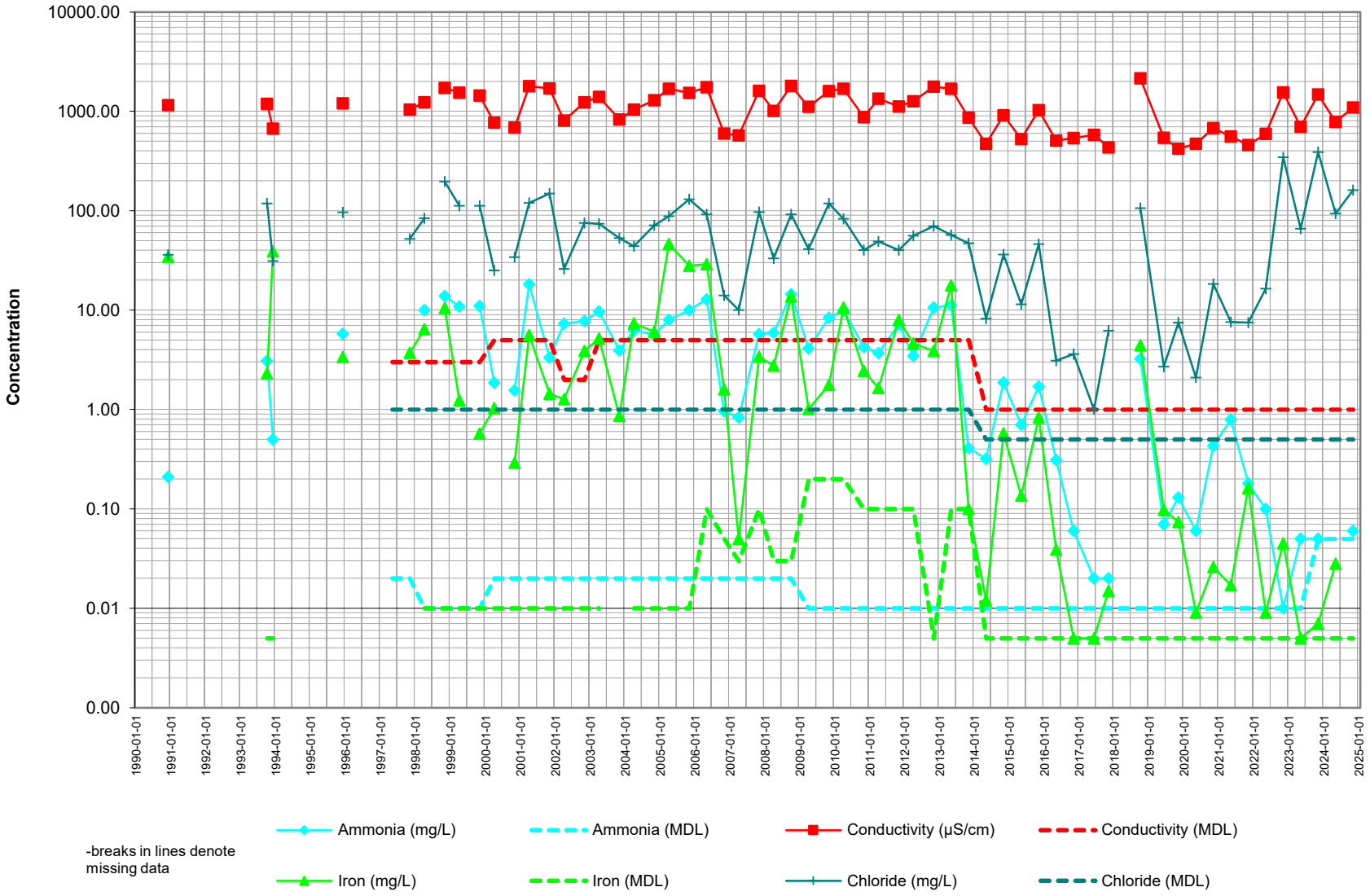
Groundwater Quality Trends
Monitor MW-2a



