

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	TRI-R Committee Landfill Site
Location (e.g. street address, lot, concession)	141 Chetwynd Road, Part Lots 8 and 9, Concession 8, Township of Armour, District of Parry Sound
GPS Location (taken within the property boundary at front gate/ front entry)	NAD 27, Zone 17, Easting: 625700, Northing 5053355.
Municipality	Township of Armour
Client and/or Site Owner	The Corporation of the Village of Burk's Falls
Monitoring Period (Year)	2024
This Monitoring Report is being submitted under the following:	
Certificate of Approval No.:	A521003
Director's Order No.:	NA
Provincial Officer's Order No.:	NA
Other:	NA

Report Submission Frequency	☒ Annual ☐ Other	Specify (Type Here):
The site is:	☒ Active ☐ Inactive ☐ Closed	
If closed, specify C of A, control or authorizing document closure date:		Select 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
BH03-3	Monitoring well had insufficient water for sample collection.	May and September 2024
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

3) a) Some or all groundwater, leachate and WDS gas sampling and monitoring requirements have been established or defined outside of a ministry C of A, authorizing, or control document.		☒ Yes ☐ No ☐ Not Applicable	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:		☒ 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	
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	If no, specify (Type Here):	

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	If no, list and explain exceptions (Type Here):	
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	If no, list exceptions and explain reason for increase/change (Type Here):	
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>i.</i> The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and <i>ii.</i> Seasonal and annual water levels and water quality fluctuations are well understood.	☒ Yes ☐ No	Note which practice(s):	☐ (a) ☒ (b) ☒ (c)
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	☒ Yes ☐ No ☐ Not Applicable	Total phosphorus (0.05 to 0.67 mg/L) exceeded trigger concentration for one event in September 2024 at compliance points BH03-1, BH03-2, BH07-1, and BH07-2 as a result of background conditions. No remedial actions required.	

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

☒ No changes to the monitoring program are recommended

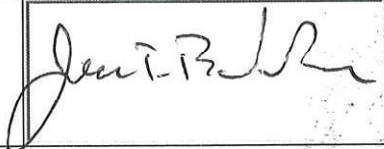
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☐ The following change(s) to the monitoring program is/are recommended:

☒ No Changes to site design and operation are recommended

Type Here

☐ The following change(s) to the site design and operation is/are recommended:

Name:	Jason T. Balsdon		
Seal:	Add Image 		
Signature:		Date:	18-Jan-2025
CEP Contact Information:	905-836-1119		
Company:	ResEnv Consulting Limited		
Address:	14336 County Road 21, Colborne, Ontario K0K 1S0		
Telephone No.:	905-836-1119	Fax No. :	NA
E-mail Address:	resenvcl@gmail.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)	Magnetawan River	
Distance(s)	At southern site 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	If no, identify issues (Type Here):
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
S1, S2, S4, S5, S6, S7, S8, S9, SW1, SW2	Landfill staff were unable to complete the November monitoring event owing to snow and ice cover.	November 2024
S1, S2, S4, S5, S6, S7, S8, and S9	Landfill staff were unable to complete the June, July, August, and October monitoring for flow rates and field parameters.	4 months in 2024

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.		☐ 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
Type Here	Type Here		Select Date
Type Here	Type Here		Select 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	If no, specify (Type Here):	

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):

☐ Yes

☒ No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO
Iron	PWQO and Trigger Criteria	Exceeds PWQO and Trigger Criteria by up to about 2 X, but background also exceeds PWQO and Trigger Criteria.
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
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	Watercourse erosion.

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	Leachate constituent concentrations in surface water within the on-site watercourses are similar to historic results. Some concentrations continue to exceed trigger concentrations as a result of background surface water quality and erosion of watercourse. See Section 4.4 of 2024 Annual Monitoring Report.
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	Total phosphorus concentrations in groundwater adjacent to river periodically exceeded PWQO as a result of background conditions. No remedial measures required. See Section 4.3 of 2024 Annual Monitoring Report.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	☒ Yes ☐ No ☐ Not Applicable	Some concentrations continue to exceed trigger concentrations as a result of background surface water quality and erosion of watercourse. See Section 4.4 of 2024 Annual Monitoring Report.

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

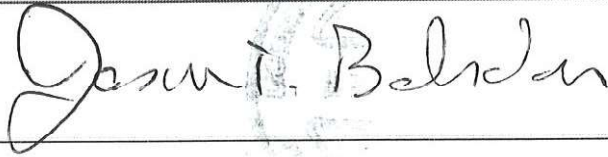
I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

☐ No Changes to the monitoring program are recommended ☒ The following change(s) to the monitoring program is/are recommended:	To allow for an improved comparison between groundwater quality and surface water quality it was recommended that both groundwater and surface water be monitored in May and September of each year. This change would move the August and November surface water monitoring events to one event in September. The May surface water monitoring event would remain unchanged. The June, July, and October flow rate and field monitoring would be removed.
☒ 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	Geological Engineer	
Date:	18-Jan-2025	
CEP Contact Information:	Jason T. Balsdon	
Company:	ResEnv Consulting Limited	
Address:	14336 County Road 21, Colborne, Ontario K0K 1S0	
Telephone No.:	905-836-1119	
Fax No. :	NA	
E-mail Address:	resenvcl@gmail.com	
Save As		Print Form

TRI-R LANDFILL SITE 2024 ANNUAL MONITORING REPORT

Prepared for:
Township of Armour
P.O. Box 533
Burk's Falls, Ontario
P0A 1C0

Project No. 13-004-00

Distribution:
1 ec MECP
1 ec Township of Armour
1 ec File

ResEnv Consulting Limited

January 20, 2025

Township of Armour
P.O. Box 533
Burk's Falls, Ontario P0A 1C0

Attention: Ms. Amy Tilley
Waste Management Administrator

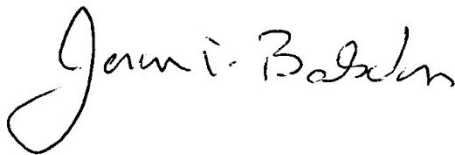
**Re: TRI-R Committee Landfill
2024 Annual Monitoring Report - DRAFT
File 13-004-00**

ResEnv Consulting Limited is pleased to submit this 2024 Annual Monitoring Report. This report was prepared in accordance with Conditions 53 and 54 of the Amendment to Environmental Compliance Approval No. A521003 and Condition 7 of the Certificate of Approval Municipal and Private Sewage Works Number 6402-854LHL.

A summary of the findings is presented in the executive summary at the front of the report. Details are provided in the report text and technical data are appended.

Thank you for the opportunity to participate in this assignment. Please contact us if you have any questions.

Yours truly,
ResEnv Consulting Limited



Jason T. Balsdon, M.A.Sc., P.Eng.
Consulting Engineer

EXECUTIVE SUMMARY

The Township of Armour operates a municipal landfill (TRI-R Landfill Site) located on Part Lots 8 and 9, Concession 8, Township of Armour, District of Parry Sound, on behalf of the municipalities of Burks Falls, Armour, and Ryerson. Operations are in accordance with Amendments to Environmental Compliance Approval Number A521003 (Waste ECA) and Certificate of Approval Municipal and Private Sewage Works Number 6402-854LHL (Sewage CofA).

The existing landfill site is licensed to receive municipal, solid, non-hazardous waste. The footprint of the approved waste area is approximately 1.73 hectares (ha) and has an approved capacity of 86,500 cubic metres (m³) of waste, excluding final cover. The waste area is located on the south side of a hill that contains a former landfill disposal area, and is being filled in a westerly and vertical direction. The top elevation of the landfill approximates the top of the hill on the site. The total site area is approximately 20.2 ha and is bounded to the north by Chetwynd Road and to the south by the Magnetawan River. This report provides details of the monitoring and operations for the TRI-R Landfill Site from January 1 to December 31, 2024, in accordance with the Waste ECA and the Sewage CofA.

A landfill monitoring program has been ongoing at the TRI-R Landfill Site since February 2001. The monitoring locations, parameters for analysis, and sampling frequency have changed over time in response to public input, the Waste ECA, and the Sewage CofA.

A drone survey was completed on August 29, 2024, which indicated the placement of 862.4 m³ of waste since the previous survey of August 30, 2023 (12 month period). A total of 13,061.9 m³ of waste capacity (excluding final cover) remains. Based on a waste capacity utilization rate of about 1,500 m³, it is estimated that the available waste capacity will allow for approximately nine (9) more years of waste disposal, until early 2033. It is noted that this approximation may vary with increases or decreases in waste disposal volume.

Groundwater and surface water continue to move in a downslope direction toward the Magnetawan River to the south. Leachate management is achieved through the operation and maintenance of a Leachate Seep Control System and a landfill attenuation zone located between the waste footprint and the Magnetawan River. Landfill leachate quality in 2024 was generally within the range of historic leachate quality, except for elevated concentrations of conductivity, alkalinity, chloride, and ammonia, and low concentrations for total dissolved solids (TDS). A general increasing concentration trend with time was apparent for chloride, boron, and ammonia.

The existing landfill site is not causing an unacceptable impact on the local shallow and deep groundwater resources at the downgradient attenuation zone boundary with the Magnetawan River. Thus, the landfill attenuation zone is effective in protecting groundwater resources.

Historic leachate seeps were removed with the construction of the Leachate Seep Control System. Water that currently accumulates near the toe of the Leachate Seep Control System originates from runoff as well as intermittent groundwater seepage. The improvement in surface water quality adjacent to the Leachate Seep Control System observed in 2011 through 2023 was also observed in 2024. Some water quality effects from the landfill are apparent within the intermittent watercourses immediately adjacent to the Leachate Seep Control System, but parameter concentrations decrease within the landfill attenuation zone. Surface water quality downstream of the waste footprint and operation areas is affected by erosion during watercourse geomorphological changes as well as by groundwater recharge or discharge, but unacceptable landfill leachate effects were not detected in surface water at the downstream boundary of the landfill attenuation zone. The surface water quality within the Magnetawan River also does not show landfill leachate effects.

It is recommended that in 2025 the Leachate Seep Control System should continue to be operated and maintained in accordance with the Operations and Maintenance Manual. Maintenance should include the infilling of erosional gullies and the planting of Higher Aquatic Plants in areas of sparse plantings and along the edges of the sand mantles where some periodic water discolouration was observed in 2024.

Groundwater and surface water monitoring and reporting should continue in 2025 as outlined in Section 9 of this report. It is recommended that the surface water monitoring component of the monitoring program be modified to focus on two water quality sampling events in May (continues the historic May sampling) and September (combines the historic August and November sampling), with the removal of the June, July, and October flow rate monitoring events (historically no sampling completed at this time). This modification will bring the surface water monitoring frequency in line with the current groundwater monitoring frequency.

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1. INTRODUCTION

1.1 BACKGROUND

The Township of Armour operates a municipal landfill (TRI-R Landfill Site) located on Part Lots 8 and 9, Concession 8, Township of Armour, District of Parry Sound, on behalf of the municipalities of Burks Falls, Armour, and Ryerson. A Site Location map is provided in Figure 1. Copies of the following approval documents are provided in Appendix A.

- Amendments to Environmental Compliance Approval A521003, dated March 28, 2017 (Notice No. 3), April 9, 2014 (Notice No. 2), November 15, 2011 (Notice No. 1), and June 8, 2011 (no notice number) (Waste ECA)
- Certificate of Approval Municipal and Private Sewage Works Number 6402-854LHL, dated August 20, 2010 (Sewage CofA)

The existing landfill site is licensed to receive municipal, solid, non-hazardous waste. The footprint of the approved waste area is approximately 1.73 hectares (ha) and has an approved capacity of 86,500 cubic metres (m³) of waste, excluding final cover. The waste area is located on the south side of a hill that contains a former landfill disposal area, and is being filled in a westerly and vertical direction. The top elevation of the landfill approximates the top of the hill on the site. The total site area is approximately 20.2 ha and is bounded to the north by Chetwynd Road and to the south by the Magnetawan River. This report provides details of the monitoring and operations for the TRI-R Landfill Site from January 1 to December 31, 2024, in accordance with the Waste ECA and the Sewage CofA.

A landfill monitoring program has been ongoing at the TRI-R Landfill Site since February 2001. The monitoring locations, parameters for analysis, and sampling frequency have changed over time in response to public input, amendments to the former Provisional Certificate of Approval and the more recent Waste ECA, and the Sewage CofA.

1.2 OBJECTIVES AND SCOPE

The primary objectives of the 2024 Annual Monitoring Report are as follows.

- To comply with Conditions 53, 54, 63, 68, and 69 of the Waste ECA and Condition 7 of the Sewage CofA.
- To determine current groundwater and surface water conditions and to determine groundwater movement on this landfill site.
- To evaluate potential effects of the landfill site on the local water resources.

- To assess the performance of engineered facilities, modify the site design or operations if required, and to assess the need for contingency measures.
- To document site operations in 2024.

This report provides an evaluation of site conditions in 2024. Environmental conditions are not static, but may change depending on site operations and weather conditions.

2. METHODOLOGY

The following groundwater and surface water monitoring was completed in accordance with the Waste ECA and the Sewage CofA. Details are provided in Table 1 and monitoring locations are shown in Figure 2.

- Borehole logs and associated monitoring well construction details are presented in Appendix B.
- Leachate and groundwater level measurements were obtained from the required monitoring wells on May 1 and September 30, 2024. Monitoring well BH03-3 was dry during the September monitoring event and flowing conditions were identified for monitoring well BH07-1 for the May monitoring event.
- Leachate quality monitoring was completed at BH15-1 on September 30, 2024.
- Groundwater quality sampling was completed on May 1 and September 30 for general chemical parameters at monitoring wells listed in Table 1. BH03-3 could not be sampled as it was either dry or had insufficient water during both sampling events. Monitoring wells were purged of three volumes of standing water or until dry prior to sampling. One exception was at BH07-1 in May when flowing conditions prevented the need for purging prior to sampling. Groundwater samples to be analysed for metals and dissolved organic carbon (DOC) were field filtered.
- Surface water monitoring was completed in May, September (replaced the August monitoring event), and November in accordance with the frequency and parameters noted in Table 1. During the November monitoring event, snow and ice cover prevented the collection of water samples. The June, July, August, and October monitoring events were not completed. Dry or no flow conditions during some monitoring events prevented the collection of some surface water samples.
- Surface water flow rates were measured manually owing to the low flow conditions of the onsite watercourses. The methodology included:

- Measuring the watercourse width at one location (one transect) for the station;
 - Measuring the water depth at the transect of the watercourse at three locations;
 - Using the width and depth measurements to calculate the area of surface water flow;
 - Determining the flow velocity of the surface water for 3 to 5 measurements; and
 - Using the average flow velocity and the area of flow to calculate the surface water flow rate.
- The quality assurance and quality control (QA/QC) program included the collection of a field-prepared, blind duplicate sample from monitoring well BH10-2 in May and BH07-1 in September.

Subsurface soil/fill/bedrock, groundwater, and surface water information are presented in Appendices B through F. Laboratory Certificates of Analysis are provided in Appendix G.

Monitoring was completed by landfill staff or by ResEnv Consulting Limited in May, September, and November. Findings were collated with site operations information and interpreted relative to historic results, trigger mechanisms, and regulatory standards, objectives, or guidelines, and documented in the following report.

3. HYDROGEOLOGIC SETTING

3.1 PHYSIOGRAPHIC SETTING

The landfill site is located within an area of bedrock knolls and low-lying areas. Surficial soil is variable and includes fine-grained material such as silt and clay, as well as coarse-grained material such as sand and gravel. Within the low-lying areas, fine-grained material results in poorly drained wetlands. Sporadic sand and gravel deposits also occur west of the Village of Burk's Falls.

Regional topography in the vicinity of the site ranges from 350 metres above sea level (m asl) north of the site to about 290 m asl to the southwest near the Magnetawan River. Within the site, the topography is about 337 m asl near the top of waste and about 291 m asl near the Magnetawan River. The waste footprint is on the south side of a hill as shown in Figure 2.

3.2 WASTE DISPOSAL FOOTPRINT

The limits of waste are based on the approved footprint per the Waste ECA. Most of the historic operation areas (historic burn area and historic metal storage area) are located within the waste

footprint. The two mantles for the Leachate Seep Control System are located adjacent to the waste footprint and/or operation areas.

Structures located between the site entrance and the waste footprint are shown in Figure 2.

3.3 GEOLOGIC SETTING

Borehole logs for the monitoring wells that are shown in Figure 2 are presented in Appendix B for reference. The local geology can be characterized by the following three units.

- i) Overburden – topsoil overlying sandy silt to sand;
- ii) Waste; and
- iii) Bedrock

i) Overburden

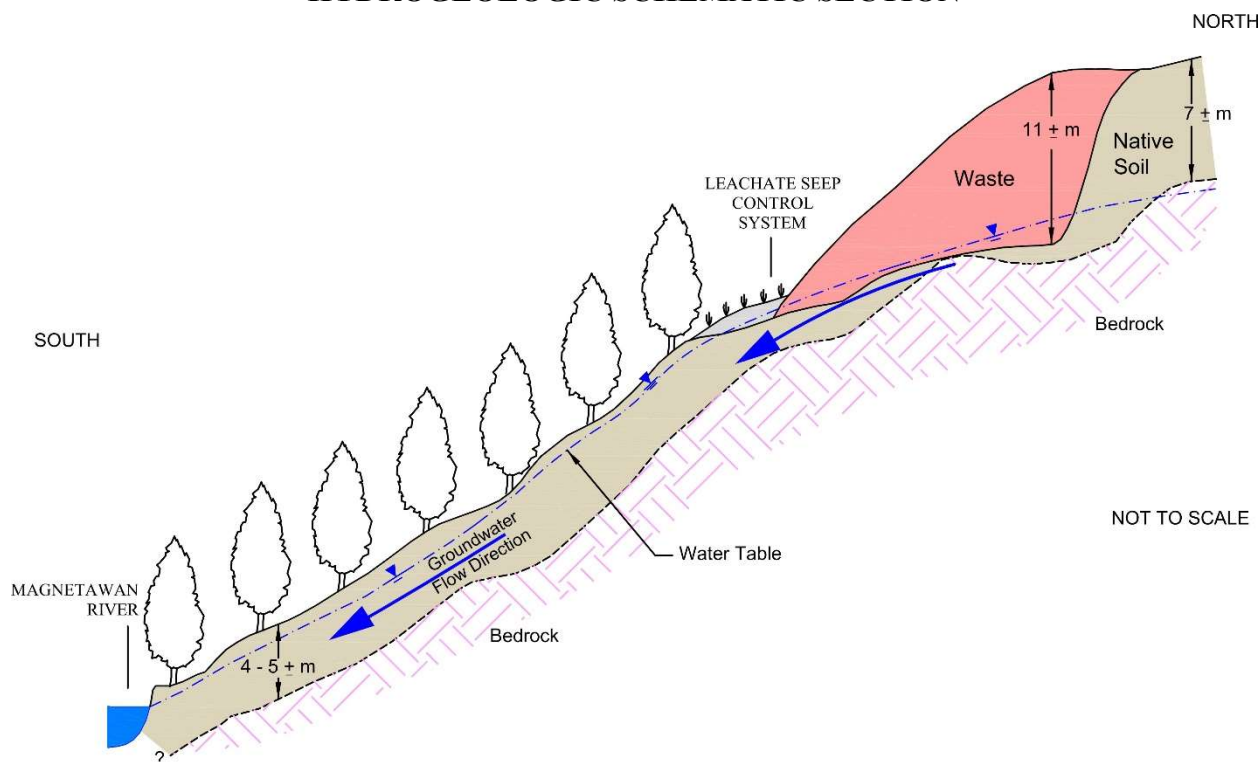
The onsite soil is typically sandy silt to sand overlying bedrock. Reportedly, the site was initially used as a sand and gravel borrow pit prior to waste disposal. Sandy silt to sand was intersected over bedrock north of the waste footprint at BH03-3, BH4, BH07-3, BH07-4, and BH10-2. Within the waste footprint at BH15-1 the borehole that was advanced through the waste intersected sand and gravel immediately overlying the bedrock. North of the waste footprint the thickness of the overburden ranges from less than 1 metre (m), with some bedrock exposures immediately north of Chetwynd Road, to 7.6 m at BH4, although this thickness also contains fill.

Sand was also detected overlying bedrock downslope of the waste footprint at BH10-1 and BH15-2. Some finer-grained material was detected overlying bedrock south of the waste footprint based on numerous shallow boreholes and testpits completed in 2006/2007 and at BH15-3. Where investigated the thickness of the overburden in this area ranges from non-existent (bedrock exposures) to 2.1 m at BH15-3.

Further downslope of the waste footprint, near the Magnetawan River, a thicker sand unit was detected at BH03-1, BH03-2, BH07-1, and BH07-2. This sand contains a greater gravel content than detected at other boreholes located closer to the waste footprint. Near the Magnetawan River the sand thickness ranges from 2.5 m to 4.6 m.

A schematic of the hydrogeological setting in the area of the waste footprint is provided below.

HYDROGEOLOGIC SCHEMATIC SECTION



ii) Waste

Waste was identified in borehole BH07-5, from ground surface to the top of the bedrock at 8.2 m below grade, and at BH15-1 to a depth of 13.7 m below grade. The former operation areas below the southwestern portion of the waste footprint contained some waste, ash, and soil.

iii) Bedrock

The bedrock subcrop ranges in elevation from about 336.2 m asl at BH07-4, which is located north of the waste footprint near Chetwynd Road, to about 289.0 m asl at BH03-1, adjacent to the Magnetawan River. Bedrock exposures and locations with bedrock less than 0.2 m below ground surface were identified on the site adjacent to the southeast face of the waste footprint.

At the borehole locations the bedrock consists of migmatite, which is a metamorphic rock that shows notable colour banding (white, pink, black) as well as layering of minerals. As a result of the metamorphism, the layering is contorted. Some felsic intrusions were noted that cut through the metamorphic layering. Fracturing was evident in the rock core retrieved from the boreholes, with the fractures oriented both perpendicular and inclined to the core axis. Discoloured rock along some fractures is attributed to weathering as a result of groundwater movement.

3.4 GROUNDWATER SETTING

Monitoring well information is presented in Table C-1 and groundwater elevation data available for the site are presented in Table C-2 and Figures C-1 to C-2, Appendix C.

3.4.1 Leachate Well and Monitoring Well Types

Based on the groundwater levels at the leachate wells and monitoring wells, the water table within the shallow monitoring wells (standpipes) occurs within the waste/overburden or within the bedrock where the overburden is thin or not present. In addition, when the water table level fluctuates on a seasonal basis the water table location can vary between the overburden and bedrock. The water table locations are summarized below.

GEOLOGIC MATERIAL	WATER TABLE MONITORING WELLS (STANDPIPES)	DEEPER MONITORING WELLS (PIEZOMETERS)
Waste or Waste/Overburden	BH2, BH07-5, BH15-1	
Overburden	BH3, BH03-1, BH03-2, BH03-3	
Overburden/Bedrock	BH10-1, BH10-2	
Bedrock	BH07-3, BH07-4, BH15-2, BH15-3	BH07-1, BH07-2

Downslope of the waste footprint near the Magnetawan River, two deep monitoring wells (piezometers) were installed at a greater depth below the water table and overburden to allow for monitoring of deeper groundwater that will move through the bedrock fractures and upward toward the base of the river. These two monitoring wells include BH07-1 and BH07-2.

3.4.2 Water Table and Shallow Groundwater Movement

The permeable nature of the waste/overburden allows for the unrestricted movement of groundwater and is interpreted to be hydraulically connected to the fractured bedrock. The shallow groundwater of the water table moves laterally through the waste/overburden and bedrock fractures from an area of high groundwater levels to an area of low groundwater levels. Thus, for interpretation purposes the water table presence within the waste, overburden, and bedrock is interpreted as a single, contiguous shallow groundwater system. In areas where the bedrock is exposed at surface and the lack of fractures restricts lateral groundwater movement, the shallow groundwater discharges at ground surface as seeps or springs. Seeps or springs also occur where the ground surface elevation has been lowered by erosion, such as within watercourses (e.g. ditches or low-lying areas). In some flatter locations along the reach of the onsite watercourses the surface water infiltrates into the subsurface and mixes with groundwater at the water table. Surface water from the site eventually discharges into the Magnetawan River as detailed in Section 3.6.

A shallow dug well is located north of the operation areas and the Leachate Seep Control System mantle as shown in Figure 2. This well is less than 3 m in depth and penetrates the water table.

Groundwater levels in the dug well are typically near ground surface, with water emanating from holes in the corrugated well casing and contributing to surface water within the onsite western watercourse upstream of station S6.

As expected, based on topography, the general direction of shallow groundwater movement is towards the south to the Magnetawan River. The inferred direction of groundwater movement for September 2024 is shown in Figure 2. In September 2024 the groundwater elevations ranged from approximately 334.48 m asl at the north end of the site (BH07-4) to 291.42 m asl at the south end of the site (BH03-2) adjacent to the Magnetawan River. Localized variations in the direction of groundwater movement occur as a result of the topography, fracture orientation, and watercourses.

In summary, shallow groundwater moves from the northern landfill site boundary toward the Magnetawan River. When this groundwater moves through or below the waste footprint or the operation areas the water quality is affected by mixing with leachate as discussed in Section 4.2. The area of land between the waste footprint and the Magnetawan River allows for some attenuation of these landfill effects and may be identified as the landfill attenuation zone as shown in Figure 3.

3.4.3 Deep Groundwater System

Near the Magnetawan River and downgradient edge of the attenuation zone, monitoring wells BH07-1 and BH07-2 are developed within the bedrock that underlies the overburden and associated water table. Thus, these two monitoring wells allow for the determination of deeper groundwater pressures, the direction and magnitude of vertical hydraulic gradients, and the quality of deeper groundwater.

3.4.4 Water Table Level Fluctuations

In 2024 the elevation of the water table and deeper groundwater pressures typically showed a seasonal fluctuation, with higher elevations during the spring (May) and lower elevations during the late summer and fall (September). This seasonal fluctuation is consistent with historic observations and is anticipated as a result of snowmelt and greater precipitation during the spring months that causes the water table to rise in elevation. During the drier summer months there is less infiltration of water, which causes the water table elevation to decrease.

3.4.5 Hydraulic Gradients

Based on the inferred groundwater elevation contours for the water table as presented in Figure 2, the southerly lateral hydraulic gradient is about 0.08 at the northern and southern areas of the landfill and about 0.16 in the central portion. Therefore, with a mean bulk hydraulic conductivity for the sand of about 2×10^{-6} m/s and an effective porosity of 0.25, the lateral velocity of

groundwater movement through the sand ranges from about 20 m/a to 40 m/a. With a mean bulk hydraulic conductivity for the fractured bedrock of about 2×10^{-5} m/s and an effective porosity ranging from 0.01 to 0.05, the lateral velocity of groundwater movement through the fractured bedrock ranges from about 50 m/a to 500 m/a.

Vertical hydraulic gradients at the site in 2024 were evaluated at the three monitoring well nest locations (BH03-1/BH07-1, BH03-2/BH07-2, and BH03-3/BH07-3). Although BH03-3 was dry in September 2024, historic data and data from May 2024 indicate downward hydraulic gradients at nest BH03-3/BH07-3. Therefore, based on groundwater levels and the site topography, it is inferred that a groundwater recharge area occurs north of Chetwynd Road and within the area of the northern portion of the landfill site at BH03-3, BH07-3, BH07-4, and BH10-2.

Upward hydraulic gradients were observed at nests BH03-1/BH07-1 and BH03-2/BH07-2 and indicate the upward movement of deeper groundwater through the bed of the Magnetawan River and into surface water. The presence of upward hydraulic gradients at BH03-1/BH07-1 is supported by the observation of flowing conditions at BH07-1 (groundwater level above grade) in May 2024. It is interpreted that the source of the water for the deeper groundwater system is the recharge area to the north, which includes the high area of land north of Chetwynd Road and the northern portion of the landfill site, including the waste footprint.

3.4.6 Compliance Monitoring Locations

Based on the monitoring well locations and the inferred direction of groundwater movement, the monitoring well locations relative to the waste footprint and attenuation zone shown in Figure 3 are identified as follows.

GROUNDWATER SYSTEM	MONITORING WELL LOCATION	MONITORING WELL DESIGNATIONS
Water Table	Upgradient or Background	BH03-3, BH07-3, BH07-4, BH10-2
	Leachate	BH07-5, BH15-1
	Downgradient Attenuation Zone - Between Waste Footprint and River	BH2, BH3, BH10-1, BH15-2, BH15-3
	Downgradient Attenuation Zone – Near River	BH03-1, BH03-2
Deeper Groundwater	Downgradient Attenuation Zone – Near River	BH07-1, BH07-2

3.5 GROUNDWATER USE

Seventeen (17) water well records are available for the area. The water wells were drilled into bedrock at depths of between about 45 m and 123 m below ground surface, where water was detected, and water quality is recorded as fresh.

No water wells identified in the Ministry of Environment, Conservation and Parks (MECP) Water Well Record database and during an historic water well reconnaissance survey are located downgradient of the landfill site. Thus, potential landfill effects to groundwater will not impact the local residential groundwater supply.

3.6 SURFACE WATER

Surface water on the landfill site originates from overland flow and groundwater baseflow.

3.6.1 Overland Flow

Ditches along Chetwynd Road manage runoff from the road and from land to the north. There is a component of runoff from the southern road ditch that contributes to an onsite eastern watercourse that extends along the eastern boundary of the landfill site as shown in Figure 3. A background surface water station, designated S5, was established within this eastern watercourse upstream of the waste footprint.