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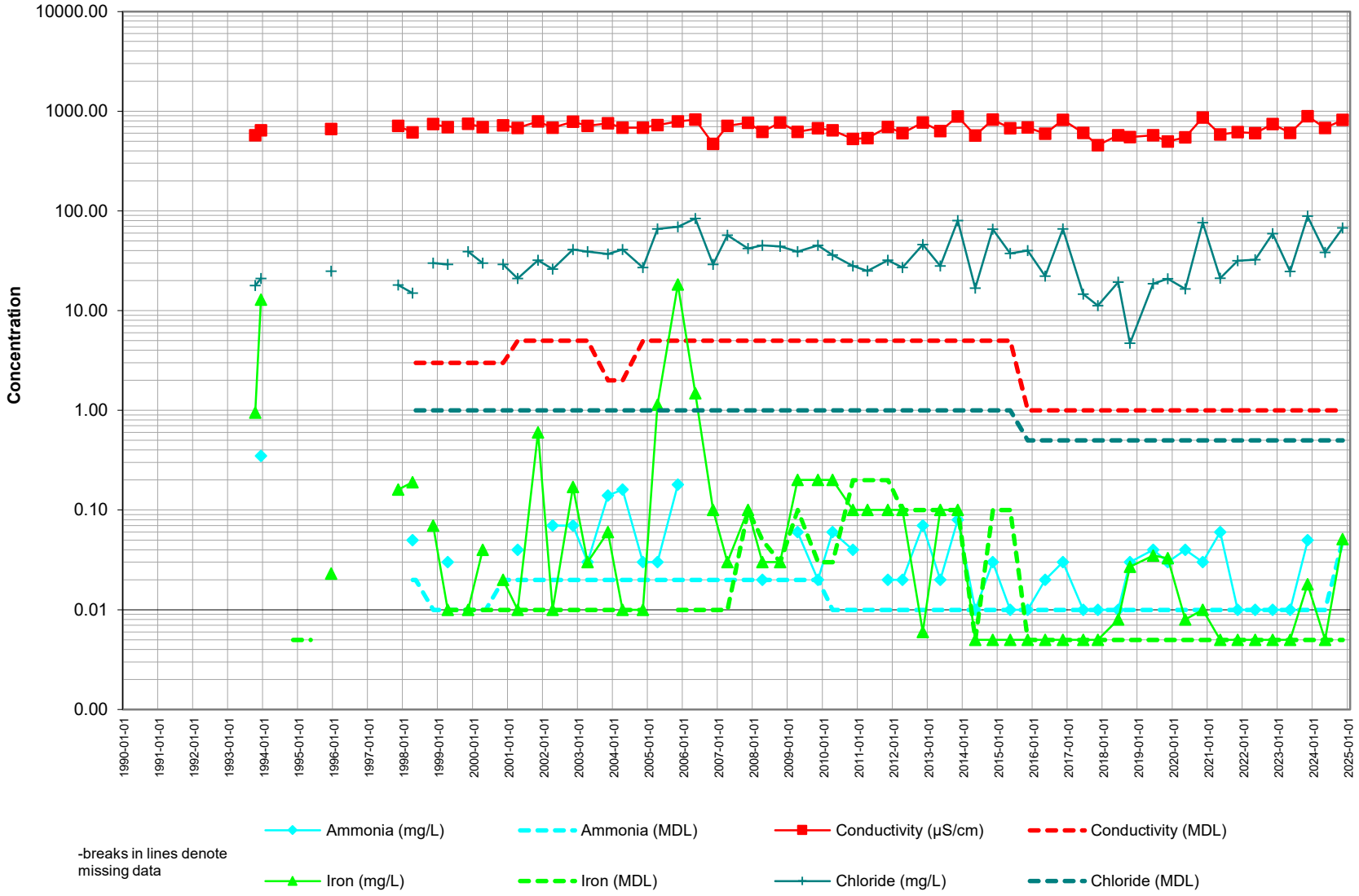
Groundwater Quality Trends
Monitor MW-7a



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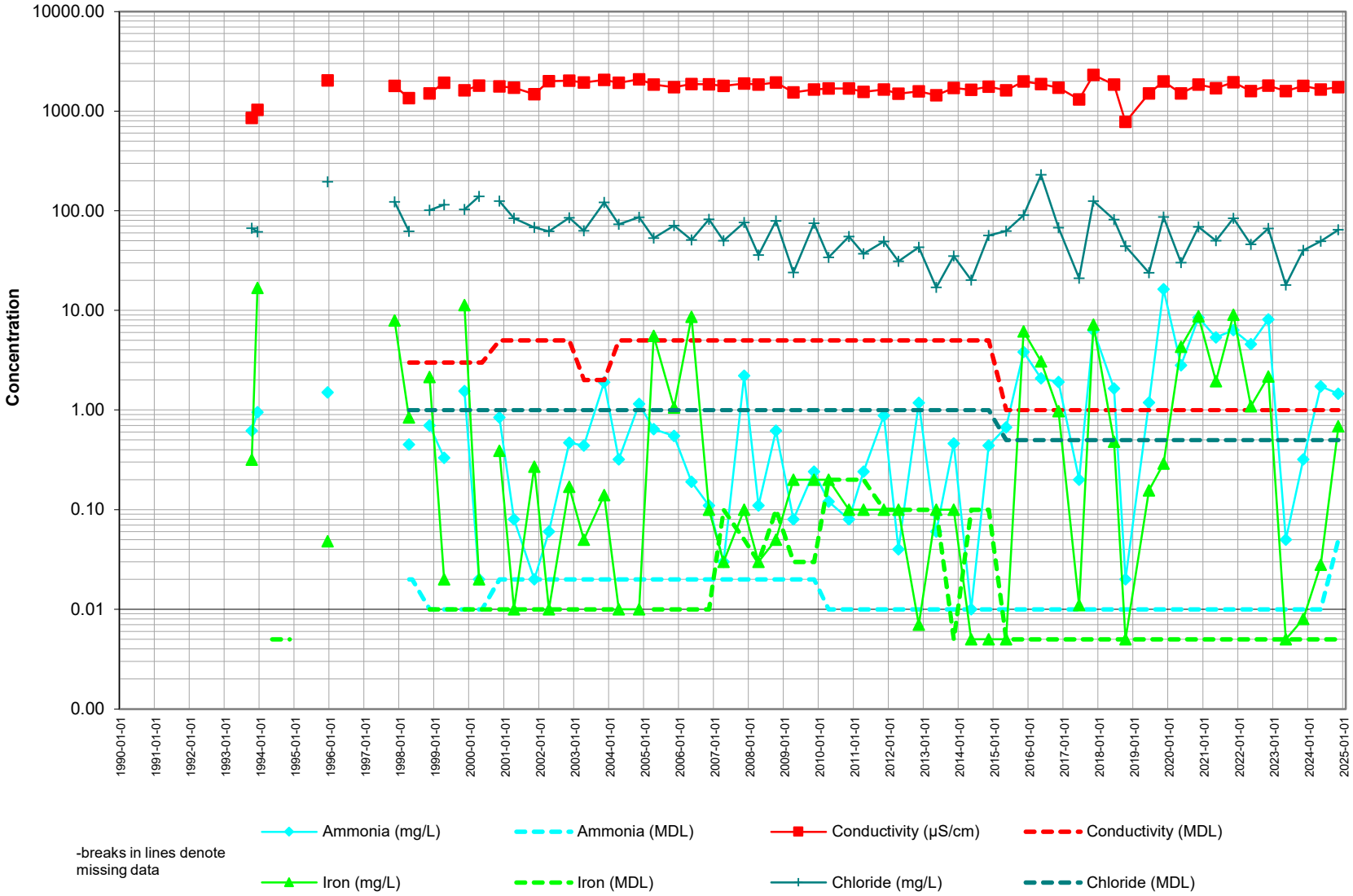