Background surface water also contributes to the eastern watercourse from two watercourses that originate on land to the east of the site. These two watercourses also cross Chetwynd Road further to the northeast, then join just east of the landfill site eastern boundary. In 2012 a background surface water station, designated S7, was established near this confluence. Station S7 was relocated closer to the eastern site boundary in 2013 as shown in Figure 3.

Overland flow to the western watercourse shown in Figure 3 has not been observed since monitoring commenced in 2001. As noted below, background water to the western watercourse originates as groundwater springs/seepage at or near the dug well.

3.6.2 Groundwater Baseflow

The groundwater baseflow component originates in the area of higher topography north of the site and from infiltration through soil and waste/fill within the northern portion of the site.

In areas where the bedrock is exposed at surface and the lack of fractures restricts lateral groundwater movement, the groundwater discharges at ground surface as seeps or springs. Seeps or springs also occur where the ground surface elevation has been lowered by erosion, such as within watercourses (e.g. ditches or low-lying areas). In some flatter locations along the reach of the eastern and western watercourses the surface water infiltrates into the subsurface and mixes with groundwater at the water table. Thus, the interaction of groundwater and surface water on the landfill site is dynamic and variable.

A shallow dug well is located north of the operation areas as shown in Figures 2 and 3. Groundwater levels in the dug well are typically near ground surface, emanating from holes in the corrugated well casing and contributing background surface water to the western watercourse.

3.6.3 Onsite Surface Water Flow – Eastern Watercourse

As noted above, background surface water for the eastern watercourse flows through stations S5 and S7. Surface water flow continues within the watercourse past stations S1 and S2 and continues to flow through station S4 and into the Magnetawan River. Thus, surface water monitoring stations S1, S2, and S4 allow for the progressive monitoring of surface water that flows through the attenuation zone downstream of the waste footprint toward the Magnetawan River. A new station designated S8 was established in 2014 at the base of a slope on land located between stations S2 and S4 to allow for the monitoring of potential groundwater seepage contribution to surface water in this area if it should occur. Surface water flow rates for 2024 are presented in Table F-1, Appendix F, and are summarized below. It is noted that surface water flow rates were not determined in 2024 during June, July, August, October, and November.

MONTH	OBSERVATIONS (S1,S2,S4,S5,S7)	FLOW RATES (L/s) (S1,S2,S4,S5,S7,S8)
May	Increasing flow from S5 to S4. Minor contribution of flow from S1 and no contribution from S8. Flow at S2 originates from groundwater discharge and overland flow from upstream of background station S7. Flow at S4 is lower/similar to flow at S2, which suggests no groundwater contribution to surface water along the watercourse.	S5 = 2 S1 = Low Flow S7 = 83 S8 = No Flow S2 = 39 S4 = 36
September	Increasing flow from S5 to S4. No contribution to flow from S1 or S8. Flow at S2 originates from groundwater discharge and overland flow from upstream of background station S7. Flow from S2 toward S4 increases as a result of groundwater contribution to surface water along the watercourse.	S5 = Dry S1 = No Flow S7 = 68 S8 = Dry S2 = 63 S4 = 94

In summary, land to the east of the site provides a notable contribution of flow to the eastern watercourse. Owing to periodic no flow conditions at station S5 in 2024, the eastern watercourse may continue to be characterized as intermittent. The contribution of groundwater baseflow to the watercourse varies depending on the prevailing weather conditions and their influence on groundwater levels. A detectable contribution of groundwater baseflow to the eastern watercourse was apparent for September. During May no groundwater contribution to surface water along portions of the watercourse was observed.

3.6.4 Onsite Surface Water Flow – Western Watercourse

In 2024 there was intermittent minor flow (no flow to 1 L/s) at station S6. Flow was only detected at downstream station S9, near the Magnetawan River, in May (9 L/s), which was greater than observed at station S6 and suggests groundwater discharge to surface water within the watercourse.

3.6.5 Magnetawan River

The Magnetawan River is a perennial river that flows in a westerly direction past the landfill site. The flow rate within the river will fluctuate on a seasonal basis. Station SW2 is upstream of the landfill attenuation zone and the discharge point of the eastern watercourse near station S4. Station SW1 is located downstream of the landfill attenuation zone and stations S4 and S9. Locations are shown in Figures 2 and 3.

Based on the hydraulic gradients below the landfill site, it is inferred that there is a groundwater baseflow component to the Magnetawan River. Considering an average saturated thickness of 2.7 m along the Magnetawan River, a bulk hydraulic conductivity of 2×10^{-6} m/s in the sand, and a lateral hydraulic gradient of 0.08, the lateral baseflow from the site into the river is about 14 m³/a per metre length along the river. Assuming an average channel width of 30 m, a bulk hydraulic conductivity of 2×10^{-5} m/s for fractured bedrock, and an upward vertical hydraulic gradient between 0.2 to 0.4, the upward groundwater baseflow contribution from the site to the river ranges from about 1,900 m³/a to 3,800 m³/a per metre length along the river. Therefore, for the 285 m length of river along the southern site boundary, the groundwater baseflow component is about 0.5 to 1.1 million m³/a, or about 0.1 % of the total river flow based on historic flow rate estimates.

3.6.6 Compliance Monitoring Locations

Within the attenuation zone shown in Figure 3, the surface water flow tends to vary on a seasonal basis as a result of changes in runoff, baseflow, and recharge to the water table. The eastern and western watercourses are the main drainage features on the landfill site and can be assessed at the downstream boundary of the attenuation zone at station S4 (eastern watercourse) and station S9 (western watercourse). Thus, stations S4 and S9 are the surface water Compliance Points for the attenuation zone. Monitoring of other stations upstream and within the attenuation zone allow for an assessment of natural water quality changes with time as well as the effectiveness of the attenuation zone.

4. WATER QUALITY

4.1 QUALITY ASSURANCE/QUALITY CONTROL

The water sampling program completed for this undertaking included a Quality Assurance/Quality Control (QA/QC) program which utilized blind duplicate samples from monitoring wells BH10-2 in May (DUP) and BH07-1 in September (Dup) to assess the precision of the chemical analysis of water samples. The groundwater and surface water samples were submitted to AGAT Laboratories, an accredited laboratory located in Ontario. The evaluation of the duplicate results is based on the U.S. Environmental Protection Agency (1988) guidance criteria for assessing laboratory precision for duplicate or replicate analyses.

A comparison was completed between samples and its field duplicate sample. The comparison target considered: 1) Relative Percent Differences (RPDs) for the results of a control limit of +/- 20% or 2) for concentrations less than five times the RDL, concentrations that vary by less than the reportable detection limit (RDL).

For the May sampling event only manganese and boron did not achieve the comparison target, while for the September sampling event only sulphate did not achieve the comparison target. However, as the concentration differences were minor and the other parameters satisfied the comparison targets, the QA/QC results indicate that the water quality results are suitable for interpretation.

4.2 LEACHATE

Leachate at the landfill site is produced primarily from the infiltration of precipitation into the waste, percolation of this water through the waste where the constituents typically increase in concentration, then movement of this leachate into the groundwater where the leachate and groundwater mix and move in a southerly direction through the landfill attenuation zone shown in Figure 3. The lateral movement of groundwater through the waste and fill of the operation areas also results in a typical increase in some constituent concentrations.

The historic general chemical results for the leachate samples collected at BH07-5 and leachate seeps, as well as the 2015 to 2024 general chemical results for leachate sampled from BH15-1 are presented in Table D-1, Appendix D, and are summarized in Table 2 for select parameters. The 2024 leachate concentrations at BH15-1 tended to be within the range of historic leachate concentration ranges, except for elevated concentrations of conductivity, alkalinity, chloride, and ammonia, and low concentrations for total dissolved solids (TDS).

Table 2 provides a summary for comparison of leachate quality with background groundwater and surface water quality. Based on this table, the following is a list of chemical parameters for the TRI-R Landfill Site that can be used as indicators of landfill leachate effects on groundwater and surface water quality.

• Conductivity • Hardness • Alkalinity • Chloride • Sulphate • Calcium • Magnesium • Potassium • Boron • Sodium • Iron	• Manganese • Ammonia • Nitrate • Dissolved Organic Carbon (DOC) • Phenols • Cadmium • Chromium • Copper • Lead • Phosphorus (total) • Zinc • Arsenic
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Figures D-1 to D-4, Appendix D, illustrate water quality changes with time for the following four leachate indicator parameters.

- Chloride – A mobile chemical that is typically used at landfill sites to represent the maximum extent of leachate migration in groundwater.
- Iron and Boron – Metals that can be used to represent the potential movement of other metals.
- Ammonia – Total ammonia is a good indicator of nutrient movement from landfill leachate.

The graphs indicate that in 2024 the concentrations of chloride, iron, boron, and ammonia were typically greater in leachate at BH15-1 than historically detected at BH07-5, but continued to fluctuate with time. Although the concentrations of chloride, boron, and ammonia fluctuated, they also showed a general increasing trend with time.

Figure 4 presents the groundwater quality for the monitoring wells on a Trilinear diagram. This Trilinear diagram considers the major ions in characterizing the leachate, groundwater, and surface water quality for May/September 2024. As shown in Figure 4, the proportion of major ions in leachate is characteristically different than detected within groundwater or surface water.

4.3 GROUNDWATER

In summary, groundwater moves from the northern landfill site boundary through the overburden/soil and fractured bedrock to the Magnetawan River. Monitoring wells BH03-3, BH07-3, BH07-4, and BH10-2 represent monitoring locations upgradient of the landfill waste/fill and provide background groundwater quality. Between the waste footprint and the river,

monitoring wells BH2, BH3, BH10-1, BH15-2, and BH15-3 allow for an assessment of leachate mixing with the shallow groundwater of the water table within the attenuation zone near the waste footprint and moving toward the Magnetawan River. Monitoring wells BH03-1 and BH03-2 (shallow groundwater) and monitoring wells BH07-1 and BH07-2 (deeper groundwater) are located near the downgradient boundary of the attenuation zone adjacent to the Magnetawan River.

Groundwater quality results for the monitoring wells on the site are summarized in Tables E-1 to E-2, Appendix E. Time-concentration graphs for the leachate indicator parameters chloride, iron, total ammonia, and boron are presented in Figures E-1 to E-8, Appendix E. Detailed laboratory results are provided in Appendix G.

Field test results for pH and conductivity are typically similar to higher than results obtained from the laboratory, with some exceptions. Groundwater temperatures typically range between 5.8 °C and 9.1 °C, which are reasonable for seasonal conditions in the spring and fall. One exception occurred for groundwater in May at BH2 where the groundwater temperature was 10.0 °C, likely as a result of landfill leachate effects. Turbidity values are also generally reasonable, with some elevated values that indicate the disturbance of sediment within the monitoring wells during purging and sampling or related to the colour of the groundwater at BH2 and BH3. The dissolved oxygen concentrations range from about 3.0 mg/L to 8.0 mg/L, with no apparent pattern over time or with location around the waste footprint.

4.3.1 Trilinear diagram

Figure 4 presents the leachate, groundwater, and surface water quality for the monitoring wells on a Trilinear diagram. This Trilinear diagram considers the major ions in characterizing the groundwater quality and presents data for May/September 2024. As summarized below, two dominant groupings can be approximated on the Trilinear diagram based on the plotted location of the monitoring wells.

1. Monitoring well BH07-3 represents background groundwater quality. BH10-2 plots outside this grouping dominantly owing to a greater proportion of alkalinity.
2. Monitoring wells BH07-1 and BH07-2 represent deeper groundwater quality within the bedrock.

The remaining wells show some scatter outside of the two groupings for shallow groundwater quality. BH15-3 plots notably beyond any of the groupings. Overall, the Trilinear diagram indicates a potential landfill leachate effect for groundwater at BH2, BH3, BH10-1, BH15-3 and possibly at BH03-1, BH03-2, and BH15-2. However, as discussed in the following subsections, groundwater quality at BH03-1, BH03-2, and BH15-2 is not impacted by landfill leachate.

4.3.2 Groundwater Quality Changes with Time

The time-concentration graphs for chloride, iron, total ammonia, and boron show the following concentration trends with time for shallow groundwater quality.

Upgradient

- Chloride concentrations fluctuate with time, with concentrations at background monitoring wells BH07-3 continuing to be elevated in 2024. It is noted that chloride concentrations at BH10-2 decreased since 2012 and are notably lower than chloride concentrations at BH07-3 since 2022.
- Iron concentrations also fluctuate at BH10-2 since 2015, although the iron concentrations continue to be elevated compared to the other upgradient monitoring location.
- Total ammonia concentrations are greater in groundwater at BH10-2, but show a pattern of decreasing concentrations since 2017.
- Background boron concentrations are generally low and constant over time.

Downgradient in Attenuation Zone – Between Waste and River

- Elevated chloride concentrations at BH2 show a general fluctuation since 2015, but remain elevated. The elevated chloride concentrations at BH3 are greater than background concentrations, while the elevated chloride concentrations at BH10-1 and BH15-2 continue to be within the range of chloride concentrations observed at background monitoring well BH07-3. This pattern indicates that chloride concentrations within the shallow groundwater decrease with distance from the waste footprint within the attenuation zone.
- Iron concentrations continue to fluctuate, typically with no apparent increasing or decreasing trends with time. Elevated iron concentrations occur at BH2 and BH3.
- The total ammonia concentrations in groundwater at BH3 continue to fluctuate at an elevated concentration and show an increase since 2014. At BH15-3 the total ammonia concentrations have decreased since 2016.
- Boron concentrations continue to be elevated at BH2, BH3, BH10-1, and BH15-3. Similar to the chloride concentrations, this pattern indicates that boron concentrations within the shallow groundwater decrease with distance from the waste footprint within the attenuation zone.

Downgradient in Attenuation Zone – Near River

- Near the Magnetawan River the concentrations of chloride, iron, total ammonia, and boron continue to be generally constant with time over the long-term within both the shallow and the deeper groundwater.

4.3.3 Groundwater Quality Differences with Location

Considering the groundwater quality results from 2024, the following discussion of spatial chemical patterns is presented.

i) Shallow Groundwater

Within the attenuation zone downgradient of the waste footprint, landfill leachate effects are apparent for the shallow groundwater quality. As expected, the water quality effects are greatest near the waste footprint and decrease with distance. This pattern is especially apparent for chloride and boron concentrations. Near the downgradient boundary of the attenuation zone, no detectable landfill leachate effects are apparent based on concentration changes with time relative to background groundwater quality.

ii) Deeper Groundwater

Within the deeper groundwater of the bedrock near the downgradient boundary of the attenuation zone (BH07-1 and BH07-2), groundwater quality continues to be similar with slightly greater concentrations within groundwater at BH07-1 compared to BH07-2. One pattern of note is slightly greater concentrations for some parameters in the deeper groundwater compared to shallow groundwater.

4.3.4 Comparison to Ontario Drinking Water Objectives

In response to requests from the general public and owing to the use of groundwater for domestic purposes upgradient and cross-gradient from the landfill site, a comparison of the 2024 groundwater quality with the Ontario Drinking Water Standards, Objectives, and Guidelines (June 2006) (ODWSOG) is provided in Table E-2, Appendix E. It is noted that no residential water wells are located directly downgradient of the landfill site.

Groundwater in some monitoring wells showed values that were below the minimum operating guidelines of the ODWSOG for pH and alkalinity. In 2024 other ODWSOG exceedances were detected as noted below.

PARAMETER	MONITORING WELL WITH ODWSOG EXCEEDANCE IN 2024
Sodium	BH2, BH3, BH10-1, BH15-3
Iron	BH2, BH3, BH10-2
TDS	BH2, BH3

These exceedances are not health-related parameters. It is noted that iron also exceeded its ODWSOG within background groundwater at BH10-2.

4.3.5 Guideline B-7 Assessment

Groundwater discharges to the Magnetawan River at the downgradient landfill site boundary. There are no existing or potential groundwater users within this attenuation zone between the landfill waste and the river. Therefore, the MECP Guideline B-7 for the Reasonable Use of Groundwater does not apply at the downgradient landfill site boundary.

4.3.6 Comparison to Trigger Criteria

As part of the water quality assessment in accordance with the Revised Contingency Plan (Genivar, 2012) and subsequent correspondence with the MECP (ResEnv, 2014), the groundwater quality for Compliance Points near the downgradient boundary of the attenuation zone about 30 m from the Magnetawan River was compared to the following Trigger Criteria. These Trigger Criteria are based on the Provincial Water Quality Objectives (1994 plus updates) (PWQO) or background surface water quality at stations S5 and S7. It is noted that even with an exceedance of a Trigger Criterion, the 30 m attenuation distance to the river would provide additional attenuation capacity to further reduce the concentrations within the groundwater prior to discharge into the river.

PARAMETER	TRIGGER CRITERIA	BACKGROUND GROUNDWATER (BH07-3 and BH10-2)	SHALLOW GROUNDWATER (BH03-1 and BH03-2)	DEEPER GROUNDWATER (BH07-1 and BH07-2)
Chloride	120	10.7 - 63	0.85 – 2.67	10.9 – 30
Ammonia (unionized)	0.02	<0.02 – 0.33	<0.02	<0.02
Iron	0.3	0.035 – 20.3	<0.020 – 0.055	<0.010 – <0.020
Boron	0.2	0.02 – 0.022	<0.010 – 0.03	0.027 – 0.048
Copper	0.005		<0.003	<0.003
Total Phosphorus	0.03		0.3 – 0.67	0.05 – 0.07
Zinc	0.02	<0.005	<0.005 – 0.006	<0.005 – 0.022

NOTES:

- 1) All concentrations are in mg/L.
- 2) Shading indicates concentration exceeds Trigger Criterion.
- 3) Trigger Criteria from Waste ECA.
- 4) Blank indicates parameters not analyzed.

The PWQO and Trigger Criteria were not exceeded within the groundwater for the shallow or deep groundwater in 2024, except for total phosphorus. As the historic background concentrations for total phosphorus also exceeded the Trigger Criterion, the PWQO and Trigger Criterion exceedances were not attributed to the landfill leachate. This conclusion is supported by the low concentrations of chloride and the other leachate indicator parameters at the Compliance Points. Therefore, there are no unacceptable landfill leachate effects near the downgradient attenuation zone boundary and no remedial actions or supplemental sampling are required. Monitoring in

2025 will allow for a further assessment of the 2024 Trigger Criteria exceedances and concentration trends with time.

For predictive purposes the groundwater quality at BH10-1, BH15-2, and BH15-3 was also compared to the Trigger Criteria. As the three monitoring wells are located greater than 200 m upgradient from the Magnetawan River this comparison allows for an assessment of potential landfill leachate effects on groundwater quality prior to additional attenuation where concentrations will continue to decrease. Only the boron concentration at BH10-1 and BH15-3 exceeded the Trigger Criteria. No Trigger Criteria exceedances were detected at BH15-2. Total phosphorus and copper were not analysed at these three monitoring wells in 2017 through 2024 in accordance with the Waste ECA. Based on the observed elevated parameter concentrations in groundwater at these three monitoring wells, there is an onsite leachate plume emanating from the landfill waste footprint and extending into the attenuation zone that should continue to be monitored.

4.3.7 Summary

Shallow groundwater moves through waste, overburden, and bedrock in a southerly direction toward the Magnetawan River and discharges into the river at the southern landfill site boundary. Deeper groundwater within the bedrock also moves in a southerly direction and near the downgradient boundary of the attenuation zone moves in an upward direction through the base of the river. There are no existing or potential downgradient groundwater users prior to groundwater discharge into the Magnetawan River.

The groundwater quality at background monitoring well BH10-2 continues to show elevated concentrations for some parameters compared to the expected groundwater quality in the area as observed at BH07-3. Chloride concentrations were also elevated within groundwater at BH07-3. The cause of the elevated concentrations is not attributed to landfill leachate based on the southerly direction of groundwater movement with a steep lateral hydraulic gradient and the downgradient location of the landfill waste footprint. It is apparent that the source of the elevated concentrations in groundwater is related to Chetwynd Road (e.g. road salt) and the associated drainage ditches and adjacent low-lying areas that can collect and transport runoff from other properties.

Elevated concentrations of leachate constituents were detected within groundwater below the operation areas, and concentrations decreased within the attenuation zone in a downgradient direction from the landfill waste on the landfill site property. No increasing concentrations with time or elevated landfill-related constituent concentrations were detected in groundwater at monitoring wells near the Magnetawan River. The shallow and deep groundwater quality near the river was similar or showed lower concentrations compared to background groundwater quality upgradient of the landfill waste and operation areas. Based on these results, the existing area around the landfill waste provides a high level of attenuation within the subsurface for the landfill

leachate constituents and no unacceptable landfill leachate effects on groundwater quality occur at the downgradient attenuation zone boundary.

4.4 SURFACE WATER

Surface water quality results for the monitoring stations are summarized in Tables F-1 to F-2, Appendix F. Graphs of concentration versus time for chloride, boron, iron, total phosphorus, total ammonia, TKN, and nitrate are shown in Figures F-1 to F-7, Appendix F. To assist in the assessment of surface water quality changes within the eastern watercourse, graphs that present concentration changes with distance from the waste footprint are provided in Figure F-8 through F-11, Appendix F. Detailed laboratory results are provided in Appendix G.

Station S5 is located upstream of the waste within an intermittent watercourse that originates along Chetwynd Road and that eventually flows into the Magnetawan River. This watercourse is identified as the onsite eastern watercourse. Monitoring stations S1, S2, and S4 are located within the eastern watercourse, but are located downstream of the waste footprint and within the landfill attenuation zone as shown in Figures 2 and 3. A new station designated S8 was established in 2014 at the base of a slope between stations S2 and S4 to allow for the monitoring of groundwater seepage contribution to surface water in this area if it should occur. A secondary watercourse that originates east of the landfill site also contributes to the eastern watercourse at a location upstream of station S2. A background surface water station was established within this watercourse in late 2012 and is designated S7.

An onsite western watercourse originates from a groundwater seep/spring at or near the dug well and extends around the western edge of the operation areas. Surface water flows from the dug well, through station S6, and eventually recharges the groundwater and/or contributes to the Magnetawan River near downstream station S9.

Runoff and groundwater baseflow within the attenuation zone downgradient of the waste footprint and operation areas will contribute water to the two watercourses. During periods of the year when the water table decreases in elevation the surface water may also contribute to groundwater.

Station SW2 is located in the Magnetawan River upstream of the landfill site attenuation zone and the discharge point for the eastern watercourse (station S4), and station SW1 is located in the river downstream of the landfill site.

4.4.1 Flow Rates

Details on the surface water flow rates are presented in Section 3.6. In summary, land to the east of the site provides a notable contribution of background flow to the intermittent eastern watercourse. The contribution of groundwater baseflow to the watercourse varies depending on

the prevailing climatic conditions and their influence on groundwater levels. A detectable contribution of groundwater baseflow to the eastern watercourse was apparent for September.

Occasional ponded water (no flow) conditions were observed along the eastern watercourse. The source of this ponded water may originate from runoff and groundwater discharge. As the ponded water is exposed to evaporation and other chemical changes, any samples of the ponded water would not be representative of water moving through the surface water system or contributing flow to Magnetawan River. Therefore, water samples were not collected during no flow conditions.

In 2024 there was intermittent minor flow (no flow to 1 L/s) at station S6. Flow was only detected at downstream station S9, near the Magnetawan River, in May (9 L/s), which was greater than observed at station S6 and suggests groundwater discharge to surface water within the watercourse.

The Magnetawan River is a perennial river that flows in a northwesterly direction past the landfill site. The flow rate within the river fluctuates on a seasonal basis.

4.4.2 Field Chemical Results

Field testing results for pH and conductivity are typically similar or slightly lower than the laboratory results. Turbidity and dissolved oxygen values varied with time and location, with no apparent pattern.

Field chemical results for surface water within the Magnetawan River are generally similar (stations SW1 and SW2) and do not indicate a general pattern in a downstream direction. Within the onsite eastern watercourse, surface water conductivity, turbidity, and dissolved oxygen values also varied from the upstream to the downstream stations. Surface water at the discharge point of the eastern watercourse (station S4) also showed no consistent pattern in values compared with the surface water within the Magnetawan River at downstream station SW1.

4.4.3 Surface Water Quality at Downstream Toe of Leachate Seep Control System

In 2024 there was sufficient surface water flow (low flow) near the toe of the Leachate Seep Control System at station S1 only in May for representative sample collection. A sample was also collected at station S6 in May, although the sample was also collected during low flow (<1 L/s). Figures F-1 through F-11, Appendix F, show that for most parameters, concentrations in surface water are greater near the toe of the Leachate Seep Control System and concentrations typically fluctuate with time on a year to year basis and from event to event. One useful method to determine if fluctuating concentrations are increasing or decreasing with time is through the use of moving annual averages. This method involves the following process:

- i. Year 1 - determine the concentration average for the monitoring events of the first year of monitoring;
- ii. Year 2 - determine the concentration average for the monitoring events of the first and second year of monitoring;
- iii. Year 3 - determine the concentration average for the monitoring events of the first, second, and third year of monitoring;
- iv. Subsequent Years – continue the averaging methodology.

If fluctuating concentrations are increasing in concentration with time, the moving annual averages will also increase in concentration with time. Alternatively, if fluctuating concentrations are decreasing in concentration with time, the moving annual averages will also decrease in concentration with time. If concentrations are fluctuating with no overall change with time, the moving annual averages will be similar from year to year.

Moving annual averages for select leachate indicator parameters at stations S1 and S6 are presented in Figures 5 through 11. For comparison purposes, the leachate concentrations from leachate monitoring well BH15-1 are listed below.

- Chloride – 32.6 to 80.0 mg/L
- Boron – 0.187 to 1.53 mg/L
- Iron – 0.511 to 402 mg/L
- Total Phosphorus – 0.26 to 16.5 mg/L
- Total Ammonia – 0.18 to 91.4 mg/L
- TKN – 1.2 to 103 mg/L
- Nitrate - <0.25 to 1.66 mg/L

At station S1 the data show a notable decrease in average concentrations with time for each of the parameters, except for chloride that shows a constant concentration with time. Similarly, at station S6 the parameters also show a general decrease in average concentrations with time, except for boron, iron, ammonia, and TKN which show no pattern. Nitrate average concentrations show a gradual increase with time. These average concentration patterns are expected since chloride is a conservative parameter and would typically not be attenuated within the Leachate Seep Control System, whereas the metals (boron and iron) and nutrients (total phosphorus, total ammonia, TKN, and nitrates) would be attenuated by the sand mantle, vegetation roots, and other processes.

In summary, based on the typical decrease in concentrations with time, it is apparent that the Leachate Seep Control System continues to be effective in partially treating the landfill leachate.

4.4.4 Surface Water Quality Comparison Downstream of Leachate Seep Control System – Eastern Watercourse

Station S1 is located downstream of station S5 and near the downslope end of the Leachate Seep Control System, which was constructed in 2010/2011 to control the leachate seep near the toe of the waste. Parameter concentrations were typically greater at S1 compared to S5, which indicates a localized landfill leachate effect on surface water quality immediately adjacent to the Leachate Seep Control System as a result of runoff and/or groundwater discharge.

A comparison of surface water quality downstream of the Leachate Seep Control System (station S1) is provided in Figures F-8 through F-11, Appendix F. It is noted that station S1 only contained sufficient water for low flow in May 2024. In general the surface water quality at downstream stations is similar, with the following patterns.

- Chloride: The background chloride concentration at station S5 was greater in 2024 compared to the other stations that were sampled. The chloride concentrations in surface water at the downstream stations and within the Magnetawan River were similar with a difference of less than 2 mg/L.
- Boron: Boron concentrations were similar for S2 and S4. The overall difference in concentrations at the monitoring stations was less than 0.06 mg/L.
- Iron: In 2024 the iron concentrations within the eastern surface watercourse showed a slight decrease in a downstream direction, with some variability. Iron concentrations at background station S7 were similar to downstream stations S2 and S4 in May and greater than downstream station S4 in September. Thus, a landfill leachate influence on the iron concentrations is not apparent at downstream stations.
- Total Phosphorus: The total phosphorus concentrations were at the detection limit, except near the toe of the waste at station S1. There is no consistent pattern to suggest a landfill leachate effect at the downstream surface water stations.

4.4.4.1 TRILINEAR DIAGRAM

Figure 4 presents the leachate, groundwater, and surface water quality for May at the monitoring stations on a Trilinear diagram. As shown in the diagram, surface water quality within the eastern surface watercourse at stations S2, S4, S5, and S7 show a similar grouping. Station S1 shows a different major ion composition to this grouping, which suggests a landfill leachate effect.

Within the Magnetawan River grouping stations SW1 and SW2 show similar major ion proportions.

Surface water quality at stations S6 and S9 also plot in a similar grouping for the western surface watercourse.

4.4.5 Surface Water Quality Comparison Downstream of Leachate Seep Control System – Western Watercourse

Historically, for surface water quality within the western watercourse, the surface water quality at station S6, located downstream of the Leachate Seep Control System, was compared to the quality of water flowing from the dug well. The MECP requested that the dug well be removed from the monitoring program in 2014. Considering the time-concentration graphs, elevated concentrations of chloride and boron continue to fluctuate with time, with a pattern of decreasing chloride concentrations over time since 2015. In May 2024 there was an evident decrease in parameter concentrations within surface water from station S6 in a downstream direction to station S9 near the Magnetawan River, except for iron, COD, and total suspended solids (TSS). The increase in iron and TSS are attributed to erosion within the watercourse during surface water flow toward the Magnetawan River.

4.4.6 Magnetawan River Water Quality

Upstream surface water sampling station SW2 was used to assess natural water quality changes with time within the Magnetawan River. Considering historic water quality results (2003 to 2023), concentrations of major ions and heavy metals in 2024 were similar to historic water quality.

Constituent concentrations within the surface water downstream of the landfill site at station SW1 were similar compared to upstream surface water quality (SW2) and were generally similar to historic results (2003 to 2023). As shown in the Trilinear diagram of Figure 4, both SW1 and SW2 show similar proportions of major ions.

4.4.7 Comparison to Provincial Water Quality Objectives

A summary of monitoring stations during periods of surface water flow that had parameter concentrations that exceeded the Provincial Water Quality Objectives (1994 and updates) (PWQOs) at least once in 2024 is provided below.

PARAMETER	MONITORING STATIONS WITH PWQO EXCEEDANCE
pH	SW1
Iron	S1, S2, S4, S5, S6, S7, S9, SW1, SW2
Boron	S1, S6
Total Phosphorus	S1

As noted above, the elevated iron concentrations are attributed to natural erosion within the watercourses. The elevated boron and total phosphorus concentrations adjacent to the landfill at stations S1 (both parameters) and S6 (boron) may be an effect of landfill leachate.

4.4.8 Comparison to Trigger Criteria

As part of the water quality assessment in accordance with the Revised Contingency Plan (Genivar, 2012) prepared for the landfill site, the surface water quality at the Compliance Point was compared to the following Trigger Criteria. For comparison, the background surface water concentrations at station SW2 exceeded the Trigger Criterion for iron in 2024.

PARAMETER	TRIGGER CRITERIA	BACKGROUND SURFACE WATER			COMPLIANCE POINTS	
		SW2	S5	S7	S4	S9
Chloride	120	4.34 – 9.40	11.2	3.11 – 6.02	4.28 – 11.3	25.5
Ammonia (unionized)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron	0.3	0.212 – 0.624	0.507	0.491 – 0.688	0.372 – 0.557	0.708
Boron	0.2	<0.010 – 0.012	0.02	<0.010 – 0.013	0.042 – 0.065	0.135
Copper	0.005	<0.002	<0.002	<0.002	<0.002	<0.002
T. Phosphorus	0.03	<0.02	<0.02	<0.02	<0.02	0.02
Zinc	0.02	<0.020	<0.020	<0.020	<0.020	<0.020

NOTES:

1. All concentrations are in mg/L.
2. Shading indicates concentration exceeds Trigger Criterion.
3. Trigger Criteria from Waste ECA.

Trigger criteria were satisfied at the Compliance Points, except for iron at stations S4 and S9. This parameter can be influenced by erosion, such as created from the changing geomorphology of the watercourse. In addition, background concentrations of iron were also elevated and in some cases greater than observed in surface water at station S4. Considering the low concentrations of more soluble parameters that are good indicators of landfill leachate effects (e.g. chloride, boron, and nutrients such as nitrogen in ammonia, nitrates, and nitrites), the elevated concentrations are not attributable to landfill leachate effects. No further remedial actions or supplemental sampling are required at this time.

4.4.9 Summary

The Leachate Seep Control System has had a beneficial effect on surface water quality on the landfill site. Decreasing parameter concentrations within surface water near the waste footprint

are apparent and visible discolouration of soil around the waste footprint has decreased. While some landfill leachate effects occur immediately adjacent to the Leachate Seep Control System at stations S1 and S6 as a result of runoff and/or groundwater discharge, low concentrations of the more soluble parameters within the surface water of the onsite watercourses downstream of the waste footprint and operation areas that are good indicators of landfill leachate effects (e.g. chloride, boron, nutrients such as nitrogen in ammonia, nitrates, and nitrites) indicate that the elevated concentrations detected for some parameters within the surface water at downstream stations near the Magnetawan River are not attributable to landfill leachate effects, but are likely a result of erosion, such as created from the changing geomorphology of the watercourse, background groundwater quality influences, and background surface water quality influences. No further remedial actions or supplemental sampling are required at this time.

Based on the surface water sampling within the Magnetawan River upstream (SW2) and downstream (SW1) of the landfill site, no detectable landfill leachate effects were evident within the surface water.

5. LEACHATE CONTINGENCY PLAN

In 2010/2011 the TRI-R Committee constructed the Leachate Seep Control System in accordance with the Sewage CofA. The sand mantles were completed and vegetation established on and adjacent to the mantles. Full maturation of the Leachate Seep Control System occurred in 2012 for substantial completion of the system. In July 2012 a Substantial Completion Report was prepared in accordance with the Sewage CofA (Genivar, 2012).

The Leachate Seep Control System was effective in removing the historic groundwater seeps near the perimeter of the waste footprint and the operation areas. Some runoff and/or intermittent groundwater seepage occurred at the downgradient edge of the sand mantles amongst the Higher Aquatic Plants in 2024. Some visible iron staining was present in the area of the intermittent groundwater seepage and for a short distance within the adjacent onsite watercourses. However, the quality of the surface water immediately adjacent to the seeps continued to improve with the operation of the Leachate Seep Control System.

Some downstream surface water quality effects from erosion related to the changing geomorphology of the watercourse, groundwater discharge, and contribution from background surface water were apparent farther downstream within the eastern watercourse. No adverse effects to surface water quality were detected at the downgradient boundary of the attenuation zone or within the Magnetawan River as a result of landfill leachate.

6. LANDFILL OPERATIONS AND PERFORMANCE

In accordance with Conditions 54b, 54c, and 54h of the Waste ECA, the following subsections provide an update of site operations and performance.

6.1 ASSESSMENT OF OPERATIONS AND PERFORMANCE OF ENGINEERED FACILITIES

As detailed in Section 5, the landfill site is not having a negative effect on groundwater quality at the downgradient attenuation zone boundary with the Magnetawan River. Operation and maintenance of the Leachate Seep Control System was continued through 2024. In 2025 additional planting should be completed in areas of poor vegetation growth or erosion on and around the sand mantles.

Figure 2 presents the approved waste footprint. The active face is located in the west-central portion of the footprint. In 2024 the placement of daily and interim cover within the working areas was continued. The waste compactor was operational in 2024.

A drone survey was completed on August 29, 2024, which indicated the placement of 862.4 m³ of waste since the previous survey of August 30, 2023 (12 month period). A total of 13,061.9 m³ of waste capacity (excluding final cover) remains. Based on a waste capacity utilization rate of about 1,500 m³, it is estimated that the available waste capacity will allow for approximately nine (9) more years of waste disposal, until early 2033. It is noted that this approximation may vary with increases or decreases in waste disposal volume.

The onsite facilities that include a Maintenance and Recycling Building were operational in 2024. In addition, the stationary recycling compactor located near the north side of the residential sorting area (Quonset Hut) was operational in 2024 to reduce material transport costs and the landfill carbon footprint. It is understood that no changes to the buildings are proposed for 2025.

6.2 OPERATIONAL PROBLEMS AND CORRECTIVE ACTIONS

No operational problems or corrective actions were identified or required in 2024.

In 2025 it is recommended that ongoing maintenance of the Leachate Seep Control System be continued with the infilling of erosional gullies and the planting of Higher Aquatic Plants (HAP) in areas of sparse plantings and along the edges of the sand mantles where some periodic water discolouration was observed in 2024.

7. WASTE TOTALS

In accordance with Conditions 54d, 54e, 54f, 54k, and 54l of the Waste ECA the following estimates are provided.

PARAMETER	APPROXIMATE (Based on Historic Surveys and Capacity Utilization)	SURVEYED
Estimated Waste, Daily and Intermediate Cover for 2023 and 2024 (12 month period)	862.4 m ³	Completed in August 2024.
Estimated Volume of Site Capacity Used in 2023 and 2024 (12 month period)	862.4 m ³	Completed in August 2024.
Estimated Remaining Site Waste Capacity	13,062 m ³	Completed in August 2024.
Estimated Remaining Site Life	9 years (early 2033)	
Total Annual Quantity of Waste Received in 2023 and 2024 (12 month period)	Based on a capacity utilization of 862.4 m ³ , daily and intermediate cover of 20%, and compaction, it is estimated that approximately 1,100 m ³ of waste was received at the site in 2023 and 2024 (12 month period).	

No contaminated soil was received at the landfill site in 2024.

8. COMPLAINTS

No formal (written) complaints were received by the Township of Armour in 2023.

9. 2025 MONITORING PROGRAM

Based on the monitoring program findings, the Waste ECA, and the Sewage CofA, Table 3 provides the 2025 monitoring program. It is recommended that the surface water monitoring component of the monitoring program be modified to focus on two water quality sampling events in May (continues the historic May sampling) and September (combines the historic August and November sampling), with the removal of the June, July, and October flow rate monitoring events (historically no sampling completed at this time). This modification will bring the surface water monitoring frequency in line with the current groundwater monitoring frequency.

Trigger mechanisms, data assessment processes, and contingency measure concepts are detailed in the Revised Contingency Plan (Genivar, 2012) and the Waste ECA. Trigger concentrations to be applied at the Compliance Points for groundwater (BH03-1, BH03-2, BH07-1, BH07-2) and surface water (S4, S9) are provided below.

PARAMETER	TRIGGER CRITERIA
Chloride	120
Ammonia (unionized)	0.02
Iron	0.3
Boron	0.2
Copper	0.005
Total Phosphorus	0.03
Zinc	0.02

NOTES:

1. All concentrations are in mg/L.
2. Trigger Criteria represent the PWQO/CCME values or 75% of the background surface water concentrations at stations S5 and S7, whichever is greater (ResEnv, 2014).

As the trigger concentrations are typically less than the maximum background concentration in groundwater and surface water, some natural exceedances of the trigger concentrations are anticipated. Thus, an exceedance of a trigger concentration is not a compliance issue, but allows for a conservative assessment of groundwater and surface water and implementation of a contingency measure, if required, prior to a compliance issue.

i) Groundwater Assessment Process

One-Week Assessment

Water sample results that are obtained as part of the routine sampling events will be compared to the established trigger concentrations within one week of receipt from the laboratory. If a parameter exceeds its trigger concentration an evaluation of the potential source of the trigger concentration exceedance will be completed. If the exceedance is attributable to natural water quality variability the trigger concentration will be modified and the routine monitoring will be continued. If the exceedance is attributed to a landfill source, a verification sampling event will be completed for the respective compliance point.

Two-Month Assessment

The verification sampling event will be completed within two months of the routine sampling event. This timeline provides sufficient time for laboratory analyses, data review and evaluation, notification of the TRI-R Committee, and co-ordination of the resampling event. If sampling is being completed for a surface water station and the station is dry, the verification sampling event will be completed when surface water flow is observed. If an exceedance is attributable to natural water quality variability the trigger concentration will be modified and the routine monitoring will be continued. If an exceedance is attributed to a landfill source, a contingency system(s) will be implemented.

Four-Month Assessment

Contingency system(s) implementation will commence with the evaluation, design, and submission of a contingency system(s) to the MECP for approval within four months of the initial sampling event. Upon receipt of MECP approval, the contingency system(s) will be implemented and monthly monitoring of the trigger parameters will be initiated. Upon completion of three consecutive sampling events with acceptable water quality that is not negatively impacted by landfill leachate, the routine monitoring program will be continued.

ii) Surface Water Assessment Process

In the event that a surface water monitoring result at station S4 or S9 exceeds a Trigger Criterion or background concentration (if greater in value), a supplemental sampling event will be completed within a one (1) month period to confirm the exceedance at either location.

In the event that the exceedance is not confirmed the normal monitoring program shall be continued. In the event that the exceedance is confirmed the applicable contingency measure(s) will be implemented, as approved by the MECP Director. Subsequent surface water monitoring will be continued at a monthly frequency. Normal monitoring may be reinitiated if monitoring results satisfy all Trigger Criteria or background concentrations (if greater in value) for three (3) consecutive sampling events.

iii) Contingency Measures

If trigger concentration exceedances occur as a result of landfill leachate, contingency measures will be implemented that could include the following.

- Mitigation of leachate seeps through sideslopes by the construction of hydraulic connections in the waste. The hydraulic connections would be constructed by the excavation of the landfill cover and waste, placement of drainage material such as 19 mm granular, and replacement of the final cover. Waste would be landfilled in the active fill area or transported off-site for disposal.
- Enhancements to the Leachate Seep Control System through construction of additional mantle/constructed wetlands in the areas of any new seeps and/or enlargement of the mantles/constructed wetlands.
- Collection of landfill leachate with sumps and treatment at onsite or offsite facilities. Sumps would be constructed within the waste or at the waste toe, and pumped as required for suitable disposal. Short-term storage of the pumped leachate within the landfill waste could be considered during mobilization of leachate haulage equipment and disposal arrangements.

Monitoring program findings should be compared to historic results, trigger concentrations, and regulatory standards, objectives, or guidelines, and documented in an annual report by April 30, 2026. Reporting should be completed in accordance with Conditions 53 and 54 of the Waste ECA and Condition 7 of the Sewage ECA.

10. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings presented in this report, we are pleased to provide the following conclusions.

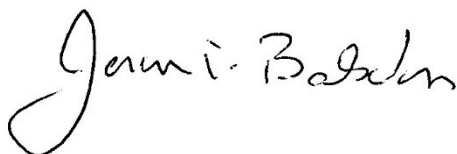
- Groundwater and surface water continue to move in a downslope direction toward the Magnetawan River to the south. Leachate management is achieved through the operation and maintenance of a Leachate Seep Control System and a landfill attenuation zone located between the waste footprint and the Magnetawan River.
- Landfill leachate quality in 2024 was within the range of historic leachate, except for elevated concentrations of conductivity, alkalinity, chloride, and ammonia, and low concentrations for total dissolved solids (TDS). A general increasing concentration trend with time was apparent for chloride, boron, and ammonia.
- The existing landfill site is not causing an unacceptable impact on the local shallow and deep groundwater resources at the downgradient attenuation zone boundary with the Magnetawan River. Thus, the landfill attenuation zone is effective in protecting groundwater resources.
- Historic leachate seeps were removed with the construction of the Leachate Seep Control System. Water that currently accumulates near the toe of the Leachate Seep Control System originates from runoff as well as intermittent groundwater seepage. The improvement in surface water quality adjacent to the Leachate Seep Control System observed in 2011 through 2023 was also observed in 2024. Some water quality effects from the landfill are apparent within the intermittent watercourses immediately adjacent to the Leachate Seep Control System, but parameter concentrations decrease within the landfill attenuation zone. Surface water quality downstream of the waste footprint and operation areas is affected by erosion during watercourse geomorphological changes, but unacceptable landfill leachate effects were not detected in surface water at the downstream boundary of the landfill attenuation zone. The surface water quality within the Magnetawan River also does not show landfill leachate effects.

The following recommendations are provided for consideration in 2025.

- The Leachate Seep Control System should continue to be operated and maintained in accordance with the Operations and Maintenance Manual. Maintenance should include the infilling of erosional gullies and the planting of Higher Aquatic Plants in areas of sparse plantings and along the edges of the sand mantles where some water discolouration was observed in 2024.
- Groundwater and surface water monitoring and reporting should continue in 2025 as outlined in Section 9 of this report. It is recommended that the surface water monitoring component of the monitoring program be modified to focus on two water quality sampling events in May (continues the historic May sampling) and September (combines the historic August and November sampling), with the removal of the June, July, and October flow rate monitoring events (historically no sampling completed at this time). This modification will bring the surface water monitoring frequency in line with the current groundwater monitoring frequency.

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Tables

TABLE 1
2024 MONITORING PROGRAM
TRI-R LANDFILL SITE

MONITORING LOCATIONS	PARAMETERS	FREQUENCY
LEACHATE		
BH07-5, BH15-1	Leachate Levels	May and September
BH15-1	FP	September
	GW-CL, TSS	
GROUNDWATER		
BH2, BH3, BH03-1, BH03-2, BH03-3, BH07-1, BH07-2, BH07-3, BH07-4, BH10-1, BH10-2, BH15-2, BH15-3	Groundwater Levels	May and September
BH2, BH3, BH03-1, BH03-2, BH03-3, BH07-1, BH07-2, BH07-3, BH10-1, BH10-2, BH15-2, BH15-3	FP	May
	GW-IL	
BH03-1, BH03-2, BH07-1, BH07-2	FP	September
	GW-CL	
SURFACE WATER		
S1, S2, S4, S5, S6, S7, S8, S9	Flow Rates	May, June, July, August, September, October, November
S1, S2, S4, S5, S6, S7, S8, S9, SW1, SW2	FP	May, August, November
	SW-CL	

NOTES:

1) FP indicates field parameters: pH, conductivity, turbidity, dissolved oxygen, temperature.

2) GW-CL indicates: alkalinity, bicarbonate alkalinity, carbonate alkalinity, ammonia (total), arsenic, barium, boron, cadmium, calcium, chloride, chromium, conductivity, copper, iron, lead, magnesium, manganese, mercury, nitrate, nitrite, TKN, pH, total phosphorus, potassium, sodium, TDS, sulphate, zinc, COD, DOC, phenol.

3) GW-IL indicates: alkalinity, bicarbonate alkalinity, carbonate alkalinity, ammonia (total), barium, boron, calcium, chloride, conductivity, iron, magnesium, nitrate, pH, potassium, sodium, TDS, sulphate, zinc.

4) SW-CL indicates: alkalinity, bicarbonate alkalinity, carbonate alkalinity, ammonia (total), arsenic, barium, boron, cadmium, calcium, chloride, chromium, conductivity, copper, iron, lead, magnesium, mercury, nitrate, nitrite, TKN, pH, potassium, total phosphorus, TSS, TDS, sodium, sulphate, zinc, BOD₅, COD, DOC, phenol.

TABLE 2
LEACHATE INDICATOR CONCENTRATION SUMMARY
TRI-R LANDFILL SITE

PARAMETER	UNITS	HISTORIC LEACHATE CONCENTRATION RANGES	BH15-1 LEACHATE CONCENTRATIONS (2015 - 2024)	BACKGROUND GROUNDWATER CONCENTRATIONS	BACKGROUND SURFACE WATER CONCENTRATIONS
Conductivity	uS/cm	253 - 4170	935 - 2170	100 - 1400	40 - 130
Hardness	mg/L	13 - 1300	-	30 - 54	12 - 41
Alkalinity	mg/L	30 - 1710	324 - 931	<5 - 83	5 - 28
Chloride	mg/L	6 - 300	32.6 - 80.0	2 - 535	3 - 10
Sulphate	mg/L	<1 - 1300	1.34 - 126	3 - 48	<0.5 - 15
Calcium	mg/L	19 - 470	10.2 - 151	7 - 89	4 - 11
Magnesium	mg/L	3 - 88	1.64 - 84.7	2 - 70	1 - 4
Potassium	mg/L	1 - 150	2.05 - 85.6	2 - 3	1 - 2
Sodium	mg/L	12 - 320	21.8 - 224	3 - 65	2 - 8
Boron	mg/L	0.03 - 4.3	0.187 - 1.53	<0.01 - 0.037	<0.01 - 0.04
Iron	mg/L	<0.1 - 1300	0.511 - 402	<0.01 - 88	0.15 - 1
Manganese	mg/L	0.18 - 13	0.121 - 6.31	<0.05 - 3.05	0.013 - 0.067
Ammonia (total)	mg/L	<0.02 - 150	0.18 - 91.4	<0.05 - 1.29	<0.02 - 0.1
Nitrate	mg/L	<0.1 - 12	<0.25 - 1.66	<0.05 - 1.25	<0.1 - 0.3
DOC	mg/L	3.5 - 123	24 - 72.5	0.4 - 11.7	4.8 - 6.5
Chromium	mg/L	<0.003 - 0.032	<0.003 - 0.421	<0.0005	<0.003 - <0.005
Cadmium	mg/L	<0.0001 - 0.002	<0.001 - 0.0011	<0.0001 - 0.0001	<0.0001
Phenols	mg/L	<0.001 - 0.022	<0.001 - 0.06	<0.001	<0.001 - 0.001
Copper	mg/L	<0.003 - 0.086	<0.003 - 0.261	<0.001 - 0.009	<0.0001 - 0.003
Lead	mg/L	<0.0005 - 0.093	<0.002 - 0.109	<0.0005	<0.0005 - 0.001
Phosphorus (total)	mg/L	0.02 - 4.5	0.26 - 16.5	<0.1 - 1.6	0.011 - 0.06
Zinc	mg/L	0.001 - 0.59	<0.005 - 1.04	<0.005 - 0.062	<0.005 - 0.023
Arsenic	mg/L	<0.001 - 0.005	<0.003 - 0.048	<0.001	<0.001
Benzene	µg/L	<0.1 - 1.9	-	<0.1 - 0.2	<0.1
1,4-Dichlorobenzene	µg/L	<0.2 - 1	-	<0.2	<0.2

NOTES:

- 1) 'uS/cm' denotes microsiemens per centimetre.
- 2) 'mg/L' denotes milligrams per litre.
- 3) Historic leachate quality based on historic results for SW-SEEP, SW-SEEP-2, and BH07-5.
- 4) Groundwater quality is based on historic (pre-2016) results for background stations at Chetwynd Road, dug well, BH07-3, BH07-4, and BH10-2.
- 5) Surface water based on historic (pre-2016) results for background station SW2.
- 6) '-' indicates not determined.

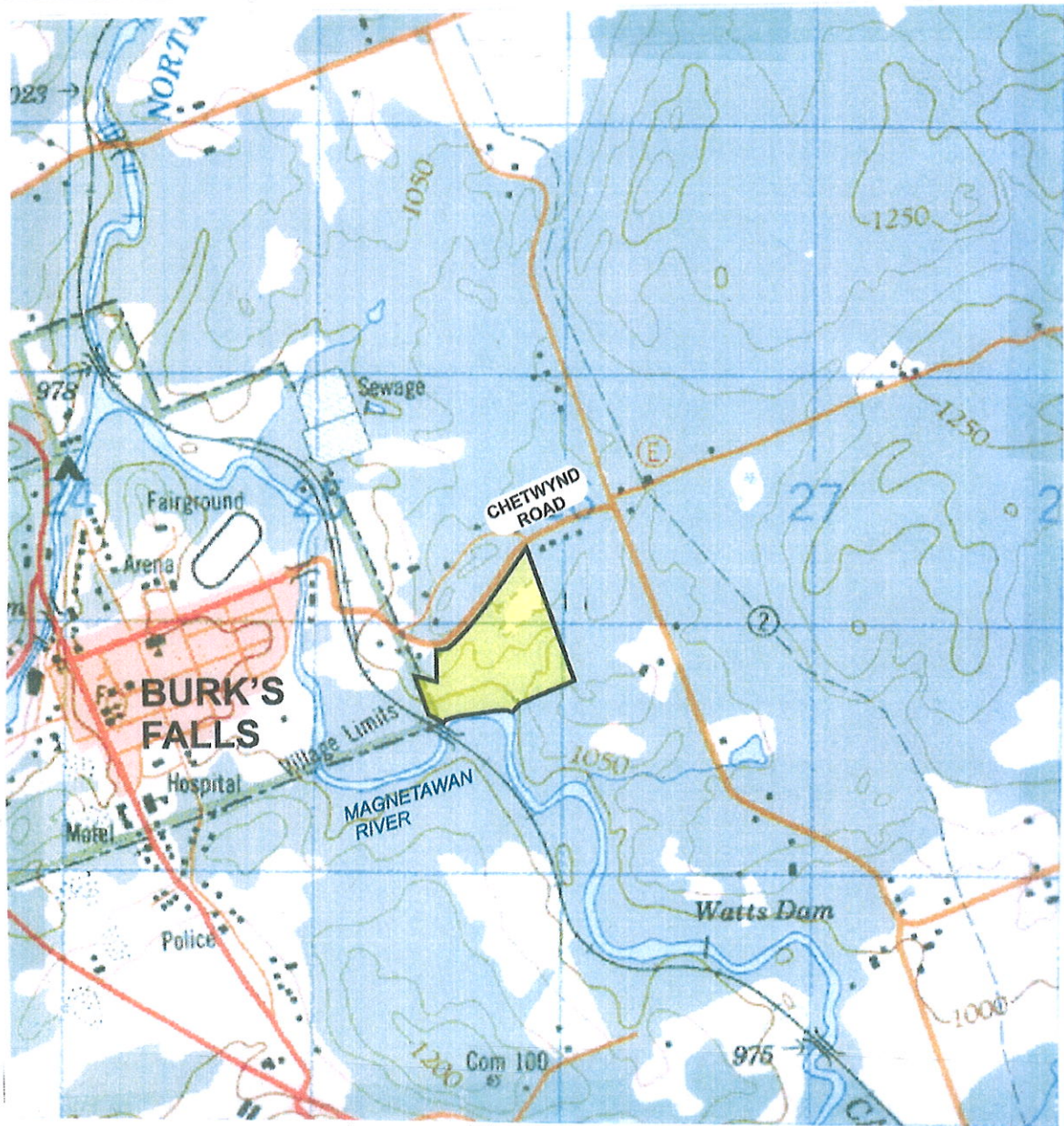
TABLE 3
PROPOSED 2025 MONITORING PROGRAM
TRI-R LANDFILL SITE

MONITORING LOCATIONS	PARAMETERS	FREQUENCY
LEACHATE		
BH07-5, BH15-1	Leachate Levels	May and September
BH15-1	FP	September
	GW-CL, TSS	
GROUNDWATER		
BH2, BH3, BH03-1, BH03-2, BH03-3, BH07-1, BH07-2, BH07-3, BH07-4, BH10-1, BH10-2, BH15-2, BH15-3	Groundwater Levels	May and September
BH2, BH3, BH03-1, BH03-2, BH03-3, BH07-1, BH07-2, BH07-3, BH10-1, BH10-2, BH15-2, BH15-3	FP	May
	GW-IL	
BH03-1, BH03-2, BH07-1, BH07-2	FP	September
	GW-CL	
SURFACE WATER		
S1, S2, S4, S5, S6, S7, S8, S9	Flow Rates	May, September
S1, S2, S4, S5, S6, S7, S8, S9, SW1, SW2	FP	May, September
	SW-CL	

NOTES:

- 1) FP indicates field parameters: pH, conductivity, turbidity, dissolved oxygen, temperature.
- 2) GW-CL indicates: alkalinity, bicarbonate alkalinity, carbonate alkalinity, ammonia (total), arsenic, barium, boron, cadmium, calcium, chloride, chromium, conductivity, copper, iron, lead, magnesium, manganese, mercury, nitrate, nitrite, TKN, pH, total phosphorus, potassium, sodium, TDS, sulphate, zinc, COD, DOC, phenol.
- 3) GW-IL indicates: alkalinity, bicarbonate alkalinity, carbonate alkalinity, ammonia (total), barium, boron, calcium, chloride, conductivity, iron, magnesium, nitrate, pH, potassium, sodium, TDS, sulphate, zinc.
- 4) SW-CL indicates: alkalinity, bicarbonate alkalinity, carbonate alkalinity, ammonia (total), arsenic, barium, boron, cadmium, calcium, chloride, chromium, conductivity, copper, iron, lead, magnesium, mercury, nitrate, nitrite, TKN, pH, potassium, total phosphorus, TSS, TDS, sodium, sulphate, zinc, BOD₅, COD, DOC, phenol.