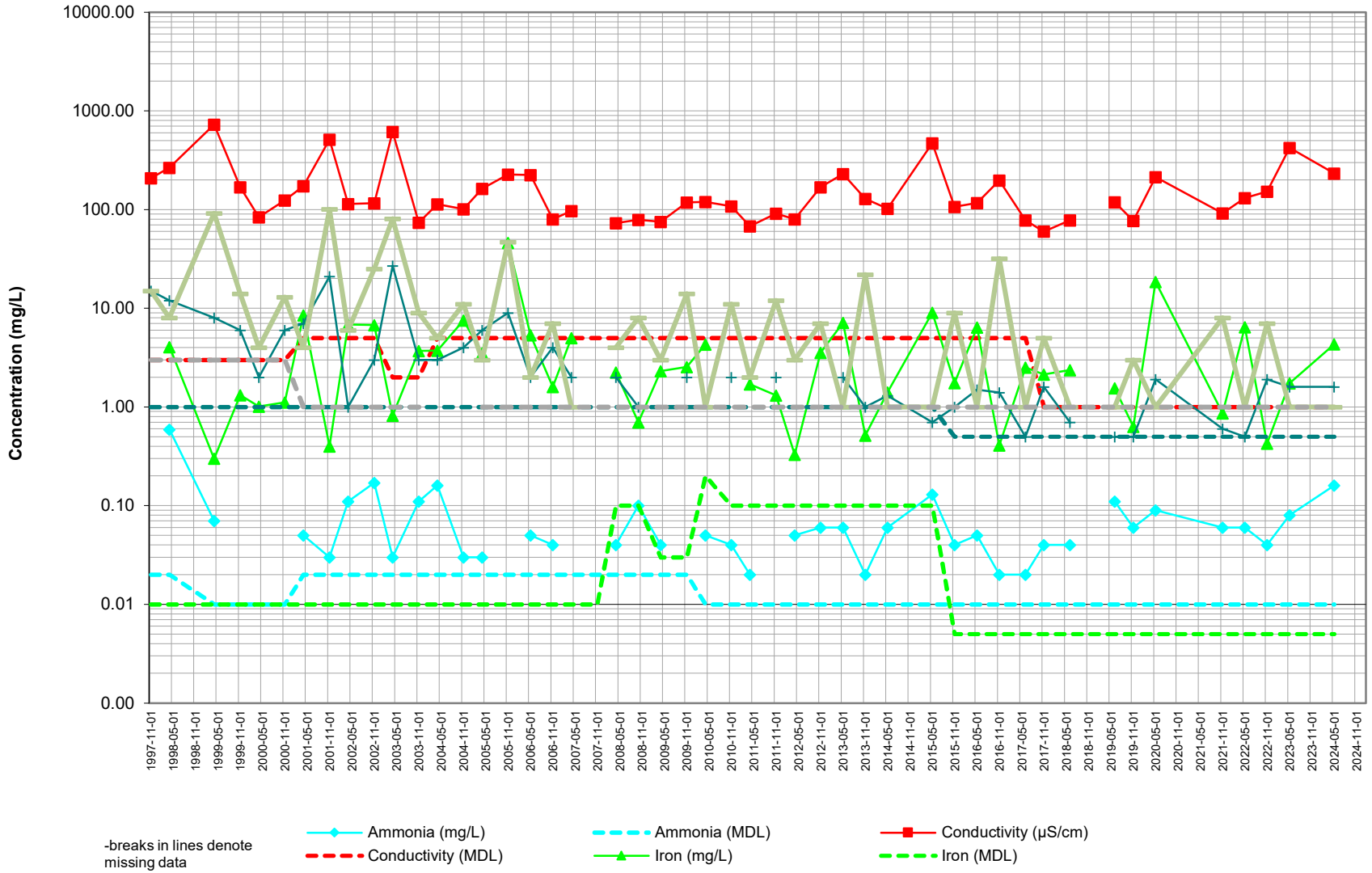
Groundwater Quality Trends
Monitor MW-8a