Figures



LEGEND



APPROXIMATE SITE LOCATION



MAP SOURCE: NTS 1:50000, SHEET E31/11, BURK'S FALLS

SITE LOCATION

ANNUAL MONITORING REPORT
TRI-R COMMITTEE LANDFILL SITE
For TOWNSHIP OF ARMOUR

DATE: JANUARY 2020

SCALE: 1:25,000

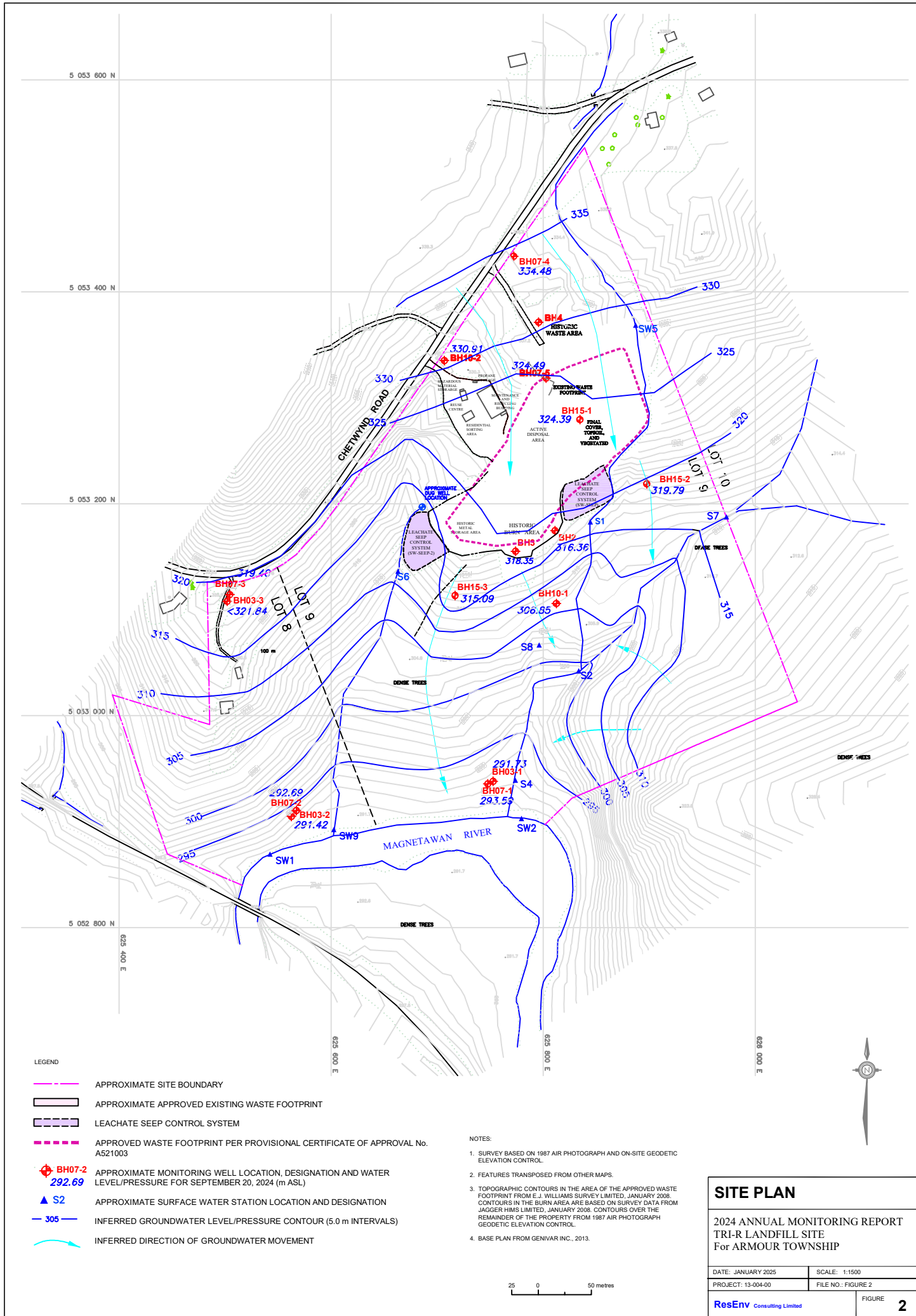
PROJECT: 13-004-00

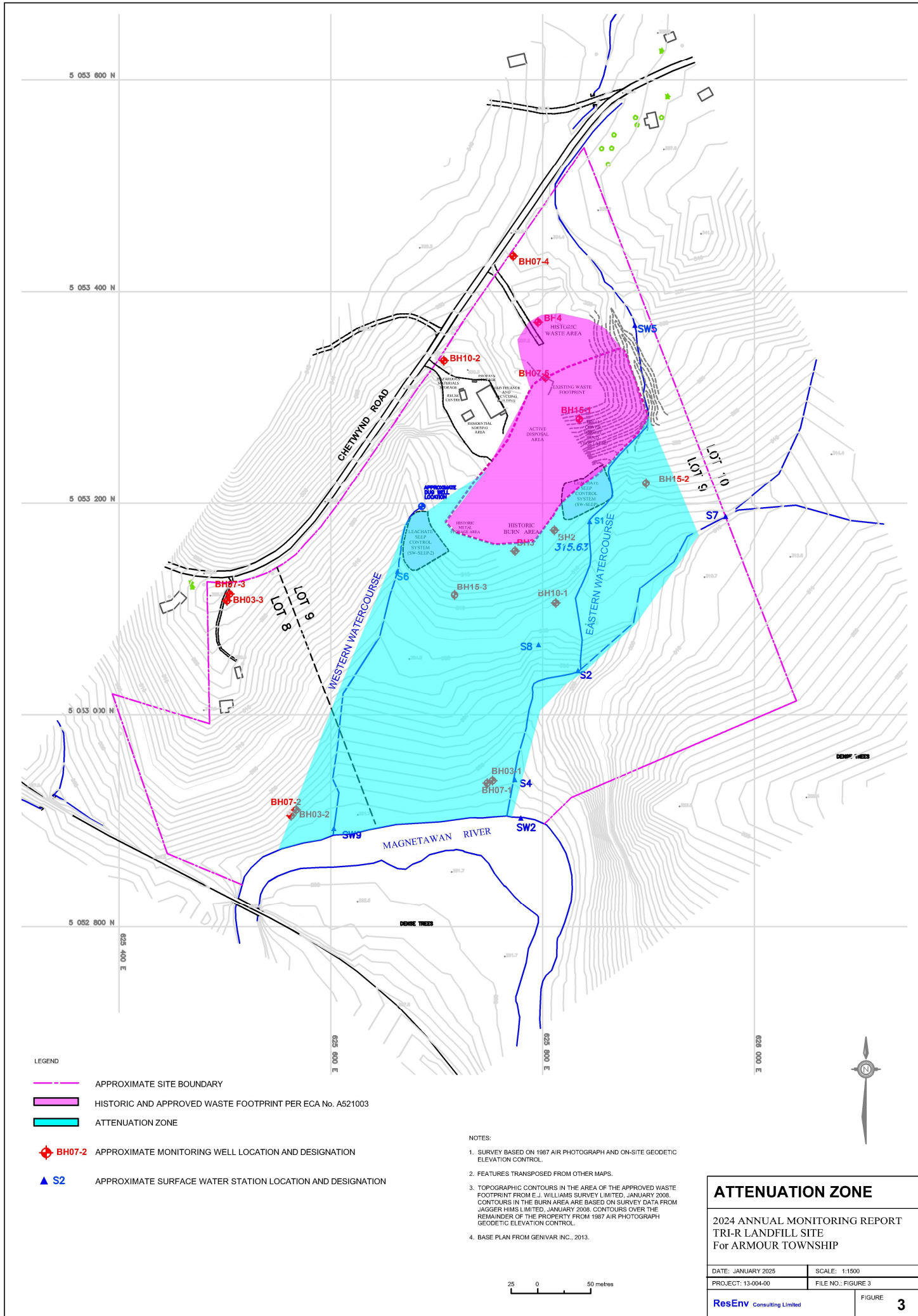
FILE NO.: Figure 1

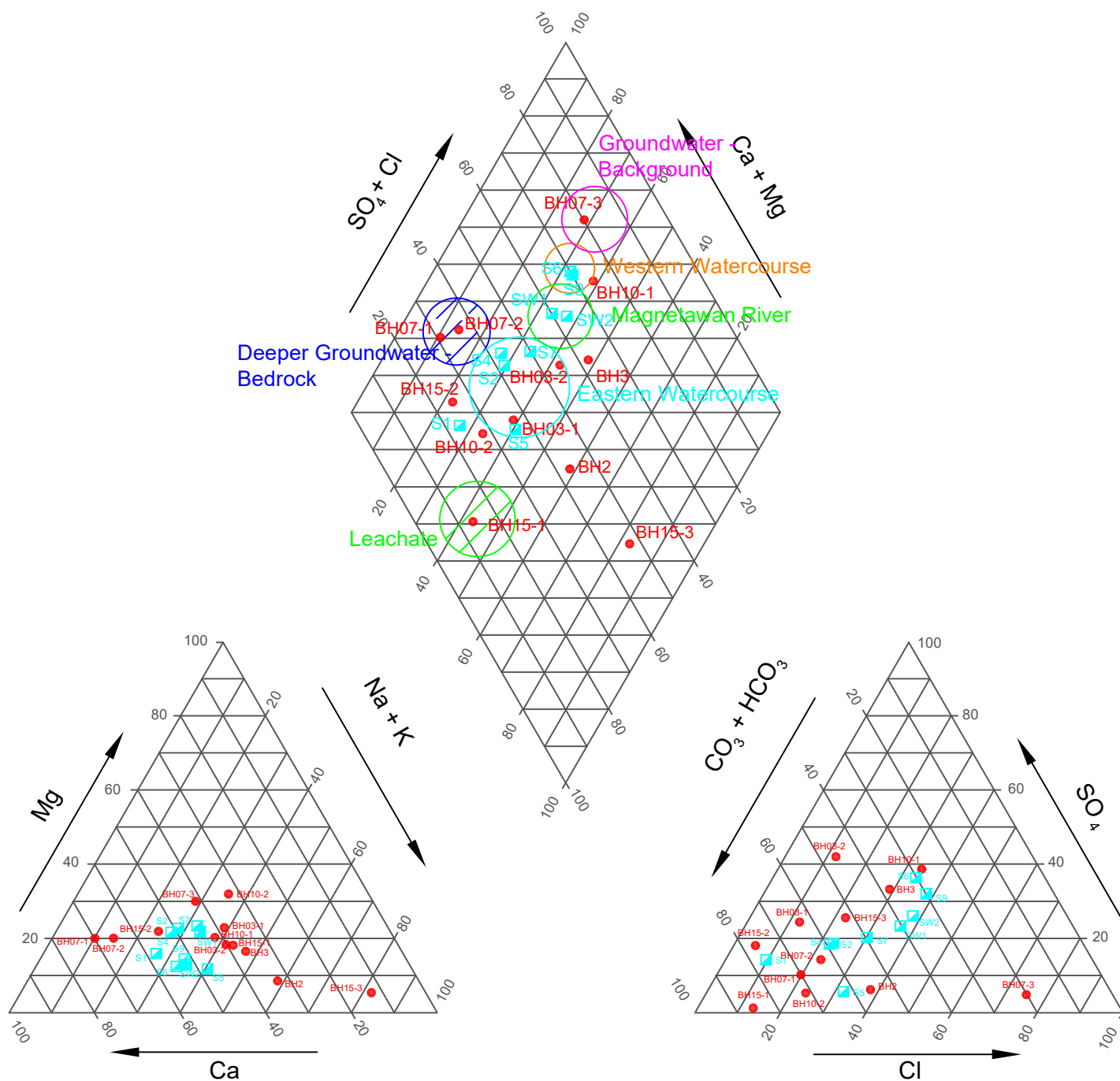
ResEnv Consulting Limited

FIGURE

1







LEGEND

- MONITORING WELL - May/September 2024
- SURFACE WATER STATION - May 2024

TRILINEAR DIAGRAM - GROUNDWATER QUALITY

2024 ANNUAL MONITORING REPORT
TRI-R COMMITTEE LANDFILL SITE
for TOWNSHIP OF ARMOUR

DATE: JANUARY 2025

SCALE: AS SHOWN

PROJECT: 13-004-00

REF. NO.: Fig 4

ResEnv Consulting Limited

FIGURE

4

FIGURE 5
MOVING ANNUAL AVERAGE - Chloride

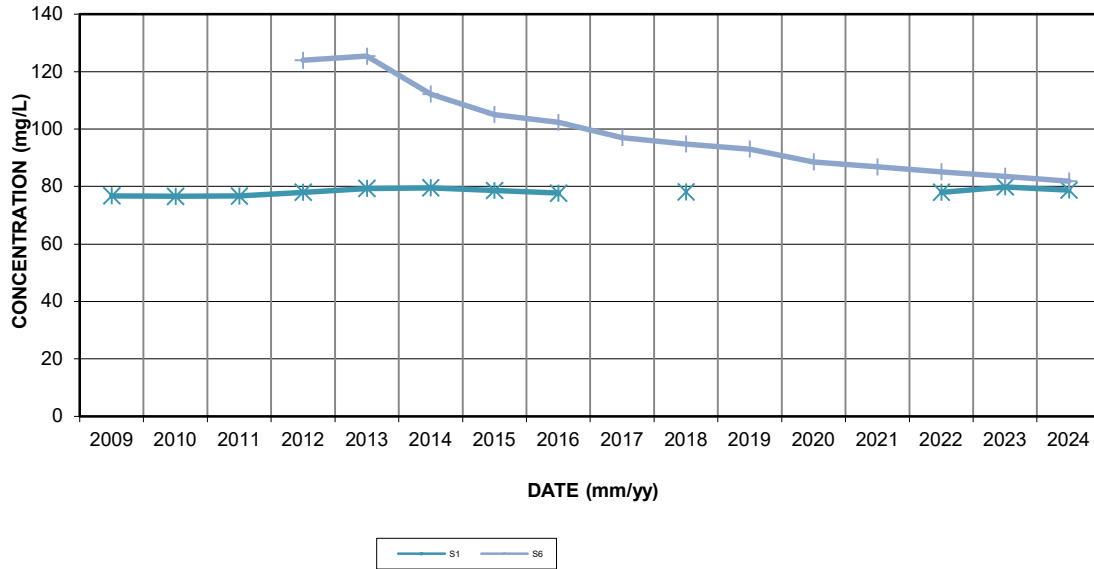


FIGURE 6
MOVING ANNUAL AVERAGE - Boron

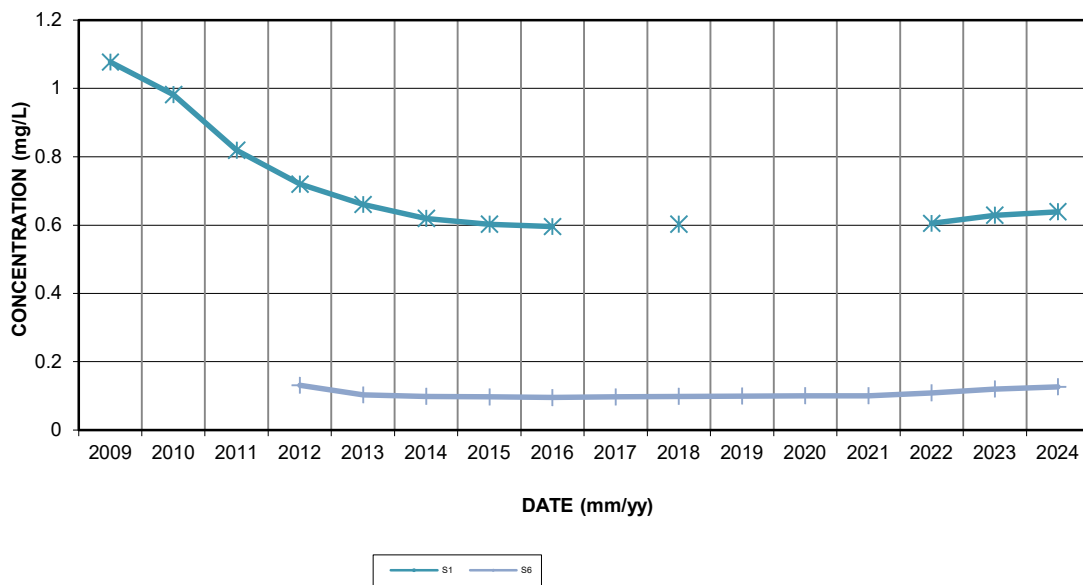


FIGURE 7
MOVING ANNUAL AVERAGE - Iron

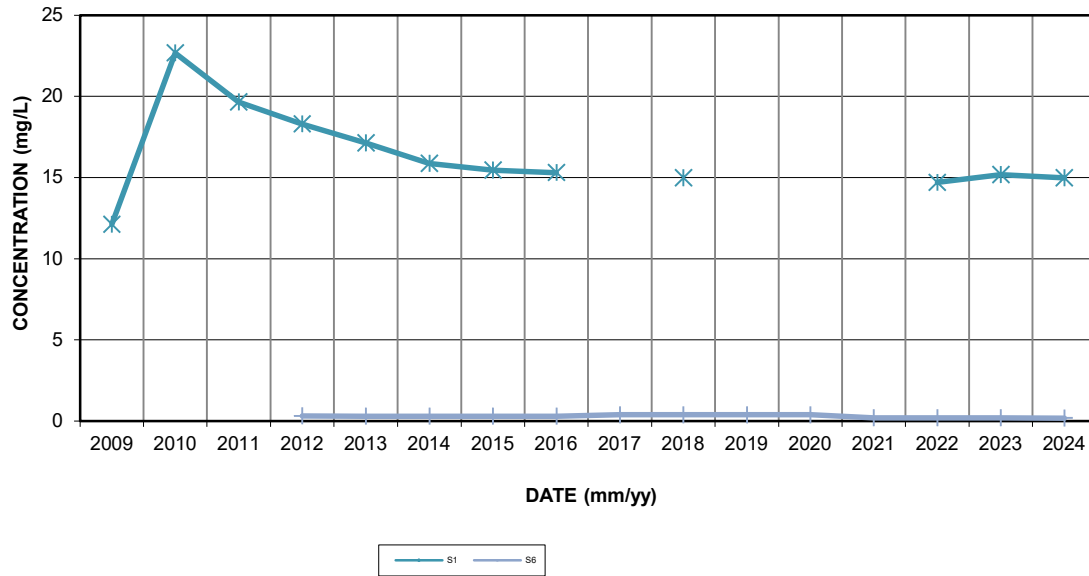


FIGURE 8
MOVING ANNUAL AVERAGE - Total Phosphorus

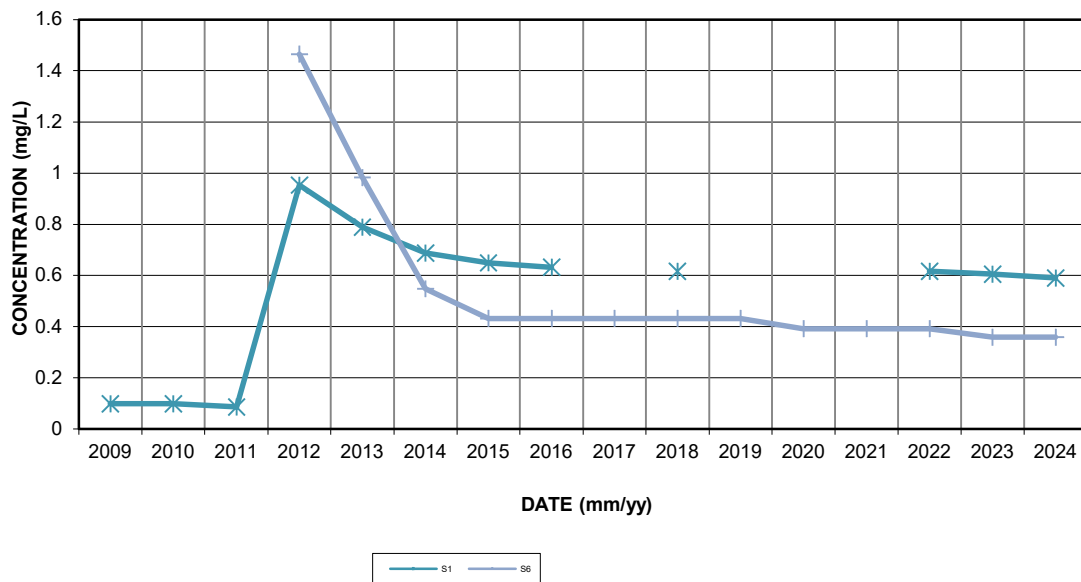


FIGURE 9
MOVING ANNUAL AVERAGE - Total Ammonia

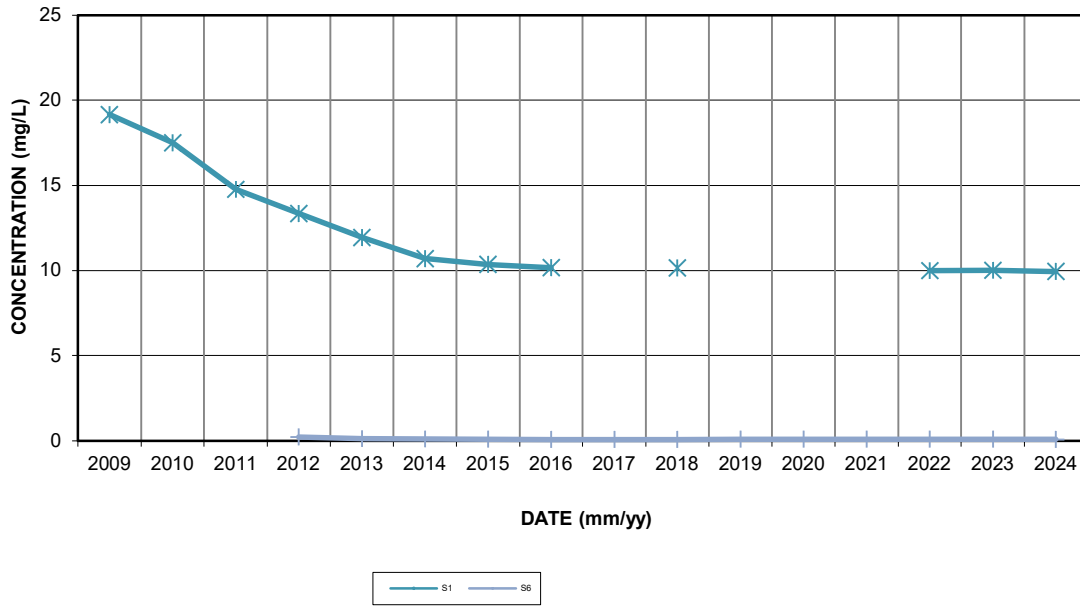


FIGURE 10
MOVING ANNUAL AVERAGE - TKN

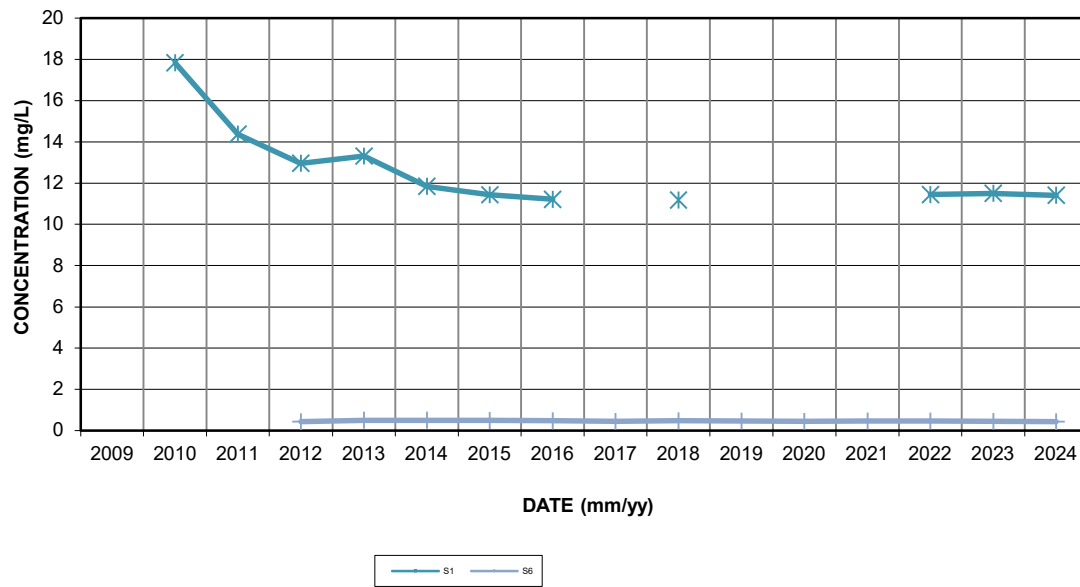
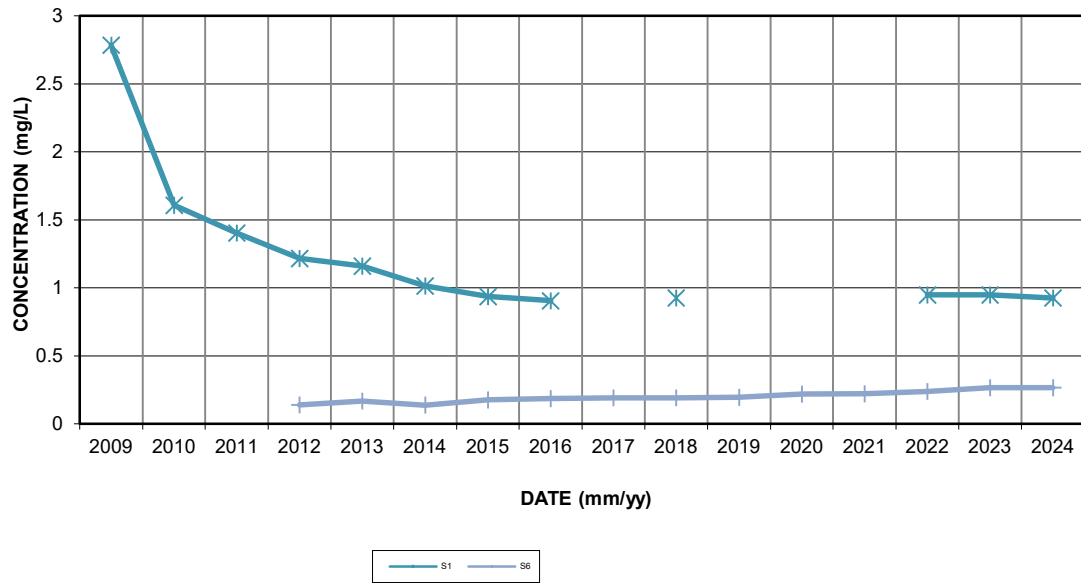


FIGURE 11
MOVING ANNUAL AVERAGE - Nitrate



Appendices

Appendix A

Approval Documents

- Amendment to Environmental Compliance Approval Number A521003, Notice 2, Dated April 9, 2014
 - Amendment to Environmental Compliance Approval Number A521003, Notice 1, Dated November 15, 2011
 - Amended Provisional Certificate of Approval Waste Disposal Site No. A521003, Dated June 8, 2011
 - Certificate of Approval Municipal and Private Sewage Works Number 6402-854LHL, Dated August 20, 2010
-

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A521003

Notice No. 3

Issue Date: March 28, 2017

The Corporation of the Village of Burk's Falls
56 Ontario St
Post Office Box, No. 533
Burk's Falls, Ontario, P0A 1C0

Site Location: TRI Communal Landfill Armour
141 Chetwynd Rd Township of Armour
Township of Armour, District of Parry Sound, P0A 1C0

You are hereby notified that I have amended Approval No. A521003 issued on June 8, 2011 and amended on April 9, 2014 for use and operation of a 1.73 hectare landfilling area within a total site area of 20.2 hectare having a total capacity of 86,500 cubic metres excluding final cover , as follows:

I. Conditions 22.a and 22.b are hereby revoked and replaced as follows:

22. a. The total approved capacity for the Site is 86,500 cubic meters inclusive of waste, daily and intermediate cover.
- b. No waste shall be landfilled outside of the limit of fill area as shown in Figure 3, item 15, Schedule A.
- c. The Owner shall conduct a survey, on a frequency recommended by the District Manager, to ensure that the approved capacity is not exceeded and that the waste is disposed within the approved fill area.

II. Condition 55.iv) is hereby revoked and replaced as follows:

55. iv) a storage area for waste classes 252 and 331 limited to aerosols, propane, used oil and filters;

III. Condition 62.c is hereby added as follows:

62. c. a detailed log of all materials collected and stored for transport in kept and all material storage, handling and transport is carried out in accordance with applicable regulations and guidelines.

IV. Condition 63.d is hereby revoked and replaced as follows:

63. d. The Owner may request to make changes to the monitoring program(s) to the District Manager in accordance with the recommendations of the annual report. The Owner shall make clear reference to the proposed changes in separate letter that shall accompany the annual report.
- e. Within fourteen (14) days of receiving the written correspondence from the District Manager confirming that the District Manager is in agreement with the proposed changes to the environmental monitoring program, the Owner shall forward a letter identifying the proposed changes and a copy of the correspondences from the District Manager and all other correspondences and responses related to the changes to the monitoring program, to the Director requesting the Approval be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.
- f. In the event any other changes to the environmental monitoring program are proposed outside of the recommendation of the annual report, the Owner shall follow current ministry procedures for seeking approval for amending the Approval.

V. Conditions 66 and 67 are hereby revoked and replaced as follows:

66. The Site shall be designed, developed, operated and maintained in accordance with details outlined in item 15, Schedule A.
67. a. Daily Cover - By the end of each working week, the entire working face shall be compacted and covered with a minimum thickness of 150 mm of soil cover or an approved thickness of an alternative cover material.
- b. Intermediate Cover - In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 mm of soil cover or an approved thickness of an alternative cover material shall be placed.
- c. Final Cover - The Site shall be progressively capped and closed. Within one year of a landfilling area reaching final contours as shown in Figure 3, item 15, Schedule A, a final cover consisting of a minimum thickness of 600 mm of low permeability soil overlain by 150 mm of top soil shall be constructed. The final cover shall be seeded at the first growing season following the construction of the final cover system.
- d. The Owner shall conduct a quality control program for construction of the final cover to include screening of all materials used, construction and testing of test fills, measurement of final cover thickness, density, moisture content, and observation of construction procedures.

VI. The following Conditions are hereby added to the Approval:

Contingency Plan Triggers and Mechanism

68. The Owner shall implement the groundwater trigger mechanism and contingency plans outlined in section 10.4 of item 15, Schedule A as per MOECC recommendations outlined in item 16, Schedule A.
69. a. The Owner shall compare monitoring results obtained from the surface water monitoring program, at stations S4 and S9, with the trigger levels of the trigger parameters listed in the table below and the background levels to identify any potential leachate impact to the receiving surface water.

Surface Water Parameter Triggers for Locations S4 and S9

Effluent Parameter	Daily Concentration (mg/L)
Ammonia (unionized)	0.02
Chloride	120
Iron	0.3
Boron	0.2
Copper	0.005
Total Phosphorus	0.03
Zinc	0.02

- b. In the event that a surface water monitoring result for any one (1) of the parameters listed in the above table exceeds their corresponding trigger level or background value, for either S4 or S9, the Owner shall re-sample within one (1) month period to confirm the exceedence for any of those parameters at either of those locations.
- c. In the event that the exceedance of the greater of either the trigger level or background value, is not confirmed for surface water trigger parameters, after the second round of sampling is conducted, then, the Owner shall resume the normal monitoring program.
- d. In the event that the exceedance of the greater of either the trigger level or background value in surface waters is confirmed after the second round of sampling conducted, the Owner shall implement the contingency measures outlined in item 15, Schedule A, as approved by the Director, and conduct monitoring for the trigger parameters specified in above table at a monthly frequency.
- e. After the implementation of the contingency measures, the Owner shall resume normal operation if monitoring results for all trigger parameters from three (3) consecutive sampling events are below the greater of the trigger levels or background values for surface water parameters.

The following items are added to Schedule A:

- 15. TRI-R Landfill Site Design and Operations Plan, prepared by ResEnv Consulting Limited, dated February 5, 2016.
- 16. Memorandum dated August 15, 2016, from Debra Abbott, MOECC Hydrogeologist.
- 17. Memorandums dated December 8, 2016 and March 22, 2017, from Eva Maciaszek, MOECC Surface Water Specialist.
- 18. Two letter packages dated December 21, 2016, from ResEnv Consulting Limited, in response to MOECC surface water and groundwater comments.

Schedule C is hereby revoked and replaced with the following:

Time of the Year (see footnote #1)	Locations (see footnote #2)	Parameters (see footnote #3)
Spring freshet	SW1, SW2, S1, S2, S4, SW5, S6, S7, S8, S9	Schedule 5 Column 3
Summer low flow	SW1, SW2, S1, S2, S4, SW5, S6, S7, S8, S9	Schedule 5 Column 3
Fall high flow	SW1, SW2, S1, S2, S4, SW5, S6, S7, S8, S9	Schedule 5 Column 3
Monthly, May through November	S1, S2, S4, SW5, S6, S7, S8, S9	Flow

Note #: Spring freshet typically falls in May, summer low flow during mid-August and fall high flows in November.

Note #2: Locations are as depicted in Figure 2 of the draft *TRI-R Landfill Site Design and Operations Plan*, prepared by ResEnv Consulting Limited and dated February 5, 2016, with the exception of sampling location S9 which will be a new location that will be located most down gradient on the western stream, on the site.

Note#3: Required analyses are outlined in Schedule 5, Column 3 of the *Landfill Standards A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites* (MOE, 2012)

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

Condition 22 is added to specify the approved volume and limit of fill and also to require surveys to ensure the site does not fill beyond what is approved.

Condition 55 is added to allow for temporary storage and transfer of waste classes 252 and 331 limited to aerosols, propane, used oil and filters.

Condition 62.c is added to ensure proper record keeping and handling of all material.

Condition 63 is added to provide a procedure for amendments to the Approval.

Condition 66 is added to ensure the Site is designed and operated as approved.

Condition 67 is added to ensure daily, intermediate and final cover are applied to prevent off site impact and ensure site is capped progressively.

Condition 68 and 69 specify trigger levels and contingency procedures.

Schedule C is revoked and replaced to amend the monitoring program.

This Notice shall constitute part of the approval issued under Approval No. A521003 dated June 28, 2011 and subsequent amendments.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the

Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

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

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 28th day of March, 2017



Dale Gable, P.Eng.

Director

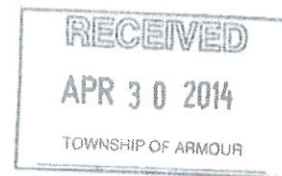
appointed for the purposes of Part II.1 of the
Environmental Protection Act

NP/

c: Area Manager, MOECC North Bay

c: District Manager, MOECC Sudbury

Jason T. Balsdon, ResEnv Consulting Limited, The Corporation of the Village of Burk's Falls



Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A521003

Notice No. 2

Issue Date: April 9, 2014

The Corporation of the Village of Burk's Falls
Post Office Box, No. 160
Burk's Falls, Ontario
P0A 1C0

Site Location: TRI Communal Landfill Armour
141 Chetwynd Rd Township of Armour
Armour Township, District of Parry Sound
P0A 1C0

You are hereby notified that I have amended Approval No. A521003 issued on June 8, 2011 for use and operation of a 1.0 hectares landfilling area within a total site area of 20.2 hectares having a total capacity of 58,800 cubic meters excluding final cover, as described by the final contours of Item 9, Schedule "A" , as follows:

I. Condition 52 of Notice dated November 15, 2011 is hereby revoked. The report entitled *TRI-R Landfill Site Revised Contingency Plan*, dated July 2012, prepared by Genivar submitted as per requirements of Condition 52 is hereby added to the Schedule "A".

II. Condition 22.b is hereby revoked and replaced with the following condition:

22.b By December 2014 and on an annual basis thereafter, the Owner shall provide the District Manager the results of a survey conducted by a licensed Ontario Land Surveyor to ensure that final contours referenced in Condition 22.a are not exceeded.

III. The following Conditions are hereby added to the Approval:

66. a. The Owner shall ensure that recommendations outlined in Items 13 and 14, Schedule "A" are implemented in the monitoring program and the reporting requirements.

b. The Owner shall include in the 2014 Annual Monitoring Report a complete assessment of the adequacy of the monitoring well network to reliably document background groundwater quality in relevant stratigraphic units (upper bedrock and the soil unit), characterize leachate quality, monitor the migration of the leachate from the fill in the soil and upper bedrock units and determine the fate of the leachate impacted groundwater.

67. One year prior to the anticipated date of the Site reaching capacity, as reflected in final contours of Item 9, Schedule "A", the Owner shall submit to the Director for approval an application and supporting documentation for the expansion of the Site or a closure plan in accordance with Condition 64 of the Approval.

The following Items are added to Schedule "A":

11. *TRI-R Landfill Site Revised Contingency Plan*, dated July 2012, prepared by Genivar.
12. Letter package dated October 29, 2012 from Jason T. Balsdon, M.A.Sc., P. Eng., Genivar, regarding Condition 22.b and current site conditions and improvements.
13. Memorandums dated Dec 19, 2013 and Dec 30, 2013 from Debra Abbott, Hydrogeologist, MOE, containing groundwater related comments.
14. Memorandums dated Dec 20, 2013 and Jan 7, 2014 from Ed Snucins, Surface Water Specialist, MOE, containing surface water related comments.

Schedule B is hereby revoked and replaced with the following:

Groundwater Sampling Location	Frequency	Parameters
BH10-1, BH10-2, BH03-1, BH03-2, BH07-1, BH07-2	September	Schedule 5 Column 1, Comprehensive List of Parameters (Without the Volatile Organics), <i>Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites</i>
BH1, BH2, BH3, BH03-1, BH03-2, BH03-3, BH07-1, BH07-2, BH07-3, BH07-4, BH10-1, BH10-2	May	Schedule 5 Column 2, Indicator List of Parameters (Without the Volatile Organics), <i>Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites</i>

All new wells	May and September for the first two years after installation	Schedule 5 Column 1, Comprehensive List of Parameters (Without the Volatile Organics), <i>Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites</i>
---------------	--	---

Schedule C is hereby revoked and replaced with the following:

Surface Water Sampling Location	Frequency	Parameters
SW-SEEP2, S1, S2, S4, SW1, SW2, and - a new background station up stream of S2 - a seepage between S2 and S4	May and September	Schedule 5 Column 3 Comprehensive List of Parameters, <i>Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites</i>
S1, S2, S4, and - a new background station up stream of S2 - a seepage between S2 and S4	June, July, August, October, November	Schedule 5 Column 3 Comprehensive List of Parameters, <i>Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites</i>

The reason for this amendment to the Approval is to reflect current conditions at the Site and to upgrade the groundwater monitoring network to reliably assess groundwater impacts from the fill area.

This Notice shall constitute part of the approval issued under Approval No. A521003 dated June 8, 2011.

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

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

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
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) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

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

DATED AT TORONTO this 9th day of April, 2014



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

NP/

c: Area Manager, MOE North Bay

c: District Manager, MOE Sudbury

Jason T. Balsdon, M.A.Sc., P.Eng., ResEnv Consulting Limited

RECEIVED NOV 21 2011



Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A521003

Notice No. 1

Issue Date: November 15, 2011

The Corporation of the Village of Burk's Falls
Post Office Box, No. 533
Burk's Falls, Ontario
P0A 1C0

Site Location: TRI Communal Landfill Armour
141 Chetwynd Rd. Township of Armour
Armour Township, District of Parry Sound
P0A 1C0

*Revoked by amendment
dated June 8, 2011*

You are hereby notified that I have amended Approval No. A521003 issued on April 16, 2008 for a waste disposal site (landfill), having a landfilling area of 0.8 hectares within a total site area of 20.2 hectares, as follows:

Pursuant to Condition 52 in Approval No. A521003, the receipt of the Contingency Plan dated December 17, 2010 is acknowledged, subject to the Condition 52 listed herein.

Item #1. Condition number 52 of the Approval No. 521003 is hereby revoked and replaced with the following:

52. Within six (6) months of issuance of this Notice, the Owner shall submit a Contingency Plan to the Director for approval that has the following features as a minimum:

- a) Establish trigger concentrations of contaminants at specific wells and at specific water sampling location to trigger that contingency measures need to be taken;
- b) The trigger concentrations and/or the well locations need to be such to provide early warning to avert unacceptable discharge to the Magnetawan River if levels are exceeded;
- c) An exceedance of any trigger concentration shall initiate contingency measures to ensure that groundwater and surface water discharging to the Magnetawan River does not exceed Ontario's Provincial Water Quality Objectives;
- d) The trigger points be protective of the tributary of the Magnetawan River that is on the Site in addition to being protective of the Magnetawan River;

- e) Clear guidance for required actions to be taken should unacceptable impact be determined; and
- f) time frames for the implementation of the various aspects of the Contingency Plan such as re-sampling, reporting to the Ministry and implementation of the remedial measures.

The reasons for this amendment to the Approval No. A521003 are as follows:

1. The Site needs a Contingency Plan to identify and respond to contamination issues. The Contingency Plan for the Site that was submitted to the Ministry on December 17, 2010 as was required by Condition 52 of Approval No. A521003 was deficient in the following areas:
 - a) Proposed compliance point groundwater wells BH03-2/BH07-2 are not down gradient of the landfill and thus cannot be used to monitor leachate impacts in the down gradient groundwater;
 - b) Although proposed compliance points for groundwater BH03-1/BH07-1 can serve as a trigger location, because of their proximity to the Magnetawan River, once the trigger levels are exceeded, groundwater with unacceptably high concentrations of one or more parameters would be discharging to the river. Thus, it would be too late for the listed contingency measures to be effective in preventing unacceptable discharge. There are two options available. Either the trigger concentrations need to be at lower levels to allow adequate warning so that contingency measures can be implemented and effectively reduce contaminant concentrations before PWQO's are exceeded at the discharge point, or PWQO concentration levels could be used at location(s) further up gradient, i.e. midway between the waste area and the discharge point;
 - c) Contingency measures need to provide clear guidance on the required actions to be taken should unacceptable impact occur. An assessment of their anticipated effectiveness is not sufficient; and
 - d) A natural attenuation landfill does not allow for leachate assimilation in surface water. Ministry policy requires that surface waters be maintained at either background concentrations or PWQO depending on the designation of the receiver. The Owner needs to start assessing water quality in the tributary to the Magnetawan River that is on Site and establish early detection of leachate impacts on that tributary.

The Owner needs to provide a proper Contingency Plan to the Ministry.

This Notice shall constitute part of the approval issued under Approval No. A521003 dated April 16, 2008, as amended.

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

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

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

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

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

This Notice must be served upon:

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

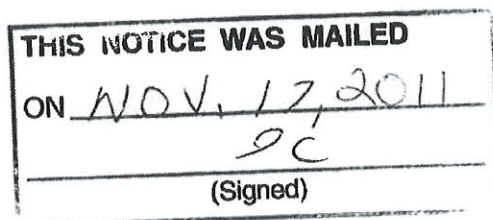
AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
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) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca

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

DATED AT TORONTO this 15th day of November, 2011



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

JC/

c: District Manager, MOE North Bay
Jason T. Balsdon, M.A.Sc., P.Eng., GENIVAR Consultants LP ✓

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Ministry of the Environment
Ministère de l'Environnement

AMENDED PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A521003
Issue Date: June 8, 2011

The Corporation of the Village of Burk's Falls
o/a TRI-R Committee
Post Office Box, No. 160
Burk's Falls, Ontario
P0A 1C0

Site Location: TRI Communal Landfill
141 Chetwynd Rd,
Armour Township, District of Parry Sound
P0A 1C0

You have applied in accordance with Section 27 of the Environmental Protection Act for approval of:

the emergency expansion of a waste disposal site (landfill), having a landfilling area of 1.0 hectares within a total site area of 20.2 hectares, being expanded from a total site capacity of 54,000 cubic metres, excluding final cover, to a capacity as described by the final contours in Item 9 in Schedule "A".

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

1. "acceptable waste" means solid, *municipal waste* including bulk *municipal waste materials* and *recyclable materials* such as *blue box material*, corrugated cardboard, boxboard, steel, tires, brush, clean wood, *WEEE* and appliances that are suitable for recycling and also includes roofing shingles;

"blue box material" means material that is specified by Regulation 273/02 of the Waste Diversion Act;

"Certificate" means this entire provisional Certificate of Approval document, issued in accordance with section 39 of the *EPA*, and includes any schedules to it, the application and the supporting documentation listed in Schedule "A";

"Director" means any *Ministry* employee appointed in writing by the Minister pursuant to section 5 of the *EPA* as a Director for the purposes of Part V of the *EPA*;

"District Manager" means the District Manager of the local district office of the Ministry in which the *Site* is geographically located;

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

"municipal waste" means the definition that is provided for municipal waste in *Regulation 347 of the Act* or as may be updated from time to time;

"Operator" means any person, other than the *Owner's* employees, authorized by the *Owner* as having the charge, management or control of any aspect of the site and includes its successors or assigns;

"Owner" means any person that is responsible for the establishment or operation of the *Site* being approved by this *Certificate*, and includes The Corporation of the Village of Burk's Falls o/a TRI-R Committee, its successors and assigns;

"PA" means the *Pesticides Act*, R.S.O. 1990, c. P-11, as amended from time to time;

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"person" includes a municipality;

"Provincial Officer" means any person designated in writing by the Minister as a provincial officer pursuant to section 5 of the OWRA or section 5 of the *EPA* or Section 17 of the *PA*;

"recyclable materials" means *municipal waste* that is suitable for sorting for recycling purposes;

"Regional Director" means the Regional Director of the local regional office of the Ministry in which the *Site* is geographically located;

"Regulation 232" or "Reg. 232" means Ontario Regulation 232/98 (New Landfill Standards) made under the *EPA*, as amended from time to time;

"Regulation 347" or "Reg. 347" means Regulation 347, R.R.O. 1990, made under the *EPA*, as amended from time to time;

"Reuse Material" is material such as books, yard decor, furniture and tools that are suitable for reuse;

"Site" means the entire TRI Communal waste disposal site located at 141 Chetwynd Rd, Armour Township, District of Parry Sound, as show in *Site* diagrams that are in the documents that are identified in items 7 and 9 of Schedule "A", having a landfilling area of approximately 1.3 hectares within a total site area of 20.2 hectares, including the buffer lands, and contaminant attenuation zone approved by this *Certificate*;

"Trained personnel" means knowledgeable in the following through instruction and/or practice:

- a. relevant waste management legislation, regulations and guidelines;
- b. major environmental concerns pertaining to the waste to be handled;
- c. occupational health and safety concerns pertaining to the processes and wastes to be handled;
- d. management procedures including the use and operation of equipment for the processes and wastes to be handled;
- e. emergency response procedures;
- f. specific written procedures for the control of nuisance conditions;
- g. Specific written procedures for refusal of unacceptable waste loads;
- h. the requirements of this *Certificate*;

"Waste Diversion and Waste Transfer Operations" means the management and transfer operations of *acceptable waste* that is described in item 8 of Schedule "A";

"WEEE" means waste electrical and electronic equipment listed in Schedules 1 through 7 of Ontario Regulation 393/04 of the Waste Diversion Act; and

"Waste Transfer Station" means the "Waste Diversion and Waste Transfer Operations" depot that is located at the *Site* and that is described in item 8 of Schedule "A".

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

TERMS AND CONDITIONS

GENERAL

Compliance

2. The *Owner* and *Operator* shall ensure compliance with all the conditions of this *Certificate* and shall ensure that any person authorized to carry out work on or operate any aspect of the *Site* is notified of this *Certificate* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

3. Any person authorized to carry out work on or operate any aspect of the *Site* shall comply with the conditions of this

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Certificate.

Build, etc. in Accordance

4. Except as otherwise provided for in this *Certificate*, the *Site* shall be designed, developed, built, operated and maintained in accordance with the supporting documentation listed in Schedule "A".

Interpretation

5. Where there is a conflict between a provision of any document, including the application, referred to in this *Certificate*, and the conditions of this *Certificate*, the conditions in this *Certificate* shall take precedence.

6. Where there is a conflict between the application and a provision in any documents listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the *Ministry* approved the amendment.

7. Where there is a conflict between any two documents listed in Schedule "A", other than the application, the document bearing the most recent date shall take precedence.

8. The conditions of this *Certificate* are severable. If any condition of this *Certificate*, or the application of any condition of this *Certificate* to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this *Certificate* shall not be affected thereby.

Other Legal Obligations

9. The issuance of, and compliance with the conditions of, this *Certificate* does not:

a. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or

b. limit in any way the authority of the *Ministry* to require certain steps be taken or to require the *Owner* and *Operator* to furnish any further information related to compliance with this *Certificate*.

Adverse Effect

10. The *Owner* and *Operator* shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the *Site*, including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

11. Despite an *Owner*, *Operator* or any other person fulfilling any obligations imposed by this *Certificate*, the person remains responsible for any contravention of any other condition of this *Certificate* or any applicable statute, regulation, or other legal requirement resulting from any act or omission that caused the adverse effect to the natural environment or impairment of water quality.

Change of Owner

12. The *Owner* shall notify the *Director* in writing, and forward a copy of the notification to the *District Manager*, within 30 days of the occurrence of any changes:

a. the ownership of the *Site*;

b. the *Operator* of the *Site*;

c. the address of the *Owner* or *Operator*;

d. the partners, where the *Owner* is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act*, R.S.O. 1990, c. B-17 shall be included in the notification; or

e. the name of the corporation where the *Owner* is or at any time becomes a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act*, R.S.O. 1990, c. C-39 shall be included in the notification.

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13. No portion of this *Site* shall be transferred or encumbered prior to or after closing of the *Site* unless the *Director* is notified in advance and sufficient financial assurance is deposited with the *Ministry* to ensure that these conditions will be carried out. In the event of any change in Ownership of the *Site*, other than change to a successor municipality, the *Owner* shall notify the successor of and provide the successor with a copy of this *Certificate*, and the *Owner* shall provide a copy of the notification to the *District Manager* and the *Director*.

Certificate of Requirement

14. Pursuant to Section 197 of the *EPA*, no person having an interest in the *Site* shall deal in any way with the *Site* without first giving a copy of this *Certificate* and a copy of Certificate of Requirement No. GB27410 to each person acquiring an interest in the *Site* as a result of the dealing.

Inspections

15. No person shall hinder or obstruct a *Provincial Officer* in the performance of their duties, including any and all inspections authorized by the *OWRA*, the *EPA* or the *PA* of any place to which this *Certificate* relates, and without limiting the foregoing to:

- a. enter upon the premises where the *Site* is located, or the location where the records required by the conditions of this *Certificate* are kept;
- b. have access to, inspect, and copy any records required by the conditions of this *Certificate*;
- c. inspect the practices, procedures, or operations required by the terms and conditions of this *Certificate*; and
- d. sample and monitor for the purposes of assessing compliance with the conditions of this *Certificate* or the *EPA*, the *OWRA* or the *PA*.

Information and Record Retention

16. Any information requested, by the *Ministry*, concerning the *Site* and its operation under this *Certificate*, including but not limited to any records required to be kept by this *Certificate* shall be provided to the *Ministry*, upon request, in a timely manner. Records shall be retained for five (5) years except for as otherwise authorized in writing by the *Director*.

17. The receipt of any information by the *Ministry* or the failure of the *Ministry* to prosecute any person or to require any person to take any action, under this *Certificate* or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:

- a. an approval, waiver, or justification by the *Ministry* of any act or omission of any person that contravenes any term or condition of this *Certificate* or any statute, regulation or other legal requirement; or
- b. acceptance by the *Ministry* of the information's completeness or accuracy.

OPERATION

Operations

18. The *Site* shall be properly operated and maintained at all times. All waste shall be managed and disposed of in accordance with the *EPA*, *Regulation 232*, *Regulation 347* (where applicable), and the requirements of this *Certificate*. At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

Service Area

19. Only waste that is generated within The Village of Burk's Falls and the Townships of Armour and Ryerson shall be landfilled at the *Site*. *Reuse Material* and *acceptable waste* may come from within a radius of 100 kilometres from the *Site*.

Waste Types

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20. Only solid non-hazardous waste, limited to *municipal waste*, shall be accepted at the *Site* for landfilling purposes.

Hours of Operation

21. (a) The maximum hours of operation of the *Site* are from Thursday to Tuesday from 8:00am. to 6:00pm; and

(b) With the prior written approval of the *Director*, the time periods may be extended to accommodate seasonal or unusual quantities of waste.

Capacity

22. (a) The *Owner* shall cease accepting and depositing waste at the *Site* when the available capacity, as defined by the final contours for the *Site* as shown in Item 9 in Schedule "A" have been reached; and

(b) Notwithstanding Condition 22(a) above, the *Owner* shall cease accepting and depositing waste at the *Site* the earliest of no later than December 18, 2013 or when an additional 4,800 cubic metres of waste beyond the existing design capacity of 54,000 cubic metres have been accepted at the *Site*.

Design and Operations Report

23. The Design and Operations Report shall consist of the items in Schedule "A", and shall be retained, kept up to date through periodic revisions, and be available for inspection by *Ministry* staff. Changes to the Design and Operations Report shall be submitted to the *Director* for approval.

Signage

24. A sign shall be posted and maintained at the entrance to the *Site* in a manner that is clear and legible, and shall include the following information:

- a. the name of the *Site* and *Owner*;
- b. this *Certificate* number;
- c. the name of the *Operator*;
- d. the normal hours of operation;
- e. the allowed waste types, and any waste types explicitly prohibited by Conditions of this *Certificate*;
- f. a telephone number to which complaints may be directed;
- g. a twenty-four (24) hour emergency telephone number (if different from above); and
- h. a warning against dumping outside the *Site*.

Waste Inspection

25. All waste shall be inspected by *Trained personnel* prior to being accepted at the *Site* to ensure that the waste is of a type approved for acceptance under this *Certificate*.

26. In the event that any waste load is refused, a record shall be made in the daily log book of the reason the waste was refused and the origin of the waste.

Cover

27. Cover material shall be applied in accordance with *Reg. 232*

28. Daily and intermediate cover material may include the following non-hazardous materials:

i) Uncontaminated soil;

ii) Contaminated soil that is less than 10% of the Toxicity Characteristic Leaching Procedure (TCLP) values as outlined in Schedule 4 of *Reg. 347* as amended from time to time;

iii) Notwithstanding Condition 28 a) ii), contaminated soils which are less than 10% of the TCLP values except for benzene shall be considered acceptable for use as daily and intermediate cover if the TCLP value for

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benzene does not exceed 0.4 mg/L;

- iv) Uncontaminated sand or non-hazardous foundry sand that is less than 10% of the TCLP values;
- v) Wood chips; and
- vi) Tarps or equivalent.

29. Any contaminated soil above the 10% TCLP values shall be considered a waste and shall be disposed in the appropriate manner and in accordance with applicable legislation and regulations.

30. The use of contaminated soil for daily/intermediate cover referenced in Condition 28 of this *Certificate*, shall be subject to the Generator demonstrating to the *Owner* with analytical test results that the soils do not exceed the soils criteria for land use for full depth Generic Site Condition Standards in non-potable groundwater condition as outlined in Table 3 in the Regulation 153/04 document entitled: "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act."

31. As part of its Annual Report that is required by Condition 53 of this *Certificate*, the *Owner* shall notify the *Director* of the volume contaminated soils (waste) accepted at the *Site* for daily/interim cover. The volume of contaminated soils stored at the *Site* shall not exceed the three months limitation of the annual daily/ interim cover material requirements as determined by the previous annual report. The *Owner* shall provide to the *District Manager* an annual report on the cumulative contaminated soils stored on the *Site*. The *Owner* shall ensure at all times that the stockpiled contaminated soils shall produce no off-Site nuisance odours or adverse effects. In the event, a reported incident of odour concentrations are detected at the *Site*, which causes a nuisance and pose a threat to the health and safety of person(s) and/or the environment, the *Owner* shall forthwith implement a contingency plan to immediately abate the nuisance odour and/or run-off that may originate from the stock pile.

32. The use of any other alternative cover materials aside for that outlined in Condition 28 of this *Certificate* as daily or intermediate cover material is subject to approval by the *Director*.

33. Use of alternative daily or intermediate cover materials shall be discontinued within two (2) working days of receipt of written notification from the *District Manager*, stating that the use of the alternative daily or intermediate cover materials at the *Site* has proven to be environmentally unsuitable.

34. If confirmatory testing of the contaminated soil used for daily or intermediate cover indicates an exceedance of 10% of the TCLP value and/or 0.4 mg/L of benzene, the *Owner* shall report any failed sample of the contaminated soil testing to the *District Manager* forthwith.

35. Contaminated soil for use as daily cover shall be stockpiled in areas at the *Site* where there would be no run-off to surface water.

36. Contaminated soil may be used for daily/intermediate cover but only on slopes where surface water drainage is into the waste fill and isolated from any storm water collection system.

Vector/Vermin

37. The *Site* shall be operated and maintained such that vermin, vectors, dust, litter, odour, noise and traffic do not create a nuisance.

Side Slopes

38. The resulting final contour of the side slopes of the locations where waste have been placed shall not exceed one unit vertical to four units horizontal.

Burning

39. Clean wood waste may be burned at the *Site* in a designated location, provided the burning is carried out in accordance with Ministry Guideline C-7 "Burning at Landfill Sites" dated April 1994.

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Training Plan

40. A training plan shall be developed and maintained for all employees that operate the *Site*. Only *Trained personnel* may operate the *Site* or carry out any activity required under this *Certificate*.

41. The *Owner* shall ensure that *Trained personnel* are available at all times during the hours of operation of this *Site*. *Trained personnel* shall supervise all transfer or processing of waste material at the *Site*.

Site Security

42. The *Site* shall be operated and maintained in a secure manner. During non-operating hours, the *Site* entrance and exit gates shall be locked and the *Site* shall be secured against access by unauthorized persons.

Site Inspection

43. An inspection of the entire *Site* and all equipment on the *Site* shall be conducted twice per week to ensure that: the *Site* is secure; that the operation of the *Site* is not causing any nuisances; that the operation of the *Site* is not causing any adverse effects on the environment; and that the *Site* is being operated in compliance with this *Certificate*. Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the *Site* if needed.

44. A record of the inspections, including the following information, shall be kept in the daily log book:

- a. the name and signature of person that conducted the inspection;
- b. the date and time of the inspection;
- c. a list of any deficiencies discovered;
- d. any recommendations for remedial action; and
- e. the date, time and description of actions taken.

Complaints Procedure

45. If at any time, the *Owner* receives complaints regarding the operation of the *Site*, the *Owner* shall respond to these complaints according to the following procedure:

a. The *Owner* shall record and number each complaint, either electronically or in a separate log book, along with the following information:

- i. the nature of the complaint;
- ii. if the complaint is odour or nuisance related, the weather conditions and wind direction at the time of the complaint;
- iii. the name, address and telephone number of the complainant (if provided); and
- iv. the time and date of the complaint;

b. The *Owner*, upon notification of the complaint, shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint, notify the *District Manager* of the complaint within 48 hours of receiving the complaint, and forward a formal reply to the complainant; and

c. The *Owner* shall complete and retain on-site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents.

Emergency Response Plan

46. Within sixty (60) days of issue of this amendment to the *Certificate*, the *Owner* shall submit an Emergency Response Plan to the local municipal authority and the local fire services authority for their acceptance. Within thirty (30) days of acceptance by the local municipal authority and the local fire services authority, the *Owner* shall submit the Emergency Response Plan to the *District Manager*. The Emergency Response Plan shall include, but not necessarily be limited to:

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- (1) emergency response procedures to be undertaken in the event of a spill or process upset, including specific clean up methods for each different type of waste the *Site* is approved to accept;
- (2) a list of equipment and communications systems and spill clean up materials available in case of an emergency;
- (3) contingency procedures to be followed in the event of equipment malfunction, a labour disruption, transportation disruption, inability of receiving sites to accept waste or other business disruption to the operation; and
- (4) notification protocol with names and telephone numbers of persons to be contacted, including persons responsible for the *Site*, the Ministry's District Office and Spills Action Centre, the local municipal fire department, the local municipal authority, the local Medical Officer of Health, the Ministry of Labour, and the names and telephone numbers of waste management companies available for emergency response.

47. (1) At least annually, the *Owner* shall review the Emergency Response Plan and shall update the plan if necessary;

(2) The review referred to in 47 (1) shall ensure that the names and telephone numbers of the persons to be contacted, as required under Condition 46.(4), are up-to-date, and that these numbers are prominently displayed and immediately available to all staff and emergency response personnel; and

(3) Changes to the Emergency Response Plan must be acceptable to the local municipal authority and to the local fire services authority prior to instituting the modifications. Within thirty (30) days of acceptance of the changes to the Emergency Response Plan by the local municipal authority and the local fire services authority, the *Owner* shall submit the updated Emergency Response Plan to the *District Manager*.