-breaks in lines denote missing data

Surface Water Quality Trends
Station SW-DU



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Appendix G
Trigger Mechanism

Reasonable Use Development

As discussed in 1996 and in the 2003 annual report, we again remind the reader that caution should be exercised in applying MOEE Guideline B-7 to this site. The site chemistry is complex, and naturally high background concentrations are found as a result of the evaporitic minerals. The fact that the groundwater is not used for potable purposes within 1 kilometre of the site[7] attests to the fact that insufficient water is available from the bedrock and wells that encounter water deem it non-potable due to the naturally high mineralization. The residents within 1 kilometre of the site are on shore wells[3] for these reasons.

The following is an updated summary discussing the application of MOEE Guideline B-7 to the Amherst Island waste disposal site.

Significant variation in natural groundwater quality exists in the Amherst Island area as explained by Malroz[7] (1996) due to patchy distribution of evaporitic anhydrites. Wells that have high mineralization as a result of contact with the evaporitic anhydrite minerals are referred to as salty, and usually have, amongst other parameters, high levels of sodium and chloride. Three attempts have been made in the past to establish an up-gradient background well and the wells exhibited salty or dry conditions.

In order to establish a background well for the application of MECP Guideline B-7 and calculation of reasonable use contaminant limits per procedure B-7-1, wells either off-gradient or far down-gradient were examined. The dug wells D-E and D-W were eliminated from the evaluation because these wells are open to the elements and not secure from anthropogenic influences. Open boreholes BH5 and BH6 were eliminated from the evaluation as both these wells are considered salty. Monitoring wells MW-TP4, MW-8, MW-2, and MW-TP3 were also eliminated from the evaluation as they are proximal to the landfill and may have leachate influence. Monitoring well MW-7a was used to establish background concentrations because it is non-salty, and the chemistry does not show leachate impact.

Monitoring well MW-7a has been sampled approximately 56 times since 1993, providing a good basis for establishing background concentrations. Some parameters, such as boron, were added to the sampling suite later and as a result have a smaller data set. Typical leachate parameters chloride, sodium, iron, TDS and boron were selected for application of procedure B-7-1. The results of the analyses show a maximum reasonable concentration (Cm) for chloride to be 141 mg/L, sodium to be 110 mg/L, iron to be 0.16 mg/L, TDS to be 465 mg/L and boron to be 1.29 mg/L (refer to Table G1).

Concentrations of trigger mechanism parameter TDS exceeded the reasonable use concentrations at the trigger well (MW-1a) during the spring sampling event. The concentration of TDS was within the historical range of results. MW-1a was observed to have dry conditions during the fall sampling event and could not be sampled. Therefore, as of November, the site is not in compliance with the reasonable use policy.

[7] Hydrogeologic Study, 1996. Prepared for The Township of Amherst Island, February, 1996, by Malroz Engineering Inc

Trigger exceedances for iron during the spring sampling event were reported at MW-1a in 2023. The concentration of iron met the trigger concentrations during the spring 2024 sampling event.

Concentrations of the trigger mechanism and reasonable use concentrations should continue to be evaluated in 2025 to determine if the 2024 TDS result from the spring sampling event was anomalous or indicative of an emerging trend.

Application of the Cm to the interim trigger well MW-1a is included in Table G2.