48. The equipment, materials and personnel requirements outlined in the Emergency Response Plan shall be immediately available on the *Site* at all times. The equipment shall be kept in a good state of repair and in a fully operational condition.

49. All staff that operate the *Site* shall be fully trained in the use of the contingency and Emergency Response Plan, and in the procedures to be employed in the event of an emergency.

50. The *Owner* shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation of this *Site* and immediately implement the emergency response plan if required.

Daily Log Book

51. A daily log shall be maintained, either electronically or in written format, and shall include the following information as a minimum:

- a. the date;
- b. quantity and source of waste received;
- c. a record of daily inspections required by this *Certificate*;
- d. a record of any spills or process upsets at the *Site*, the nature of the spill or process upset and the action taken for the clean up or correction of the spill, the time and date of the spill or process upset, and for spills, the time that the *Ministry* and other persons were notified of the spill in fulfilment of the reporting requirements in the *EPA*;
- e. a record of any waste refusals which shall include; amounts, reasons for refusal and actions taken; and
- f. the signature of the *Trained Personnel* conducting the inspection and completing the report.

52. Any information requested by a *Director* or a *Provincial Officer* concerning the *Site* and its operation under this *Certificate*, including but not limited to any records required to be kept by this *Certificate*, shall be provided to the *Ministry* upon request in a timely manner. Records shall be retained for 5 years except for as otherwise authorized in writing by the *Director*.

Annual Report

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53. A written report on the development, operation and monitoring of the *Site*, shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the *District Manager*, by no later than April 30, 2012 and every April 30 thereafter, and shall cover the 12 month period preceding each anniversary date.

54. The Annual Report shall include the following:

- a. the results and an interpretive analysis of the results of groundwater and surface water monitoring, including an assessment of the need to amend the monitoring programs;
- b. an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the *Site*, and the adequacy of and need to implement the contingency plans;
- c. *Site* plans showing the existing contours of the *Site*; areas of landfilling operation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; previously existing *Site* facilities; facilities installed during the reporting period; and *Site* preparations and facilities planned for installation during the next reporting period;
- d. calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the *Site* during the reporting period and a calculation of the total volume of *Site* capacity used during the reporting period;
- e. a calculation of the remaining capacity of the *Site* and an estimate of the remaining *Site* life;
- f. a summary of the total annual quantity (cubic meters) of waste received at the *Site*.
- g. a summary of any complaints received and the responses made;
- h. a discussion of any operational problems encountered at the *Site* and corrective action taken;
- i. a report on the status of all monitoring wells;
- j. any other information with respect to the *Site* which the *Regional Director* may require from time to time;
- k. a record of the amount of contaminated soil, if any, used for daily and intermediate cover in the preceding year; and
- l. The amount of contaminated soil stored on *Site*.

Waste Transfer Station - Waste Diversion and Waste Transfer Operations

55. The *Waste Diversion and Waste Transfer Operations* at the *Site* shall be in accordance with Item 8 of Schedule "A" and may include the following:

- i) a Reuse facility of approximate size of 20 feet by 40 feet for *Reuse Material*;
- ii) a blue box sorting area in a Quonset hut of approximate area of 20 feet by 40 feet;
- iii) a recycle work area for Cardboard and paper fibre;
- iv) a glass storage building; and
- v) a storage building for *WEEE*.

56. Only *acceptable waste* and *Reuse Material* may be accepted at the *Waste Diversion and Waste Transfer Operations*.

57. The *Site* may have a reuse program as described in Item 9 of Schedule "A" that accepts *Reuse Material* for storage and reuse by the public.

58. The *Waste Diversion and Waste Transfer Operations*, shall be operated and maintain in accordance with the *Certificate* and the plans and specification as specified in items 7, 8 and 9 of Schedule "A".

59. The *Waste Diversion and Waste Transfer Operations* may receive up to a daily maximum of 240 cubic metres of *acceptable waste* and shall not weigh more than 120 tonnes.

60. a) The amount of *acceptable waste* stored at the *Waste Diversion and Waste Transfer Operations* shall not exceed 300 cubic metres which shall not weigh more than 150 tonnes;

b) The storage of *acceptable waste* and *Reuse Material* shall be in accordance with Item 8 of Schedule "A".

61. All waste destined for diversion shall be segregated either into bins or in designated areas as defined by barriers. All bins and designated waste storage areas shall be clearly labelled.

CONTENT COPY OF ORIGINAL

62. The *Owner* shall ensure that:

(a) white goods which contain refrigerants received at the *Waste Transfer Station* shall either have the refrigerant removed prior to removal from the *Waste Transfer Station* or shall be shipped from the *Waste Transfer Station* only to facilities where the refrigerants can be removed by a licensed technician in accordance with Ontario Regulation 189 of the *Act*; and

(b) a detailed log is kept of all white goods which contain refrigerants received is maintained which includes all information required by Regulation 189 of the *Act* including the following information:

(i) date of the record;

(ii) types, quantities and source of white goods which contain refrigerants received;

(iii) destination of the white goods; or

(iv) the details on removal of refrigerants, if conducted on-*Site*, and the quantities and destination of the refrigerants transferred from the *Site*.

Monitoring

63. (a) The *Owner* shall follow the sampling and analyses program that is outlined in Schedule "B" of the *Certificate* for groundwater at the *Site*;

(b) The *Owner* shall follow the sampling and analyses program that is outlined in Schedule "C" of the *Certificate* for surface water and leachate at the *Site* and the Magnetawan River;

(c) Results from the sampling and analyses shall be submitted to the *District Manager* in electronic format (Microsoft Excel or equivalent) along with the annual monitoring reports that is required by Condition 54 of the *Certificate*; and

(d) Upon written request by the *Owner*, the *District Manager* may modify the sampling and/or analyses requirements outlined in Schedule "B" and Schedule "C" of the *Certificate*.

Closure Plan

64. At least one (1) year prior to the anticipated date of closure of this *Site*, the *Owner* shall submit to the *Director* for approval, with copies to the *District Manager*, a detailed *Site* closure plan pertaining to the termination of landfilling operations at this *Site*, post-closure inspection, maintenance and monitoring, and end use. The plan shall include (but not be limited to) the following:

a. a plan showing *Site* appearance after closure;

b. a description of the proposed end use of the *Site*;

c. a descriptions of the procedures for closure of the *Site*, including:

i. advance notification of the public of the landfill closure;

ii. posting of a sign at the *Site* entrance indicating the landfill is closed and identifying any alternative waste disposal arrangements;

iii. completion, inspection and maintenance of the final cover and landscaping;

iv. *Site* security;

v. removal of unnecessary landfill-related structures, buildings and facilities;

vi. final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas; and

vii. a schedule indicating the time-period for implementing sub-conditions i) to vi) above;

d. descriptions of the procedures for post-closure care of the *Site*, including:

i. operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;

ii. record keeping and reporting; and

iii. complaint contact and response procedures;

e. an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and

f. an updated estimate of the contaminating life span of the *Site*, based on the results of the monitoring programs to date.

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

CONTENT COPY OF ORIGINAL

Schedule "A"

1. Application for a Provisional Certificate of Approval dated February 20, 2007, signed by Leanne Crozier, TRI R Administrator, including all supporting documentation.
2. Report entitled "Technical Support Document, Emergency Provisional Certificate of Approval, TRI-R Committee Landfill Site, Township of Armour, Village of Burk's Falls and Township of Ryerson" dated February 2007, prepared by Jagger Hims Limited.
3. Correspondence dated November 14, 2007 in response to MOE information request, prepared by Jagger Hims Limited.
4. Application for an amendment to the *Certificate* dated July 21, 2009 and signed by Karen Fraser, TRI R Administrator, including all supporting documentation.
5. Report entitled "Technical Support Document, Emergency Provisional Certificate of Approval, TRI-R Committee Landfill Site, Township of Armour, Village of Burk's Falls and Township of Ryerson" dated July 2009.
6. Report entitled "Environmental Impact study Proposed Tri-R Landfill Site Expansion Part of Lot 8 and Lot 9, Concession 8, Township of Armour, District of Parry Sound, prepared by Jagger Hims Limited for Tri-R Committee, dated November 2008.
7. Report entitled "TRI-R Committee Landfill Site, Design and Operations Plan, prepared by Jagger Hims Limited for Tri-R Committee, dated October 2009.
8. Letter dated March 1, 2011, addressed to Jim Chisholm, Senior Waste Engineer, Ministry of the Environment from Jason Balsdon, M.A.Sc., P.Eng., Genivar consulting. Letter includes Design and Operations Plan for Municipal Waste Recycling and Reuse Program for Site and was prepared by Amy Tilley.
9. Report entitled "Tri-R Landfill Site, Revised Design and Operations Plan, prepared by Genivar Inc. for Tri-R Committee, dated May 2011.
10. May 25, 2011 e-mail from Jason Balsdon of Genivar consulting enclosing a copy of Certificate of Requirement No. GB27410 for the *Site*.

Schedule "B"

SAMPLING AND ANALYSES for GROUNDWATER

Time of Year	Locations(see footnote #1)	Analyses (see footnote #2)
Late Spring	BH1, BH2, and all new wells	Schedule 5 Column 1 and carbonate and bicarbonate
Late Spring	BH03-1/07-1	Schedule 5 Column 2 and carbonate and bicarbonate
Early Fall	BH1, BH2, BH3, BH4, Dug Well, BH03-1/07-1, BH03-2/07-2, BH03-3/07-3, BH07-4, BH07-5 and all new wells	Schedule 5 Column 2 and carbonate and bicarbonate

Note #1-Locations are from Site Plan that is contained in item 5 of Schedule "A"

Note #2-Required analyses are outlined in Schedule 5 of *Regulation 232* of the *Act*

Schedule "C"

SAMPLING AND ANALYSES for SURFACE WATER/LEACHATE

CONTENT COPY OF ORIGINAL

Time of Year	Locations (see footnote #3)	Analyses (see footnote #4)
May	SW-SEEP, SW-SEEP-2, S1, S2, S4, SW1, SW2	Schedule 5 Column 1
June	S1, S2, S4,	Schedule 5 Column 1
July	S1, S2, S4,	Schedule 5 Column 1
August	S1, S2, S4,	Schedule 5 Column 1
September	S1, S2, S4, SW-SEEP, SW-SEEP-2 SW1, SW2	Schedule 5 Column 1
October	S1, S2, S4,	Schedule 5 Column 1
November	S1, S2, S4,	Schedule 5 Column 1

Note #3-Locations are from *Site Plan* that is contained in item 5 of Schedule "A"

Note #4-Required analyses are outlined in Schedule 5 of *Regulation 232* of the *Act*

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

1. The reason for Condition 1 is to simplify the wording of the subsequent conditions and define the specific meaning of terms as used in this Provisional Certificate of Approval.
2. The reason for Conditions 2, 3, 5, 6, 7, 8, 9, 10, 11, 18 and 19 is to clarify the legal rights and responsibilities of the *Owner* and *Operator*.
3. The reason for Condition 4 is to ensure that the *Site* is operated in accordance with the application and supporting documentation submitted by the *Company*, and not in a manner which the *Director* has not been asked to consider.
4. The reasons for Condition 12 is to ensure that the *Site* is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the *Director* is informed of any changes.
5. The reasons for Condition 13 are to restrict potential transfer or encumbrance of the *Site* without the approval of the *Director* and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Certificate of Approval.
6. The reason for Conditions 14, is to ensure that all parties involved in any future dealings with the property where the *Site* is located are aware of its use as a waste disposal site.
7. The reason for Condition 15 is to ensure that appropriate Ministry staff have ready access to the *Site* for inspection of facilities, equipment, practices and operations required by the conditions in this Certificate of Approval. This condition is supplementary to the powers of entry afforded a *Provincial Officer* pursuant to the EPA and OWRA.
8. The reason for Conditions 18 is to ensure that the *Site* is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.
9. The reasons for Conditions 19, 20, 21, 22, and 23 are to specify the approved service area from which waste may be accepted at the *Site*, the types of waste that may be accepted at the *Site*, the capacity of the *Site*, the maximum rate at which the *Site* may receive waste, and the details of daily operations based on the Municipality's application and supporting documentation.
10. The reason for Conditions 24 is to ensure that users of the *Site* are fully aware of important information and

CONTENT COPY OF ORIGINAL

restrictions related to *Site* operations and access under this Certificate of Approval.

11. The reasons for Conditions 25 and 26 is to ensure that all incoming wastes are inspected to ensure compliance with this Certificate, and to ensure that a record is made of any waste load refusal.

12. The reason for Conditions 27 to 36 inclusive is to outline allowable cover material and its conditions of use.

13. The reasons for Condition 37 and 38 are to ensure that all wastes are properly managed in accordance with *Reg. 347, Reg. 232, Ministry Guidelines*, and otherwise in a manner that protects the health and safety of people and the public.

14. The reason for Condition 39 is to outline the conditions that burning would be allowed at the *Site*.

The reason for Condition 40 and 41 is to ensure that the *Site* is operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.

15. The reasons for Condition 42 is to ensure the controlled access and integrity of the *Site* by preventing unauthorized access when the *Site* is closed and no *Site* attendant is on duty.

16. The reasons for Conditions 43 and 44 are to ensure that routine *Site* inspections are completed, and that detailed records of *Site* inspections are recorded and maintained for inspection and information purposes.

17. The reason for Condition 45 is to ensure that any complaints regarding *Site* operations at the *Site* are responded to in a timely manner.

18. The reason for Conditions 46 to 50 inclusive is to ensure that an Emergency Response Plan is developed and maintained at the *Site* and that staff are properly trained in the operation of the equipment used at the *Site* and emergency response procedures.

19. The reasons for Conditions 50 and 51 is to provide for the proper assessment of effectiveness and efficiency of *Site* design and operation, their effect or relationship to any nuisance or environmental impacts, and the occurrence of any public complaints or concerns. Record keeping is necessary to determine compliance with this Certificate of Approval, the EPA and its regulations.

20. The reasons for Conditions 52, and 53 are to ensure that regular review of *Site* development, operations and monitoring data is documented and any possible improvements to *Site* design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing *Site* activities and for determining the effectiveness of *Site* design.

21. The reason for conditions 56 to 62 inclusive is to outline the allowable waste diversion activities at the *Site*.

22. The reason for Conditions 63 is to ensure that an adequate monitoring program is in place to prevent off-site impacts to surface water and groundwater.

23. The reasons for Condition 64 and 65 is to ensure that the *Site* is closed in accordance with Ministry standards and to protect the health and safety of the public and the environment.

This Provisional Certificate of Approval revokes and replaces Certificate(s) of Approval No. A521003 issued on April 16, 2008.

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.

CONTENT COPY OF ORIGINAL

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 8th day of June, 2011

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

JC/
c: District Manager, MOE North Bay
Jason T. Balsdon, Jagger Hims Limited



RECEIVED AUG 24 2010

Ministry of the Environment
Ministère de l'Environnement

**CERTIFICATE OF APPROVAL
MUNICIPAL AND PRIVATE SEWAGE WORKS**
NUMBER 6402-854LHL
Issue Date: August 20, 2010

The Corporation of the Village of Burk's Falls
Post Office Box, No. 160
Burk's Falls, Ontario
P0A 1C0

Site Location: Tri-R Committee Landfill
141 Chetwynd Rd
Armour Township, District of Parry Sound

You have applied in accordance with Section 53 of the Ontario Water Resources Act for approval of:

the establishment of leachate seep control sewage works at the existing Tri-R Committee Landfill located at 141 Chetwynd Road, Lot 8 and 9, Concession 8, Township of Armour, consisting of the following:

PROPOSED WORKS:

Relocation of Building Material Area

- relocation of the existing Building Material Area to a 45 m setback distance from the seepage location SW-SEEP 2 to re-establish the seasonal surface watercourse drainage path and reduce the seepage rate from the SW-SEEP 2 location;

SW-Seep Sand Mantle

- one (1) sand mantle with approximate dimensions of 40 m long adjacent to the waste footprint x 30 m wide x 0.90 m deep and a slope of 6H:1V, covered with 0.10 m deep top soil and planted with aquatic vegetation, constructed over an existing overburden or exposed rock, located south of the existing waste footprint, and designed to control seepage outbreaks and attenuate leachate plum moving towards Magnetawan River;

SW-Seep 2 Sand Mantle

- one (1) sand mantle with approximate dimensions of 40 m long adjacent to the Building Material Area x 40 m wide x 0.90 m deep and a slope of 6H:1V, covered with 0.10 m deep

top soil and planted with aquatic vegetation, constructed over an existing overburden or exposed rock, located south of the existing waste footprint, and designed to control seepage outbreaks and attenuate leachate plume moving towards Magnetawan River; and

- including all controls and associated appurtenances.

all in accordance with the Application for Approval of Municipal and Private Sewage Works submitted by The Corporation of the Village of Burk's Falls and the following documents:

1. "Technical Support Document, TRI-R Landfill Site Leachate Seep Control System" dated April 2010 prepared by GENIVAR Consultants LP, Newmarket, Ontario.
2. Letter from Jason T. Balsdon, P. Eng., GENIVAR Consultants LP to Stefanos Habtom, P. Eng. dated May 28, 2010 providing a response to additional information request letter dated May 4, 2010 regarding the design and performance of the proposed sewage works.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

"*Act*" means the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended;

"*Certificate*" means this entire certificate of approval document, issued in accordance with Section 53 of the *Act*, and includes any schedules;

"*Daily Concentration*" means the concentration of a contaminant in the effluent discharged over any single day, as measured by a composite or grab sample, whichever is required;

"*Director*" means any Ministry employee appointed by the Minister pursuant to section 5 of the *Act*;

"*District Manager*" means the District Manager of the North Bay District Office of the Ministry;

"*Ministry*" means the Ontario Ministry of the Environment;

"*Owner*" means The Corporation of the Village of Burk's Falls and includes its successors and assignees;

"*Proposed Works*" means the sewage works described in the *Owner* 's application, this Certificate and in the supporting documentation referred to herein, to the extent approved by this Certificate;

"*Substantial Completion*" has the same meaning as "*substantial performance*" in the Construction Lien Act; and

"*Works*" means the sewage works described in the *Owner* 's application, this Certificate and in

the supporting documentation referred to herein, to the extent approved by this Certificate and includes both *Previous Works* and *Proposed Works*.

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

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

- (1) The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of the *Works* is notified of this *Certificate* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
- (2) Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the Works in accordance with the description given in this *Certificate*, the application for approval of the works and the submitted supporting documents and plans and specifications as listed in this *Certificate*.
- (3) Where there is a conflict between a provision of any submitted document referred to in this *Certificate* and the Conditions of this *Certificate*, the Conditions in this *Certificate* shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.
- (4) Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.
- (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 invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this certificate shall not be affected thereby.

2. EXPIRY OF APPROVAL

The approval issued by this *Certificate* will cease to apply to those parts of the *Works* which have not been constructed within five (5) years of the date of this *Certificate*.

3. CHANGE OF OWNER

- (1) The Owner shall notify the *District Manager* and the *Director*, in writing, of any of the following changes within thirty (30) days of the change occurring:
 - (a) change of *Owner*;

- (b) change of address of the *Owner*;
 - (c) change of partners where the *Owner* is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c.B17 shall be included in the notification to the *District Manager*;
 - (d) change of name of the corporation where the *Owner* is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the *District Manager*;
- (2) In the event of any change in ownership of the *Works*, other than a change to a successor municipality, the *Owner* shall notify in writing the succeeding owner of the existence of this *Certificate*, and a copy of such notice shall be forwarded to the *District Manager* and the *Director*.

4. UPON THE SUBSTANTIAL COMPLETION OF THE WORKS

- (1) Upon the *Substantial Completion* of the *Works*, the *Owner* shall prepare a statement, certified by a Professional Engineer, that the works are constructed in accordance with this *Certificate*, and upon request, shall make the written statement available for inspection by *Ministry* personnel.
- (2) Within one (1) year of the *Substantial Completion* of the *Proposed Works*, a set of as-built drawings showing the works "as constructed" shall be prepared. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the *Works* for the operational life of the *Works*.

5. OPERATION AND MAINTENANCE

- (1) Within six (6) months of the commencement of operation of the *Works*, the *Owner* shall prepare a "Leachate Contingency and Remedial Action Plan" for the *Works* and submit the plan to the *District Manager* for approval.
- (2) The *Owner* shall inspect the *Works* and ensure that any sign of leachate seepage is identified, recorded, and appropriate remedial actions are undertaken in accordance with the "Leachate Contingency and Remedial Action Plan" prepared under Condition 5(1).
- (3) The *Owner* shall compare monitoring results obtained from the *Works* under Condition 6 with the trigger levels of the selected trigger parameters listed in Table 1 to identify any potential leachate impact to groundwater and the receiving surface water, Magnetawan River.

Table 1 - Trigger Parameters and Levels		
Effluent Parameter	Daily Concentration (milligrams per litre unless otherwise indicated)	
	Locations: BH03-1, BH03-2, BH07-1, and BH07-2	Location: S4
Ammonia (Unionized)	0.02	0.02
Iron	0.3	0.43
Boron	0.2	0.2
Copper	0.005	0.005
Total Phosphorus	0.03	0.03
Zinc	0.02	0.02

- (4) In the event that a monitoring result for any two (2) of the parameters listed in Table 1 exceeds their corresponding trigger levels for any one location, the *Owner* shall re-sample within one (1) month period to confirm the exceedence for those parameters at that location.
- (5) In the event that the trigger level exceedence for any of the parameters of concern is not confirmed after the second round of sampling conducted under Condition 5 (4), then, the *Owner* shall resume normal monitoring program.
- (6) In the event that the trigger level exceedence for any of parameters of concern is confirmed after the second round of sampling conducted under Condition 5 (4), the *Owner* shall implement the "Leachate Contingency and Remedial Action Plan" prepared under Condition 5 (1) and conduct monitoring for the trigger parameters listed under Condition 5 (3) at a **monthly frequency**.
- (7) After the implementation of the "Leachate Contingency and Remedial Action Plan", the *Owner* shall resume **normal** operation of the *Works* if monitoring results for all trigger parameters from three (3) consecutive sampling events conducted under Condition 5(6) are less than their respective trigger levels.
- (8) After three (3) years of operating the *Works* in accordance with Condition 5, the *Owner* may submit to the *District Manager* a request for changes to the list of trigger parameters and corresponding trigger levels stipulated under Condition 5 (3) along with supporting monitoring data and an assessment report and such changes shall be approved by the *District Manager* in writing from time to time;
- (9) The *Owner* shall prepare an operations manual within six (6) months of *Substantial Completion* of the *Proposed Works*, that includes, but not necessarily limited to, the following information:

- (a) operating procedures for routine operation of the *Works* ;
 - (b) inspection programs, including frequency of inspection, for the *Works* and the methods or tests employed to detect when maintenance is necessary;
 - (c) repair and maintenance programs, including the frequency of repair and maintenance for the *Works* ;
 - (d) procedures for the inspection and calibration of monitoring equipment;
 - (e) procedures for receiving, responding and recording public complaints, including recording any follow up actions taken.
- (10) The *Owner* shall maintain the operations manual current and retain a copy at the location of the *Works* or operational office of the *Owner* for the operational life of the *Works* . Upon request, the *Owner* shall make the manual available to *Ministry* staff.
- (11) The *Owner* shall provide for the overall operation of the *Works* with an operator who holds a licence that is applicable to that type of facility and that is of the same class as or higher than the class of the facility in accordance with Ontario Regulation 129/04.

6. MONITORING AND RECORDING

The *Owner* shall, upon commencement of operation of the *Works*, carry out the following monitoring program:

- (1) All samples and measurements taken for the purposes of this *Certificate* are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.
- (2) For the purposes of this condition, the following definitions apply:
 - (a) Monthly means once every month;
 - (b) Semi-annually means once every six months;
 - (c) Annually means once every twelve months; and
- (3) The *Owner* shall collect a grab sample of groundwater from the designated sampling locations at the monitoring frequency outlined and analyze for the parameters listed in Table 2.

Table 2 - Groundwater Monitoring		
Locations: BH03-1 and BHO3-2 at Frequency: Annually (September)		
Locations: BH07-1 and BH07-2 at Frequency: Semi- Annually (May and September)		
Parameter		Field Parameter
Alkalinity	Magnesium	pH
Bicarbonate Alkalinity	Nitrate	Conductivity
Carbonate Alkalinity	Nitrite	Turbidity
Total Ammonia	pH	Dissolved Oxygen
Barium	Total Phosphorus	Temperature
Boron	Sodium	
Calcium	Totals Dissolved Solids (TDS)	
Chloride	Sulphate	
Conductivity	COD	
Copper	Zinc	
Iron		

- (4) The *Owner* shall collect a grab sample of surface water from the designated sampling location at a monthly frequency during May, June, July, August, September, October and November and analyze for the parameters listed in Table 3.

Table 3 - Surface Water Monitoring		
Sampling Location: S4		
Parameter		Field Parameter
Alkalinity	Magnesium	pH
Bicarbonate Alkalinity	Manganese	Conductivity
Carbonate Alkalinity	Mercury	Turbidity
Total Ammonia	Nitrate	Dissolved Oxygen
Arsenic	Nitrite	Temperature
Barium	Total Kjeldahl Nitrogen (TKN)	
Boron	pH	VOC Parameter
Cadmium	Total Phosphorus	Benzene
Calcium	Potassium,	1,4-Dichlorobenzene
Chloride	Sodium	Dichloromethane
Chromium	Totals Dissolved Solids (TDS)	Toluene
Conductivity	Sulphate	Vinyl Chloride
Copper	COD	
Iron	DOC	
Lead	Phenol	
Zinc		

- (5) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:
- (a) the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;
 - (b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;
 - (c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions;
- (6) The measurement frequencies specified in subsection (2) in respect to any parameter are minimum requirements which may, after two (2) years of monitoring in accordance with this Condition, be modified by the *District Manager* in writing from time to time.
- (7) The *Owner* shall retain for a minimum of three (3) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this *Certificate*.

7. REPORTING

- (1) One week prior to the start up of the operation of the *Proposed Works*, the *Owner* shall notify the *District Manager* (in writing) of the pending start up date.
- (2) The *Owner* shall report to the *District Manager* or designate, any exceedence of trigger levels as stipulated under Condition 5 (6) orally, as soon as reasonably possible, and in writing within seven (7) days of the exceedence.
- (3) In addition to the obligations under Part X of the Environmental Protection Act, the *Owner* shall, within ten (10) working days of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the *District Manager* describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.
- (4) The *Owner* shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to *Ministry* staff.
- (5) The *Owner* shall prepare and submit to the *District Manager* an annual performance report by April the 30th. The first such report shall cover the first annual period following the

commencement of operation of the *Works* and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

- (a) a summary and interpretation of all monitoring data and a comparison to the trigger parameters outlined in Condition 5, including an overview of the success and adequacy of the *Works*;
- (b) a description of any operating problems encountered and corrective actions taken;
- (c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the *Works*;
- (d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;
- (e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment; and
- (f) any other information the *District Manager* requires from time to time.

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

1. Condition 1 is imposed to ensure that the *Works* are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Certificate and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this *Certificate* the existence of this *Certificate*.
2. Condition 2 is included to ensure that the *Works* are constructed in a timely manner so that standards applicable at the time of Approval of the *Works* are still applicable at the time of construction, to ensure the ongoing protection of the environment.
3. Condition 3 is included to ensure that the *Ministry* records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the *Works* are made aware of the *Certificate* and continue to operate the *Works* in compliance with it.
4. Condition 4 is included to ensure that the *Works* are constructed in accordance with the approval and that record drawings of the *Works* "as constructed" are maintained for future references.

5. Condition 5 is included to require that the *Works* be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the owner and made available to the *Ministry*. Such a manual is an integral part of the operation of the *Works*. Its compilation and use should assist the *Owner* in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for *Ministry* staff when reviewing the *Owner's* operation of the work.

Condition 6 is included to enable the *Owner* to evaluate and demonstrate the performance of the *Works*, on a continual basis, so that the *Works* are properly operated and maintained at a level which is consistent with the design objectives specified in the *Certificate* and that the *Works* does not cause any impairment to the receiving watercourse.

Condition 7 is included to provide a performance record for future references, to ensure that the *Ministry* is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this *Certificate*, so that the *Ministry* can work with the *Owner* in resolving any problems in a timely manner.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, 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 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, 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 works are located;

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

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario

AND

The Director
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A

M5G 1E5

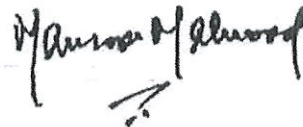
Toronto, Ontario
M4V 1L5

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 sewage works are approved under Section 53 of the Ontario Water Resources Act.

DATED AT TORONTO this 20th day of August, 2010

THE CERTIFICATE WAS MAILED	
ON	Aug 23, 2010
	<i>JP</i>
	(Signed)



Mansoor Mahmood, P.Eng.
Director
Section 53, Ontario Water Resources Act

SH/

:: District Manager, MOE North Bay
Jason T. Balsdon, Genivar Consultants LP ✓

Appendix B

Geologic Details

- Borehole Log Explanation Form
 - Borehole Logs
-



Terraprobe

PROJECT NAME: Tri R Landfill
 CLIENT: The Township of Armour
 LOCATION: Burks Falls

LOG OF BOREHOLE ..1..

PROJECT No.: 01503
 BORING DATE: February 7, 2001
 ELEVATION DATUM:

Solid Stem DEPTH SCALE IN METRES	SOIL PROFILE		SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION	
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WATER CONTENT (%)			
							20	40	60	80	10	20		30
0	GROUND SURFACE													
	TOPSOIL / ASHES		0.0	1	SS	9	x							
	WOOD FRAGMENT (FILL)													
1	Brown Compact Moist SANDY SILT, some ashes		0.6	2	SS	25	x							
	(FILL)													
2				3	SS	36	x							
3	Brown Dense Moist SAND, fine, some silt		2.5	4	SS	36	x							
4				5	SS	41	x							
5	Grinding Refusal and Spoon Refusal on Probable Redrock		4.7	6	SS	50/0"								
6														
7														
8														
9														

Bentonite Seal

3.7 m

1. 50 mm dia Schedule 40 PVC monitoring well installed with 1.5 m length screen and steel protective casing.

2. Water level measured at 3.7 m depth.



Terraprobe

PROJECT NAME: Tri R Landfill

CLIENT: The Township of Armour

LOCATION: Burks Falls

LOG OF BOREHOLE ..2..

PROJECT No.: 01503

BORING DATE: February 7, 2001

ELEVATION DATUM:

Solid Stem DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WATER CONTENT (%)			
							20	40	60	80	10	20	30	
0	GROUND SURFACE													
0.0	Brown Loose Moist SANDY SILT, some wood inclusions, trace of plastic debris, ashes, wire (FILL)		0.0	1	SS	3	x							
1				2	SS	48		x						
2				3	SS	6	x							
3	Brown Very Dense Moist SANDY SILT,		2.9	5	SS	50		x						
4	Brown Compact Wet SAND, fine, trace silt		4.0	6	SS	18	x							
5				7	SS	40		x						
6.4	Spoon and Auger Refusal on Probable Bedrock		6.4											

Bentonite Seal

4.6

1. 50 mm dia Schedule 40 PVC monitoring well installed with 1.5 m length slotted screen and steel protected casing.

2. Water level measured at 4.6 m depth.



Terraprobe

PROJECT NAME: Tri R Landfill
 CLIENT: The Township of Armour
 LOCATION: Burks Falls

LOG OF BOREHOLE ..3..

PROJECT No.: 01503
 BORING DATE: February 7, 2001
 ELEVATION DATUM:

Solid Stem DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WATER CONTENT (%)			
							20	40	60	80	10	20	30	
0	GROUND SURFACE													
	Brown Loose Moist SANDY SILT, some plastic (FILL)		0.0	1	SS	11	x							
1	Brown Dense Moist SANDY SILT		0.6	2	SS	32		x						
	Brown Compact Moist to Wet		1.3	3	SS	30		x						
2	SAND, some silt			4	SS	16		x						
3	Brown Compact Wet SAND, fine to medium, trace silt		2.8	5	SS	24		x						
				6	SS	30		x						
4														
5														
6	Auger Refusal on Probable Bedrock		5.5											
7														
8														
9														

1. 50 mm dia schedule 40 is monitoring well installed with 1.5 m length screen and steel protective casing.
 2. Water level measured at 2.1 m depth.



Terraprobe

PROJECT NAME: Tri R Landfill

CLIENT: The Township of Armour

LOCATION: Burks Falls

LOG OF BOREHOLE ..4..

PROJECT No.: 01503

BORING DATE: February 7, 2001

ELEVATION DATUM:

Solid Stem DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80				
0	GROUND SURFACE													1. Tried an adjacent hole and achieved similar refusal at 7.9 m depth. 2. Borehole dry, no installation.
0.5	Brown Loose Moist SANDY SILT, with wood fragments, occasional glass, and plastic inclusions (FILL)		0.0	1	SS	16	x							
1.0				2	SS	12	x							
1.5				3	SS	11	x							
2.0				4	SS	5	x							
2.5				5	SS	3	x							
3.0				6	SS	20	x							
3.5				7	SS	40	x							
7.6	Grinding Auger Refusal on Probable Bedrock		7.6											

GEO1.DWG

BOREHOLE LOG EXPLANATION FORM

This explanatory section provides the background to assist in the use of the borehole logs. Each of the headings used on the borehole log, is briefly explained.

DEPTH

This column gives the depth of interpreted geologic contacts in metres below ground surface.

STRATIGRAPHIC DESCRIPTION

This column gives a description of the soil based on a tactile examination of the samples and/or laboratory test results. Each stratum is described according to the following classification and terminology.

<u>Soil Classification*</u>		<u>Terminology</u>	<u>Proportion</u>
Clay	<0.002 mm		
Silt	0.002 to 0.06 mm	"trace" (e.g. trace sand)	<10%
Sand	0.06 to 2 mm	"some" (e.g. some sand)	10% - 20%
Gravel	2 to 60 mm	adjective (e.g. sandy)	20% - 35%
Cobbles	60 to 200 mm	"and" (e.g. and sand)	35% - 50%
Boulders	>200 mm	noun (e.g. sand)	>50%

* Extension of MIT Classification system unless otherwise noted.

The use of the geologic term "till" implies that both disseminated coarser grained (sand, gravel, cobbles or boulders) particles and finer grained (silt and clay) particles may occur within the described matrix.

The compactness of cohesionless soils and the consistency of cohesive soils are defined by the following:

<u>COHESIONLESS SOIL</u>		<u>COHESIVE SOIL</u>	
Compactness	Standard Penetration Resistance "N", Blows / 0.3 m	Consistency	Standard Penetration Resistance "N", Blows / 0.3 m
Very Loose	0 to 4	Very Soft	0 to 2
Loose	4 to 10	Soft	2 to 4
Compact	10 to 30	Firm	4 to 8
Dense	30 to 50	Stiff	8 to 15
Very Dense	Over 50	Very Stiff	15 to 30
		Hard	Over 30

The moisture conditions of cohesionless and cohesive soils are defined as follows.

COHESIONLESS SOILS

Dry
Moist
Wet
Saturated

COHESIVE SOILS

DTPL - Drier Than Plastic Limit
APL - About Plastic Limit
WTPL - Wetter Than Plastic Limit
MWTP - Much Wetter Than Plastic Limit

STRATIGRAPHY

Symbols may be used to pictorially identify the interpreted stratigraphy of the soil and rock strata.

MONITOR DETAILS

This column shows the position and designation of standpipe and/or piezometer ground water monitors installed in the borehole. Also the water level may be shown for the date indicated.

	Standpipe		Geotextile Material / Liner		Granular Backfill
	Piezometer		Borehole Seal (Bentonite Grout)		Granular (Filter) Pack
	Screened Interval		Cement Seal		Native Soil Backfill / Cave / Slough
	Borehole Seal (Peltonite, Bentonite or Hole Plug)				

Where monitors are placed in separate boreholes, these are shown individually in the "Monitor Details" column. Otherwise, monitors are in the same borehole. For further data regarding seals, screens, etc., the reader is referred to the summary of monitor details table.

SAMPLE

These columns describe the sample type and number, the "N" value, the water content, the percentage recovery, and Rock Quality Designation (RQD), of each sample obtained from the borehole where applicable. The information is recorded at the approximate depth at which the sample was obtained. The legend for sample type is explained below.

SS = Split Spoon	GS = Grab Sample
ST = Thin Walled Shelby Tube	CS = Channel Sample
AS = Auger Flight Sample	WS = Wash Sample
CC = Continuous Core	RC = Rock Core

$$\% \text{ Recovery} = \frac{\text{Length of Core Recovered Per Run}}{\text{Total Length of Run}} \times 100$$

Where rock drilling was carried out, the term RQD (Rock Quality Designation) is used. The RQD is an indirect measure of the number of fractures and soundness of the rock mass. It is obtained from the rock cores by summing the length of core recovered, counting only those pieces of sound core that are 100 mm or more in length. The RQD value is expressed as a percentage and is the ratio of the summed core lengths to the total length of core run. The classification based on the RQD value is given below.

<u>ROD Classification</u>	<u>ROD (%)</u>
Very poor quality	< 25
Poor quality	25 - 50
Fair quality	50 - 75
Good quality	75 - 90
Excellent quality	90 - 100

TEST DATA

The central section of the log provides graphs which are used to plot selected field and laboratory test results at the depth at which they were carried out. The plotting scales are shown at the head of the column.

Dynamic Penetration Resistance - The number of blows required to advance a 51 mm diameter, 60° steel cone fitted to the end of 45 mm OD drill rods, 0.3 m into the subsoil. The cone is driven with a 63.5 kg hammer over a fall of 750 mm.

Standard Penetration Resistance - Standard Penetration Test (SPT) "N" Value - The number of blows required to advance a 51 mm diameter standard split-spoon sampler 300 mm into the subsoil, driven by means of a 63.5 kg hammer falling freely a distance of 750 mm. In cases where the split spoon does not penetrate 300 mm, the number of blows over the distance of actual penetration in millimetres is shown as $\frac{x\text{Blows}}{\text{mm}}$

Water Content - The ratio of the mass of water to the mass of oven-dry solids in the soil expressed as a percentage.

W_p - Plastic Limit of a fine-grained soil expressed as a percentage as determined from the Atterberg Limit Test.

W_L - Liquid Limit of a fine-grained soil expressed as a percentage as determined from the Atterberg Limit Test.

REMARKS

The last column describes pertinent drilling details, field observations and/or provides an indication of other field or laboratory tests that were performed.

BOREHOLE NO. BH03-1

PROJECT NAME: TRI-R COMMITTEE LANDFILL SITE

PROJECT NO.: 0-031526.09

CLIENT: TRI-R COMMITTEE

DATE: MAY 1, 2003

BOREHOLE TYPE: 108 mm I.D. HOLLOW STEM AUGER

GEOLOGIST: CJR

GROUND ELEVATION: 293.59 mASL

REVIEWER: JTB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CONE PENETRATION			WATER CONTENT %			REMARKS	
				TYPE	N VALUE	% WATER	% RECOVERY	ROD (%)	N VALUE			WATER CONTENT %				
									10	20	30	10	20	30		
0										SHEAR STRENGTH			W _p W _L			
0.1	TOPSOIL															
	SAND: LIGHT BROWN; SILTY FINE TO MEDIUM SAND, TRACE CLAY, VERY LOOSE TO COMPACT; MOIST BECOMING WET AT 1.2 m.			1SS	2		71									
0.5																
1.0																
				2SS	17		92									
1.4																
1.5	GRAVELLY SAND: LIGHT BROWN TO LIGHT GREY; GRAVELLY FINE TO MEDIUM SAND, SOME SILT BECOMING SILTY WITH DEPTH, TRACE COARSE SAND, TRACE CLAY; DENSE TO VERY DENSE; WET, SATURATED BELOW 2.7 m.															
				3SS	36		68									
2.0																
				4SS	54		25									
2.5																
				5SS	57		46									
3.0																
3.5																
				6SS	>50		42									
4.0																
4.5																
4.6	BOREHOLE TERMINATED AT 4.6 m ON ASSUMED BEDROCK.															
5.0																

PARTICLE SIZE ANALYSIS
SAMPLE 5SS:

GRAVEL - 34%
SAND - 46%
SILT AND CLAY - 20%

SPLIT SPOON AND AUGER
REFUSAL AT 4.6 m.

PARTICLE SIZE ANALYSIS
SAMPLE 5SS:

GRAVEL - 34%
SAND - 46%
SILT AND CLAY - 20%

SPLIT SPOON AND AUGER
REFUSAL AT 4.6 m.

BOREHOLE NO. BH03-2

PROJECT NAME: TRI-R COMMITTEE LANDFILL SITE

PROJECT NO.: 0-031526.09

CLIENT: TRI-R COMMITTEE

DATE: MAY 1, 2003

BOREHOLE TYPE: 108 mm I.D. HOLLOW STEM AUGER

GEOLOGIST: CJR

GROUND ELEVATION: 294.36 mASL

REVIEWER: JTB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CONE PENETRATION		WATER CONTENT %			REMARKS
				TYPE	N _v VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE		10 20 30			
									10 20 30	10 20 30	10 20 30	10 20 30		
0														
0.1	TOPSOIL													
	SILT; BROWN; SILT; LOOSE; DRY.			1SS	7		46							
0.5														
1.0				2SS	26		67							
1.1														
	SILTY SAND; LIGHT GREY, ORANGE STAINING; SILTY FINE TO MEDIUM SAND; TRACE GRAVEL; COMPACT TO VERY DENSE; MOIST BECOMING SATURATED AT 2.3 m.			3SS	38		58							
1.5														
2.0				4SS	>50		12							
2.5														
3.0														
3.2														
	BOREHOLE TERMINATED AT 3.2 m ON ASSUMED BEDROCK.													
3.5														
4.0														
4.5														
5.0														

PARTICLE SIZE ANALYSIS
SAMPLE 4SS:
GRAVEL - 5%
SAND - 67%
SILT AND CLAY - 27%

SPLIT SPOON AND AUGER
REFUSAL AT 3.2 m.

BOREHOLE NO. BH03-3

PROJECT NAME: TRI-R COMMITTEE LANDFILL SITE

PROJECT NO.: 0-031526.09

CLIENT: TRI-R COMMITTEE

DATE: MAY 1, 2003

BOREHOLE TYPE: 108 mm I.D. HOLLOW STEM AUGER

GEOLOGIST: CJR

GROUND ELEVATION: 326.23 mASL

REVIEWER: JTB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CONE PENETRATION			WATER CONTENT %			REMARKS	
				TYPE	N ^o VALUE	% WATER	% RECOVERY	ROD (%)	"N" VALUE			WATER CONTENT %				
									10	20	30	10	20	30		
0										SHEAR STRENGTH			W _p W _L			
0.2	TOPSOIL															
0.5	SILTY SAND; LIGHT GREY TO BROWN, ORANGE MOTTLED; SILTY FINE SAND; TRACE GRAVEL; VERY DENSE; MOIST.			1SS	5		29									
1.0				2SS	73		58			73						
1.5				3SS	>50		62			>50						
2.0				4SS	>50		58			>50						
2.5				5SS	>50		71			>50						
3.0																
3.5	BOREHOLE TERMINATED AT 3.5 m ON ASSUMED BEDROCK.															SPLIT SPOON AND AUGER REFUSAL AT 3.5 m ON ASSUMED BEDROCK.
4.0																
4.5																
5.0																

SPLIT SPOON AND AUGER
REFUSAL AT 3.5 m ON
ASSUMED BEDROCK.

BOREHOLE NO. BH07-1

PAGE 1 of 1

PROJECT NAME: TRI-R COMMITTEE LANDFILL

PROJECT NO.: 0-031526.09

CLIENT: TRI-R COMMITTEE

DATE COMPLETED: Oct 28, 2007

BOREHOLE TYPE: 82 mm HQ CORE

SUPERVISOR: BTC

GROUND ELEVATION: 293.6 mASL

REVIEWER: JTB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CONE PENETRATION		WATER CONTENT %			UTM CO-ORDINATES UTM Zone: 17 NAD: 83 Easting: 625756 Northing: 5052913	REMARKS	
				TYPE	N VALUE	% WATER	% RECOVERY	ROD (%)	"N" VALUE							
									10	20	30	10	20			30
0.0																
0.2	TOPSOIL: DARK BROWN TOPSOIL, ROOTLETS. SAND: BEIGE, SILTY FINE TO MEDIUM SAND, NUMEROUS ROOTS.															
1.0				SS1			4									
1.4	SAND: BLACK AND BROWN MEDIUM SAND, SOME GRAVEL, OCCASIONAL ROOTLETS AND COBBLES.															
2.0																
3.0				RC3			95									
3.5																
4.0	MIGMATITE: GREY AND BLACK WITH PINK, LAMINAE OR THIN BEDS, ABOUT 60 DEGREE INCLINED FROM HORIZONTAL, PHANERITIC, FRACTURES PERPENDICULAR AND PARALLEL TO CORE AXIS, SOME FRACTURES ORIENTED ALONG BEDDING, SOME WEATHERING ALONG FRACTURES, BROKEN TO VERY BROKEN.			RC4			81	42								
5.0																
6.0				RC5			100	24								
7.0																
8.0				RC6			103	26								
8.9																
8.9	BOREHOLE TERMINATED AT 8.9 m IN MIGMATITE.			RC7			98	75								
10.0																

JHL GEOLOGIC BW (METRIC) WITH UTM 0-03152608 BURKS FALLS.GPJ JAGGER HIMS BASIC.GDT 4/19/10

BOREHOLE NO. BH07-2

PAGE 1 of 1

PROJECT NAME: TRI-R COMMITTEE LANDFILL

PROJECT NO.: 0-031526.09

CLIENT: TRI-R COMMITTEE

DATE COMPLETED: Oct 30, 2007

BOREHOLE TYPE: 82 mm HQ CORE

SUPERVISOR: BTC

GROUND ELEVATION: 294.5 mASL

REVIEWER: JTB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CONE PENETRATION		WATER CONTENT %		REMARKS		
				TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE			WATER CONTENT %			
									10	20	30	10		20	30
0.0															
0.2	TOPSOIL: DARK BROWN TOPSOIL, ROOTLETS. SAND: BROWN AND BEIGE MOTTLED FINE TO MEDIUM SAND AND SILT, WET TO SATURATED, OCCASIONAL GOBBLES.			SS1	12		50								
1.0				SS2	64		88								
2.0															
2.5	MIGMATITE: GREY AND BLACK WITH PINK, LAMINAE OR THIN BEDS, LAMINAE ORIENTATION VARIABLE WITH SOME BANDS INCLINED 60 DEGREE FROM HORIZONTAL, PHANERITIC, THICK QUARTZO FELDSPATHIC INTRUSION AT 5.1 m, FRACTURES TYPICALLY PERPENDICULAR TO CORE AXIS WITH SOME INCLINED ALONG BEDDING, WEATHERING VISIBLE ON FRACTURES.			RC3			100								
3.0				RC4			100	98							
4.0															
5.0				RC5			100	97							
6.0															
7.0				RC6			103	77							
8.0															
8.9	BOREHOLE TERMINATED AT 8.9 m IN MIGMATITE.			RC7			98	92							
10.0															

JHL GEOLOGIC BWM (METRIC) WITH UTM 0-03152609 BURKS FALLS.GPJ JAGGER HIMIS BASIC.GDT 4/19/10

BOREHOLE NO. BH07-3

PAGE 1 of 1

PROJECT NAME: TRI-R COMMITTEE LANDFILL

PROJECT NO.: 0-031526.09

CLIENT: TRI-R COMMITTEE

DATE COMPLETED: Oct 30, 2007

BOREHOLE TYPE: 82 mm HQ CORE

SUPERVISOR: BTC

GROUND ELEVATION: 326.0 mASL

REVIEWER: JTB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CONE PENETRATION		WATER CONTENT %		UTM CO-ORDINATES UTM Zone: 17 NAD: 83 Easting: 625503 Northing: 5053105	REMARKS		
				TYPE	N VALUE	% WATER	% RECOVERY	ROD (%)	"N" VALUE		CONTENT %					
									10	20	30	10			20	30
									SHEAR STRENGTH		W _p				W _L	
0.0																
0.1	TOPSOIL: DARK BROWN TOPSOIL, ROOTLETS. SAND: BROWN FINE TO MEDIUM SAND, TRACE SILT.															
1.0				GS1												
2.0																
3.0																
3.4	MIGMATITE: BLACK AND GREY WITH PINK, LAMINAE AND THIN BEDS WITH SOME MASSIVE SECTIONS, APHANITIC TO PHANERITIC AT ABOUT 5.8 m, BROKEN TO BLOCKY, FRACTURES PERPENDICULAR TO CORE AXIS AND ALONG BEDDING, SOME WEATHERING IN FRACTURES.															
4.0				RC2			71	26								
5.0				RC3			104	62								
6.0																
7.0				RC4			98	35								
8.0				RC5			105	84								
8.9	BOREHOLE TERMINATED AT 8.9 m IN MIGMATITE.															
9.0																
10.0																

JHL GEOLOGIC BAW (METRIC) WITH UTM 0-03152609 BURKS FALLS.GPJ JAGGER HIMS BASIC.GDT 4/19/10

BOREHOLE NO. BH07-4

PAGE 1 of 1

PROJECT NAME: TRI-R COMMITTEE LANDFILL

PROJECT NO.: 0-031526.09

CLIENT: TRI-R COMMITTEE

DATE COMPLETED: Oct 31, 2007

BOREHOLE TYPE: 82 mm HQ CORE

SUPERVISOR: BTC

GROUND ELEVATION: 336.8 mASL

REVIEWER: JTB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CONE PENETRATION		WATER CONTENT %		UTM CO-ORDINATES UTM Zone: 17 NAD: 83 Easting: 625788 Northing: 5053433	REMARKS		
				TYPE	N VALUE	% WATER	% RECOVERY	ROD (%)	"N" VALUE			10 20 30				
									10	20	30	10			20	30
0.0	TOPSOIL: DARK BROWN TOPSOIL, ROOTLETS.			SS1	9		42									
0.2	SAND: BROWN SAND AND ROOTS.															
0.6	MIGMATITE: LIGHT GREY AND BLACK WITH SOME PINK AND WHITE, LAMINAE AND THIN BEDS TYPICALLY INCLINED AT 45 TO 60 DEGREES FROM HORIZONTAL, PHANERITIC, BROKEN, FRACTURES PERPENDICULAR TO CORE AXIS AND ALONG BEDDING, SOME WEATHERING IN FRACTURES.			SS2	50		8									
1.0																
2.0				RC4			98	83								
3.0																
4.0				RC5			98	58								
5.0																
6.0				RC6			105	92								
7.0																
7.5	BOREHOLE TERMINATED AT 7.5 m IN MIGMATITE.			RC7			103	68								
8.0																
9.0																
10.0																

JHL GEOLOGIC BAW (METRIC) WITH UTM 003152609 BURKS FALLS GPJ JAGGER HIMMS BASIC.GDT 4/19/10

BOREHOLE NO. BH10-1

PAGE 1 of 1

PROJECT NAME: TRI-R LANDFILL 2010 ANNUAL MONITORING REPORT

PROJECT NO.: 0-031526.20

CLIENT: TRI-R COMMITTEE

DATE COMPLETED: Aug 03, 2010

BOREHOLE TYPE: 82 mm HQ CORE

SUPERVISOR: JMM

GROUND ELEVATION: 307.0 mASL

REVIEWER: JTB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CONE PENETRATION		WATER CONTENT %			REMARKS	
				TYPE	N VALUE	% WATER	% RECOVERY	ROD (%)	"N" VALUE						
									10	20	30	10	20		30
0.0	SAND; BROWN, FINE TO COARSE SAND, SOME SILT, WET.			SS	6		83		●						
0.9	MIGMATITE; GREY AND BLACK, LAMINAE OR THIN BANDING, SOME FRACTURES, SOME WEATHERING ALONG FRACTURES, BROKEN.			SS	60		17								
				CC			50								
2.0				CC			82								
3.0				CC			85								
4.0															
4.6	BOREHOLE TERMINATED AT 4.6 m IN MIGMATITE.														
5.0															

GENIVAR GEOLOGIC B/W (M) WITH UTM 0-03152620 LOGS.GPJ JAGGER HIMS BASIC.GDT 2/4/11

GENIVAR

BOREHOLE NO. BH10-2

PAGE 1 of 1

PROJECT NAME: TRI-R LANDFILL 2010 ANNUAL MONITORING REPORT

PROJECT NO.: 0-031526.20

CLIENT: TRI-R COMMITTEE

DATE COMPLETED: Aug 04, 2010

BOREHOLE TYPE: 82 mm HQ CORE

SUPERVISOR: JMM

GROUND ELEVATION: 332.3 mASL

REVIEWER: JTB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CONE PENETRATION		WATER CONTENT %		REMARKS		
				TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE						
									10	20	30	10		20	30
									SHEAR STRENGTH		W _p W _L				
0.0															
0.1	TOPSOIL: BLACK-BROWN, ORGANICS, MOIST. SAND: BROWN, FINE TO COARSE SAND, TRACE GRAVEL, WET TO SATURATED.			SS	3		92								
1.0				SS	44		67								
1.4	MIGMATITE: GREY AND BLACK WITH PINK, LAMINAE OR THIN BANDING, SOME FRACTURES, SOME WEATHERING ALONG FRACTURES, BROKEN.			SS	50		33								
2.0				CC			92								
3.0															
4.0				CC			97								
4.7	BOREHOLE TERMINATED AT 4.7 m IN MIGMATITE.														
5.0															

GENIVAR GEOLOGIC B/W (M) WITH UTM 0-03152620 LOGS.GPJ JAGGER HIMS BASIC.GDT 2/4/11

GENIVAR

GENIVAR GEOLOGIC BW (M) WITH UTM 0-03152620 LOGS.GPJ JAGGER HIMS BASIC.GDT 2/4/11

GENIVAR

PROJECT NAME: TRI-R LANDFILL SITE

PROJECT NO.: 13-004-00

CLIENT: TOWNSHIP OF ARMOUR

DATE: JULY 13, 2015

BOREHOLE TYPE: 108 mm I.D. HOLLOW STEM AUGER AND HQ CORING

SUPERVISOR: JTB

GROUND ELEVATION: 323.58 m AD

REVIEWER: JTB

[illegible]

Appendix C

Hydrogeologic Details

- Monitoring Well Details Summary – Table C-1
 - Groundwater Elevations – Table C-2
 - Hydrographs – Figures C-1 to C-2
-

TABLE C-1
MONITORING WELL DETAILS SUMMARY
TRI-R COMMITTEE LANDFILL

Borehole No.	Monitor Type	Screen Dia (mm)	Ground Surface (m asl)	Monitor (T.O.P.) (m asl)	Screened Interval (m asl)	Filter Pack (m asl)	Seal (m asl)
BH1	S	51	320.63	321.50	315.93 - 317.43	315.93 - 318.03	318.03 - 318.83
BH2	S	51	319.06	320.10	313.56 - 315.06	313.56 - 316.66	316.66 - 318.26
BH3	S	51	319.80	320.40	313.68 - 315.18	313.68 - 317.68	317.68 - 318.18
BH4	-	-	-	-	-	-	-
BH03-1	S	51	292.79	293.63	289.02 - 291.97	289.02 - 292.14	292.14 - 292.75
BH03-2	S	51	293.53	294.29	290.33 - 292.44	290.33 - 292.88	292.88 - 293.56
BH03-3	S	51	325.43	326.07	321.96 - 324.45	321.96 - 324.78	324.78 - 325.46
BH07-1	P	51	292.83	293.67	284.12 - 287.17	283.92 - 287.63	287.63 - 292.83
BH07-2	P	51	293.72	294.50	285.00 - 288.05	284.80 - 288.52	288.52 - 293.72
BH07-3	S	51	325.23	326.03	316.51 - 319.43	316.31 - 320.23	320.23 - 325.23
BH07-4	S	51	226.07	336.48	328.80 - 331.85	328.60 - 332.37	332.37 - 336.07
BH07-5	S	51	336.16	336.92	324.26 - 327.36	328.76 - 334.06	334.06 - 336.16
BH10-1	S	51	307.12	307.78	302.67 - 305.72	302.52 - 306.12	306.12 - 307.12
BH10-2	S	51	331.54	332.25	326.97 - 330.02	326.82 - 330.33	330.33 - 331.54
BH15-1	S	51	337.03	337.59	323.01 - 326.06	323.01 - 326.82	326.82 - 337.03
BH15-2	S	51	323.58	324.40	317.79 - 320.84	317.79 - 321.60	321.60 - 323.58
BH15-3	S	51	317.22	317.99	312.83 - 315.87	312.83 - 316.31	316.31 - 317.99

NOTES:

- 1) S denotes standpipe, P denotes piezometer.
- 2) 'mm' denotes millimetres.
- 3) 'm asl' denotes metres above sea level based on Trans-Canada Pipeline Limited benchmark #119-120 having an elevation of 332.174 m asl.
- 4) Elevations adjusted in July 2012 based on updated geodetic survey.
- 5) '**' denotes depths estimated based on borehole logs.

TABLE C-2
GROUNDWATER ELEVATIONS
TRI-R COMMITTEE LANDFILL

Page 1 of 6

Monitoring Well Designation	Ground Surface (m asl)	Monitor (T.O.P.) (m asl)	GROUNDWATER ELEVATION (m asl)							
			07-Feb-01	01-May-03	02-May-03	23-Nov-04	18-May-05	03-May-06	30-May-07	29-Oct-07
BH1	320.63	321.50	317.78		318.48	317.65	318.55	318.86	318.37	317.74
BH2	319.06	320.10	315.50		316.44	315.86	316.25	316.52	316.28	315.97
BH3	319.18	320.40	318.25		318.74	317.98	318.48	318.75	318.44	318.34
BH03-1	292.79	293.63		292.92	292.71	289.96	292.26	291.96	292.12	291.63
BH03-2	293.53	294.29		291.48	291.47	<290.33	291.86	292.09	291.66	<290.33
BH03-3	325.43	326.07		<321.96	<321.96	<321.96	<321.96	<321.96	<321.96	<321.96
BH07-1	292.83	293.67								292.62
BH07-2	293.72	294.50								291.82
BH07-3	325.23	326.03								318.90
BH07-4	336.07	336.48								335.55
BH07-5	336.16	336.92								326.21
BH10-1	307.12	307.78								
BH10-2	331.54	332.25								
BH15-1	337.03	337.59								
BH15-2	323.58	324.40								
BH15-3	317.22	317.99								

NOTES:

- 1) 'm asl' denotes metres above sea level.
- 2) T.O.P. indicates top of monitoring well pipe.
- 3) October 29, 2007, data obtained between October 29 and November 2, 2007.
- 4) Groundwater elevations at dry boreholes are represented as being "less than" the bottom of well elevation.
- 5) Shading denotes water level at top of pipe, which suggests flowing conditions.
- 6) Elevations adjusted in July 2012 based on updated geodetic survey.