Table G1
Reasonable Use Calculation

Sample ID	Sample Location	Sampling Date	Sodium	Chloride	Iron	TDS	Boron
Units			mg/L	mg/L	mg/L	mg/L	mg/L
PWQO	-	-			0.3		0.2
ODWS =(Cr)	-	-	200	250	0.3	500	5
	-	-	AO	AO	AO	AO	CS (IMAC)
Typ. Leachate MOEE	-	-	-	20 - 2500	-	-	0.5-10
93-W-005	MW-7a	1993-10-27	14.1	17.8	0.948	-	-
93-W-015	MW-7a	1993-12-16	14.9	21	12.9	-	-
95-W-002	MW-7a	1995-12-19	12.6	24.8	0.023	-	0.097
97-W-002	MW-7a	1997-11-12	9	18	0.16	424	-
98-W-002	MW-7a	1998-04-30	9	15	0.19	350	-
98-W-009	MW-7a	1998-11-04	9	30	0.07	470	-
99-W-001	MW-7a	1999-04-28	10	29	0.01	440	-
99-W-007	MW-7a	1999-11-24	13	39	0.01	480	-
00-W01	MW-7a	2000-04-24	12	30	0.04	470	-
00-W10	MW-7a	2000-11-30	13	29	0.02	500	-
01-W003	MW-7a	2001-04-25	20	21	0.01	426	-
01-W09	MW-7a	2001-11-29	13	32	0.6	487	-
02-W004	MW-7a	2002-04-17	11	26	0.01	443	-
02-W011	MW-7a	2002-11-27	14	41	0.17	510	-
03-W001	MW-7a	2003-04-25	11	39	0.03	463	-
03-W09	MW-7a	2003-11-19	19	37	0.06	492	-
04-W-003	MW-7a	2004-04-28	15	41	0.01	443	-
04-W10	MW-7a	2004-11-25	12	27	0.01	443	-
05-W03	MW-7a	2005-04-20	20	66	1.14	471	-
05-W10	MW-7a	2005-11-02	17	69	18.3	512	-
06-W03	MW-7a	2006-05-09	21	84	1.48	535	-
06-W014	MW-7a	2006-11-02	15	29	0.1	306	-
07-W06	MW-7a	2007-04-30	21	57	0.1	464	-
07-W011	MW-7a	2007-11-22	20	42	0.1	497	-
08-W006	MW-7a	2008-04-30	19	45	0.03	402	-
08-W013	MW-7a	2008-10-29	27	44	0.03	501	-
09-W005	MW-7a	2009-04-21	22.9	39	0.2	310	0.05
09-W013	MW-7a	2009-11-30	24.4	45	0.2	436	0.068
10-W005	MW-7a	2010-04-20	20.8	36	0.2	384	0.055
10-W012	MW-7a	2010-11-26	12.9	28	0.1	364	0.050
11-W005	MW-7a	2011-04-14	15.7	25	0.1	437	0.052
11-W0012	MW-7a	2011-11-28	24.3	32	0.1	446	0.052
12-W004	MW-7a	2012-04-24	23.4	27	0.2	531	0.077
12-W011	MW-7a	2012-11-21	26.8	46	0.006	399	0.041
13-W005	MW-7a	2013-05-13	25.9	28	0.1	340	0.042
13-W011	MW-7a	2013-11-12	26.2	80	0.1	500	0.057
14-W005	MW-7a	2014-05-08	17.1	16.8	0.005	314	0.036
14-W010	MW-7a	2014-11-07	21.1	65.6	0.005	454	0.057
15-W006	MW-7a	2015-05-20	21.6	37.5	0.005	370	0.021
15-W010	MW-7a	2015-11-06	22	40.0	0.005	377	0.067
16-W005	MW-7a	2016-05-03	20.6	22.1	0.005	327	0.007
16-W013	MW-7a	2016-11-30	25.4	66.1	0.005	450	0.047
17-W008	MW-7a	2017-06-07	20.3	14.6	0.005	333	0.049
17-W015	MW-7a	2017-11-02	11.9	11.2	0.005	251	0.049
18-W003	MW-7a	2018-06-06	19.1	19.3	0.008	297	0.049
18-W011	MW-7a	2018-10-31	24.1	44.0	0.005	408	0.063
19-W007	MW-7a	2019-06-05	16.1	18.6	0.005	297	0.047
19-W014	MW-7a	2019-11-07	12.6	20.8	0.005	256	0.045
20-W004	MW-7a	2020-05-28	18.6	16.5	0.008	283	0.040
20-W009	MW-7a	2020-11-11	23.1	76.3	0.01	455	0.057
21-W004	MW-7a	2021-05-27	16.6	21.1	0.005	303	0.048
21-W011	MW-7a	2021-11-19	16.0	31.6	0.005	320	0.055
22-W004	MW-7a	2022-05-27	23.5	32.4	0.005	312	0.033
22-W012	MW-7a	2022-11-24	16.7	59.2	0.005	388	0.048
23-W004	MW-7a	2023-05-18	15.5	24.7	0.005	323	0.048
23-W009	MW-7a	2023-11-28	30.2	88.3	0.018	471	0.060
24-W005	MW-7a	2024-05-31	18.7	38.3	0.005	352	0.053
24-W008	MW-7a	2024-11-25	21.4	67.4	0.051	430	0.062

Data Input: RF
Data Check: RG

denotes result was below the reporting limit and the value of the R.L. was adopted to allow for statistical analyses

	median Cb	19	32	0.02	430	0.05
	min	9	11.2	0.005	251	0.007
Cm=Cb+x(Cr-Cb)	Cm(normal)	110	141	0.16	465	1.29

Cb = background concentration
x = constant 0.5 non health parameter, 0.25 for health parameter
Cr = max conc. acceptable in water (ODWS)
Cm = max degradation
AO denotes asthetic objective, CS denotes chemical standard, IMAC denotes Interim Maximum Acceptable Concentration

Table G2

Application of Cm to MW-1a

Parameter	Monitoring Well Sample ID Date Units	MW-1a 24-W004 2024-05-31	MW-1a - 2024-11-25	Maximum Concentration (Cm)
Sodium	mg/L	37.2	dry conditions	110
Chloride	mg/L	80.1		141
Iron	mg/L	0.005		0.16
TDS	mg/L	501		465
Boron	mg/L	0.190		1.29

Data Input: RF
Data Check: RG