TABLE C-2
GROUNDWATER ELEVATIONS
TRI-R COMMITTEE LANDFILL

Page 2 of 6

Monitoring Well Designation	Ground Surface (m asl)	Monitor (T.O.P.) (m asl)	GROUNDWATER ELEVATION (m asl)							
			19-Jun-08	09-Jun-09	03-May-10	14-Sep-10	30-May-11	21-Sep-11	16-May-12	09-Sep-12
BH1	320.63	321.50			318.54	317.38	318.96	317.54	318.54	317.38
BH2	319.06	320.10			316.40	315.72	316.59	315.78	316.40	315.80
BH3	319.18	320.40			318.70	318.16	318.84	317.68	318.61	317.94
BH03-1	292.79	293.63	292.31	292.41	292.37	291.56	292.53	291.27	292.20	291.24
BH03-2	293.53	294.29	292.31	292.35	292.08	291.22	292.55	290.68	291.88	<290.33
BH03-3	325.43	326.07	<321.96	<321.96	<321.96	<321.96	<321.96	<321.96	<321.96	<321.96
BH07-1	292.83	293.67	293.67	293.67	293.67	293.12	293.67	293.16	293.46	293.01
BH07-2	293.72	294.50	293.23	293.28	293.20	292.75	293.30	292.27	293.02	292.25
BH07-3	325.23	326.03	320.61	320.81	320.22	318.18	321.31	318.15	320.56	318.70
BH07-4	336.07	336.48	335.18	335.03	335.12	334.04	335.27	333.54	335.07	333.71
BH07-5	336.16	336.92	327.98	326.90	325.68	324.34	326.95	324.41	325.69	324.37
BH10-1	307.12	307.78				306.12	306.58	306.05	306.59	305.98
BH10-2	331.54	332.25				330.03	331.27		331.22	330.74
BH15-1	337.03	337.59								
BH15-2	323.58	324.40								
BH15-3	317.22	317.99								

NOTES:

- 1) 'm asl' denotes metres above sea level.
- 2) T.O.P. indicates top of monitoring well pipe.
- 3) October 29, 2007, data obtained between October 29 and November 2, 2007.
- 4) Groundwater elevations at dry boreholes are represented as being "less than" the bottom of well elevation.
- 5) Shading denotes water level at top of pipe, which suggests flowing conditions.
- 6) Elevations adjusted in July 2012 based on updated geodetic survey.

TABLE C-2
GROUNDWATER ELEVATIONS
TRI-R COMMITTEE LANDFILL

Page 3 of 6

Monitoring Well Designation	Ground Surface (m asl)	Monitor (T.O.P.) (m asl)	GROUNDWATER ELEVATION (m asl)						
			15-May-13	11-Sep-13	21-May-14	10-Sep-14	06-May-15	14-Jul-15	23-Sep-15
BH1	320.63	321.50	318.91	317.63	319.15	318.31	Decommissioned		
BH2	319.06	320.10	316.61	315.91	316.71	316.30	316.52		315.63
BH3	319.18	320.40	318.90	318.05	318.95	318.41	318.83		317.61
BH03-1	292.79	293.63	292.43	291.55	292.60	291.81	292.63		291.22
BH03-2	293.53	294.29	292.46	291.28	292.60	291.73	292.55		<291.12
BH03-3	325.43	326.07	<321.96	<321.96	<321.96	<321.96	322.15		<321.96
BH07-1	292.83	293.67	293.67	293.41	293.67	293.67	293.67		293.32
BH07-2	293.72	294.50	293.14	292.73	293.27	292.91	293.22		292.08
BH07-3	325.23	326.03	320.93	319.08	321.42	319.59	321.07		318.12
BH07-4	336.07	336.48	335.22	334.23	335.36	334.81	335.26		333.69
BH07-5	336.16	336.92	326.06	324.44	328.08	324.47	325.62		324.45
BH10-1	307.12	307.78	306.67	306.41	306.72	306.62	306.77		306.40
BH10-2	331.54	332.25	331.27	330.97	331.31	331.14	331.30		330.04
BH15-1	337.03	337.59						324.94	324.11
BH15-2	323.58	324.40						320.97	318.77
BH15-3	317.22	317.99						314.18	314.90

NOTES:

- 1) 'm asl' denotes metres above sea level.
- 2) T.O.P. indicates top of monitoring well pipe.
- 3) October 29, 2007, data obtained between October 29 and November 2, 2007.
- 4) Groundwater elevations at dry boreholes are represented as being "less than" the bottom of well elevation.
- 5) Shading denotes water level at top of pipe, which suggests flowing conditions.
- 6) Elevations adjusted in July 2012 based on updated geodetic survey.

TABLE C-2
GROUNDWATER ELEVATIONS
TRI-R COMMITTEE LANDFILL

Page 4 of 6

Monitoring Well Designation	Ground Surface (m asl)	Monitor (T.O.P.) (m asl)	GROUNDWATER ELEVATION (m asl)						
			18-May-16	14-Sep-16	24-May-17	19-Sep-17	22-May-18	19-Sep-18	15-May-19
BH1	320.63	321.50	Decommissioned						
BH2	319.06	320.10	316.55	315.85	316.60	316.45	316.62	316.69	316.84
BH3	319.18	320.40	318.79	318.02	318.86	318.68	318.82	318.83	318.93
BH03-1	292.79	293.63	292.50	291.34	292.29	292.21	292.49	292.02	292.70
BH03-2	293.53	294.29	292.43	<291.12	292.34	292.20	292.60	291.65	292.64
BH03-3	325.43	326.07	<321.96	<321.96	<321.96	<321.96	<321.96	<321.96	322.06
BH07-1	292.83	293.67	293.67	293.33	293.67	293.67	293.67	293.67	293.67
BH07-2	293.72	294.50	293.19	292.41	293.13	293.07	293.23	292.93	293.28
BH07-3	325.23	326.03	320.98	319.93	321.04	320.55	320.96	319.95	321.30
BH07-4	336.07	336.48	335.32	334.00	335.28	335.15	335.32	334.99	335.42
BH07-5	336.16	336.92	326.15	324.45	327.04	326.01	325.76	325.34	328.27
BH10-1	307.12	307.78	306.82	306.51	306.86	306.81	306.88	306.74	306.88
BH10-2	331.54	332.25	331.29	330.68	331.31	331.29	331.31	331.12	331.23
BH15-1	337.03	337.59	325.40	324.18	325.54	325.54	325.45	324.77	325.82
BH15-2	323.58	324.40	321.73	319.21	321.45	321.00	321.63	320.93	321.65
BH15-3	317.22	317.99	316.84	315.28	316.56	316.43	316.64	315.52	316.73

NOTES:

- 1) 'm asl' denotes metres above sea level.
- 2) T.O.P. indicates top of monitoring well pipe.
- 3) October 29, 2007, data obtained between October 29 and November 2, 2007.
- 4) Groundwater elevations at dry boreholes are represented as being "less than" the bottom of well elevation.
- 5) Shading denotes water level at top of pipe, which suggests flowing conditions.
- 6) Elevations adjusted in July 2012 based on updated geodetic survey.

TABLE C-2
GROUNDWATER ELEVATIONS
TRI-R COMMITTEE LANDFILL

Page 5 of 6

Monitoring Well Designation	Ground Surface (m asl)	Monitor (T.O.P.) (m asl)	GROUNDWATER ELEVATION (m asl)						
			17-Sep-19	13-May-20	10-Sep-20	13-May-21	21-Sep-21	05-May-22	15-Sep-22
BH1	320.63	321.50	Decommissioned						
BH2	319.06	320.10	315.87	316.59	316.71	316.70	316.27	316.78	315.94
BH3	319.18	320.40	317.94	318.69	318.82	318.75	318.38	318.90	318.00
BH03-1	292.79	293.63	291.19	292.03	292.48	292.22	291.42	292.51	291.13
BH03-2	293.53	294.29	<291.05	292.09	292.17	292.27	291.43	292.21	<291.05
BH03-3	325.43	326.07	<321.96	<321.96	<321.96	<321.96	<321.96	322.19	<321.84
BH07-1	292.83	293.67	293.49	293.67	293.67	293.67	293.53	293.67	293.48
BH07-2	293.72	294.50	292.24	293.02	293.11	293.04	292.57	293.19	292.15
BH07-3	325.23	326.03	318.96	323.70	320.26	320.61	319.42	321.18	318.43
BH07-4	336.07	336.48	333.86	335.19	335.34	335.24	334.47	335.34	333.91
BH07-5	336.16	336.92	324.50	326.22	325.79	326.14	324.49	328.24	324.52
BH10-1	307.12	307.78	306.74	306.84	306.83	306.85	306.81	306.88	306.75
BH10-2	331.54	332.25	330.71	331.27	331.35	331.33	330.88	331.35	330.37
BH15-1	337.03	337.59	324.13	326.57	325.09	325.46	324.64	325.55	324.22
BH15-2	323.58	324.40	318.73	319.19	321.12	321.44	319.82	321.91	318.95
BH15-3	317.22	317.99	315.06	316.58	315.98	316.46	315.23	316.79	315.13

NOTES:

- 1) 'm asl' denotes metres above sea level.
- 2) T.O.P. indicates top of monitoring well pipe.
- 3) October 29, 2007, data obtained between October 29 and November 2, 2007.
- 4) Groundwater elevations at dry boreholes are represented as being "less than" the bottom of well elevation.
- 5) Shading denotes water level at top of pipe, which suggests flowing conditions.
- 6) Elevations adjusted in July 2012 based on updated geodetic survey.

TABLE C-2
GROUNDWATER ELEVATIONS
TRI-R COMMITTEE LANDFILL

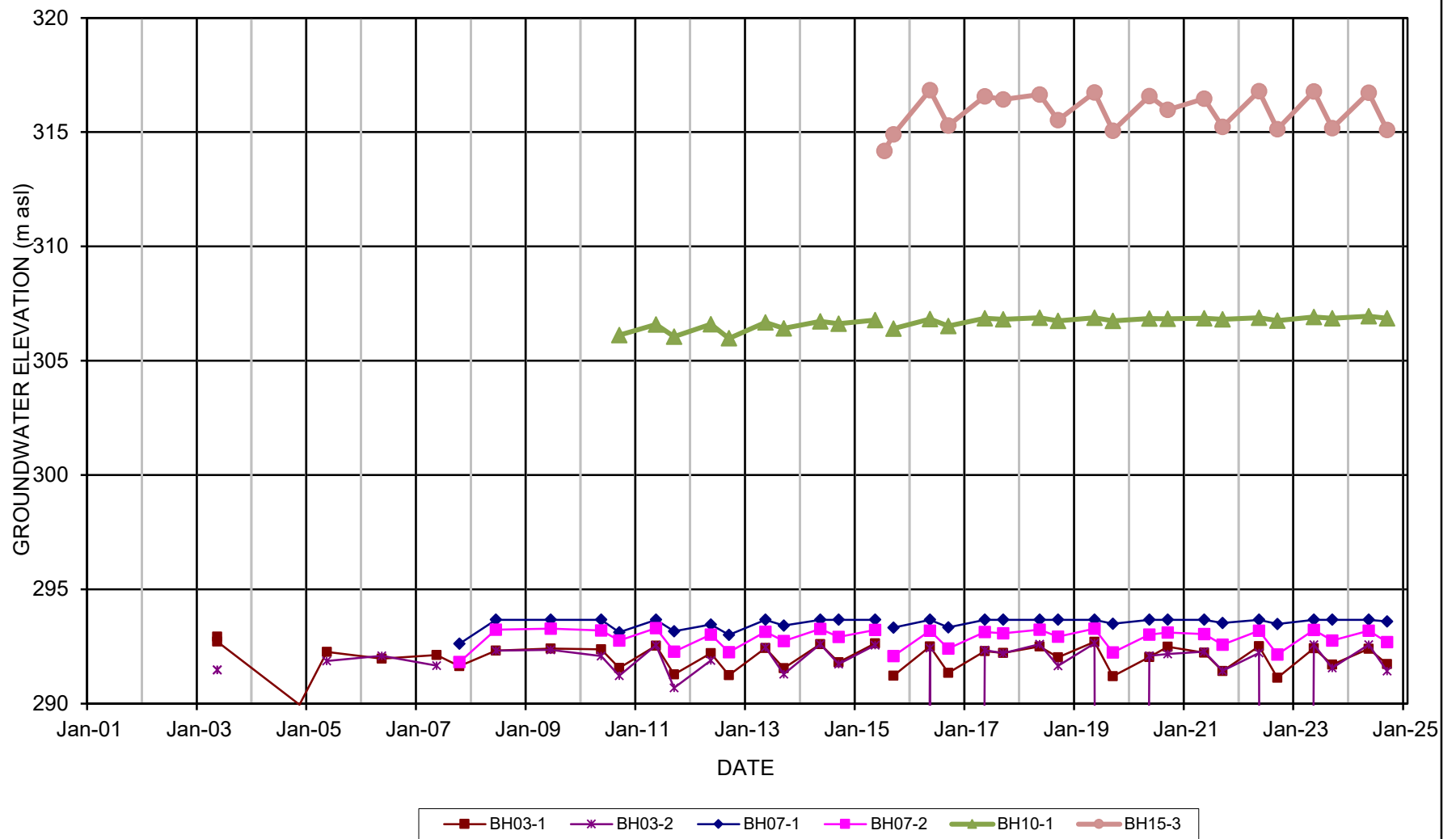
Page 6 of 6

Monitoring Well Designation	Ground Surface (m asl)	Monitor (T.O.P.) (m asl)	GROUNDWATER ELEVATION (m asl)						
			10-May-23	20-Sep-23	01-May-24	30-Sep-24			
BH1	320.63	321.50	Decommissioned						
BH2	319.06	320.10	316.83	316.34	316.83	316.36			
BH3	319.18	320.40	318.95	318.38	318.87	318.35			
BH03-1	292.79	293.63	292.42	291.70	292.39	291.73			
BH03-2	293.53	294.29	292.57	291.56	292.57	291.42			
BH03-3	325.43	326.07	322.20	<321.84	321.93	<321.84			
BH07-1	292.83	293.67	293.67	293.67	293.67	293.59			
BH07-2	293.72	294.50	293.22	292.76	293.19	292.69			
BH07-3	325.23	326.03	321.36	319.35	321.31	319.40			
BH07-4	336.07	336.48	335.32	334.54	335.43	334.48			
BH07-5	336.16	336.92	328.78	324.64	328.37	324.49			
BH10-1	307.12	307.78	306.91	306.85	306.95	306.85			
BH10-2	331.54	332.25	331.35	330.94	331.38	330.91			
BH15-1	337.03	337.59	325.61	324.49	325.65	324.39			
BH15-2	323.58	324.40	321.70	319.75	322.19	319.79			
BH15-3	317.22	317.99	316.78	315.17	316.72	315.09			

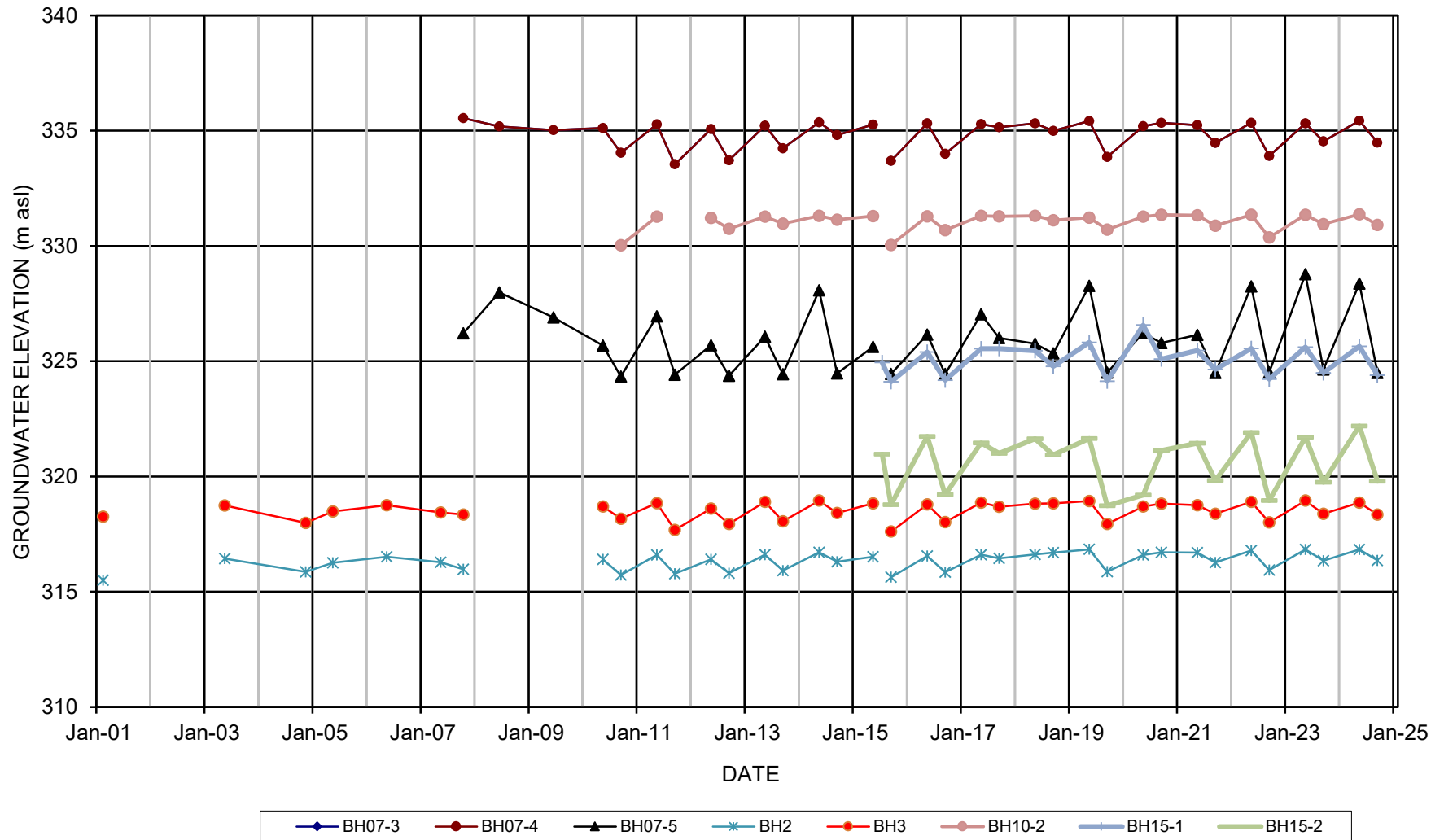
NOTES:

- 1) 'm asl' denotes metres above sea level.
- 2) T.O.P. indicates top of monitoring well pipe.
- 3) October 29, 2007, data obtained between October 29 and November 2, 2007.
- 4) Groundwater elevations at dry boreholes are represented as being "less than" the bottom of well elevation.
- 5) Shading denotes water level at top of pipe, which suggests flowing conditions.
- 6) Elevations adjusted in July 2012 based on updated geodetic survey.

**FIGURE C-1
GROUNDWATER HYDROGRAPHS
TRI-R COMMITTEE LANDFILL**



**FIGURE C-2
GROUNDWATER HYDROGRAPHS
TRI-R COMMITTEE LANDFILL**



Appendix D

Leachate Chemical Results

- General Chemical Results – Leachate – Table D-1
 - Time-Concentration Graphs – Figures D-1 to D-4
-

TABLE D-1
GENERAL CHEMICAL RESULTS - LEACHATE
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	ODWSOG	BH07-5	BH07-5	BH07-5	BH07-5	BH07-5	BH07-5	BH15-1	BH15-1	BH15-1	BH15-1	BH15-1	BH15-1	BH15-1	BH15-1
SAMPLING DATE			02-Nov-07	19-Jun-08	09-Jun-09	14-Sep-10	12-Sep-12	11-Sep-13	23-Sep-15	18-May-16	14-Sep-16	24-May-17	19-Sep-17	19-Sep-18	17-Sep-19	10-Sep-20
pH	pH units	6.5 to 8.5***	7.10	8.00	7.2	7.5		7.61	7.2	7.76	8.17	7.51	7.65	7.5	7.01	7.08
Conductivity	µS/cm	no criterion	412	1360	1490	1400		1070	1470	994	1080	1640	1360	935	1480	982
Alkalinity (as CaCO ₃)	mg/L	30-500**	43	501	501	486		428	636	324	406	766	611	358	621	474
Bicarbonate Alkalinity (as CaCO ₃)	mg/L	no criterion				485		428	636	324	406	766	611	358	621	474
Carbonate Alkalinity (as CaCO ₃)	mg/L	no criterion				1		<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L	80-100***	150	730	760	630										
Chloride	mg/L	250**	7	6	9	11		17	46.7	37.1	33.3	62.2	55.3	35.4	45.4	32.6
Sulphate	mg/L	500**	129	261	350	290		237	1.34	126	90.7	37.6	8.45	24.2	19.5	4.32
Calcium	mg/L	no criterion	46	220	220	170		154	98	10.5	10.2	96.1	69.1	65.7	102	59
Magnesium	mg/L	no criterion	10	45	49	50		47.1	31.3	2.39	1.64	29.6	23.6	18.6	29.8	17.1
Potassium	mg/L	no criterion	10	54	61	65			54.5	2.29	2.05	58	47.2	31.4	40.1	28.5
Sodium	mg/L	20/200**	17	12	14	15		14.8	47.7	194	224	62.5	50.6	32.8	42.4	21.8
Iron	mg/L	0.3**	1.70	<0.100	<0.1	0.39	4.48		95	0.511	3.7	78.7	63.3	47	85.1	42.5
Manganese	mg/L	0.05**	0.53	0.55	1.4				3.19	0.121	0.185	2.34	2.01	1.47	2.94	1.62
Ammonia (total)	mg/L	no criterion	0.13	<0.05	0.33	0.14	0.60		52.1	0.18	0.23	64.7	45.7	12.2	34	42
Total Kjeldahl Nitrogen	mg/L	no criterion							60.6	1.91	1.2	71.3	49.2	21.8	29.5	39.8
Nitrite	mg/L	1*	0.01	0.02	0.12				<0.25	<0.25	<0.25	<0.50	<0.50	<0.50	<0.50	<0.25
Nitrate	mg/L	10*	0.20	2.60	2.1	1.2			<0.25	1.66	0.55	<0.50	<0.50	<0.50	<0.50	<0.25
DOC	mg/L	5*	12	24	27.9	26.2			50.1	38.8	50.1	24	42.2	32.2	39.5	25.6
COD	mg/L	no criterion				83			688	71	97	225	155	112	147	97
Phenols	mg/L	no criterion							0.016	0.007	<0.001	0.01	0.002	0.021		0.005
Boron	mg/L	5*	0.130	0.840	0.96	0.98	1.09		0.874	0.187	0.271	0.833	0.675	0.479	0.661	0.37
Phosphate	mg/L	no criterion	<0.01	<0.01	<0.01											
Aluminum	mg/L	0.10***	0.047	0.094	0.088											
Barium	mg/L	1*	0.028	0.046	0.039	0.038	0.047		0.182	0.044	0.063	0.143	0.124	0.082	0.119	0.083
Beryllium	mg/L	no criterion	<0.0005	<0.0005	<0.0005											
Cadmium	mg/L	0.005*	0.0002	0.0001	<0.0001				<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	mg/L	0.05*	<0.005	<0.005	<0.005				0.008	<0.003	0.004	0.006	0.003	0.004	0.004	0.004
Cobalt	mg/L	no criterion	0.014	0.002	0.0013											
Copper	mg/L	1*	0.004	0.015	0.011				<0.003	0.024	0.063	<0.003	<0.003	<0.003	<0.003	<0.003
Lead	mg/L	0.01*	<0.0005	<0.005	<0.0005				<0.002	<0.002	0.005	<0.002	<0.002	<0.001	<0.001	0.002
Molybdenum	mg/L	no criterion	0.003	<0.001	0.002											
Nickel	mg/L	no criterion	0.018	<0.001	<0.001											
Phosphorus (total)	mg/L	no criterion	<0.1	<0.1	<0.1				16.5	4.6	2.96	7.75	4.08	2.63	0.59	0.26
Silver	mg/L	no criterion	<0.0001	<0.0001	<0.0001											
Vanadium	mg/L	no criterion	<0.001	0.0010	<0.001											
Zinc	mg/L	5**	0.066	0.044	<0.005				0.009	0.007	0.016	<0.005	<0.005	<0.005	<0.005	0.038
Total Dissolved Solids	mg/L	500**	254	913	1020	900	952		700	1000	2050	680	548	392	594	512
Selenium	mg/L	no criterion	<0.002	<0.002	<0.002											
Antimony	mg/L	0.006*	<0.0005	<0.0005	<0.0005											
Mercury	mg/L	0.001							<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.025*	<0.001	<0.0001	<0.0001				0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Solids	mg/L					38						9030	3940	3550	1200	352
BOD	mg/L					<2										

NOTES:

- 1) Blank indicates data not available.
- 2) uS/cm denotes microsiemen per centimetre.
- 3) mg/L denotes microgram per litre.
- 4) ODWSOG indicates Ontario Drinking Water Standards Objectives and Guidelines (2006).
- 5) * indicates health related ODWSOG.
- 6) ** indicates aesthetic objective for ODWSOG.
- 7) *** indicates operational guideline for ODWSOG.
- 8) Shading indicates parameter concentration exceeds or does not meet ODWSOG.

TABLE D-1
GENERAL CHEMICAL RESULTS - LEACHATE
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	ODWSOG	BH15-1	BH15-1	BH15-1	BH15-1
SAMPLING DATE			21-Sep-21	15-Sep-22	20-Sep-23	30-Sep-24
pH	pH units	6.5 to 8.5***	7.09	6.7	6.82	6.73
Conductivity	µS/cm	no criterion	1830	1500	1640	2170
Alkalinity (as CaCO ₃)	mg/L	30-500**	820	609	779	931
Bicarbonate Alkalinity (as CaCO ₃)	mg/L	no criterion	820	609	779	931
Carbonate Alkalinity (as CaCO ₃)	mg/L	no criterion	<5	<5	<5	<5
Hardness	mg/L	80-100***				
Chloride	mg/L	250**	76.4	60.8	64.2	80
Sulphate	mg/L	500**	5.49	18.2	3.99	10.5
Calcium	mg/L	no criterion	112	151	117	114
Magnesium	mg/L	no criterion	36	84.7	30.6	34.7
Potassium	mg/L	no criterion	82.2	85.6	59.1	77.4
Sodium	mg/L	20/200**	99.7	63.5	69.7	96
Iron	mg/L	0.3**	95.9	402	80	56.6
Manganese	mg/L	0.05**	3.32	6.31	2.4	2.14
Ammonia (total)	mg/L	no criterion	85	56.1	65.2	91.4
Total Kjeldahl Nitrogen	mg/L	no criterion	85	70.5	76.2	103
Nitrite	mg/L	1*	0.96	<0.05	<0.05	<0.11
Nitrate	mg/L	10*	<0.07	<0.05	<0.05	<0.14
DOC	mg/L	5*	72.5	43.7	41.8	51.4
COD	mg/L	no criterion	146	145	199	223
Phenols	mg/L	no criterion	0.055	0.019	0.02	0.003
Boron	mg/L	5*	1.53	1.01	0.962	1.38
Phosphate	mg/L	no criterion				
Aluminum	mg/L	0.10***				
Barium	mg/L	1*	0.162	1.24	0.128	0.126
Beryllium	mg/L	no criterion				
Cadmium	mg/L	0.005*	<0.002	0.0011	<0.002	<0.002
Chromium	mg/L	0.05*	0.005	0.421	0.004	<0.006
Cobalt	mg/L	no criterion				
Copper	mg/L	1*	<0.003	0.261	<0.003	0.007
Lead	mg/L	0.01*	<0.001	0.109	<0.001	<0.002
Molybdenum	mg/L	no criterion				
Nickel	mg/L	no criterion				
Phosphorus (total)	mg/L	no criterion	0.41	5.8	0.5	0.25
Silver	mg/L	no criterion				
Vanadium	mg/L	no criterion				
Zinc	mg/L	5**	<0.005	1.04	<0.005	0.056
Total Dissolved Solids	mg/L	500**	674	546	696	860
Selenium	mg/L	no criterion				
Antimony	mg/L	0.006*				
Mercury	mg/L	0.001	<0.0001	0.0005	<0.0001	<0.0001
Arsenic	mg/L	0.025*	<0.003	0.048	<0.003	<0.006
Total Solids	mg/L		262	264	263	212
BOD	mg/L					

NOTES:

- 1) Blank indicates data not available.
- 2) uS/cm denotes microsiemen per centimetre.
- 3) mg/L denotes microgram per litre.
- 4) ODWSOG indicates Ontario Drinking Water Standards Objectives and
- 5) * indicates health related ODWSOG.
- 6) ** indicates aesthetic objective for ODWSOG.
- 7) *** indicates operational guideline for ODWSOG.
- 8) Shading indicates parameter concentration exceeds or does not meet

FIGURE D-1
TIME CONCENTRATION GRAPH - Chloride

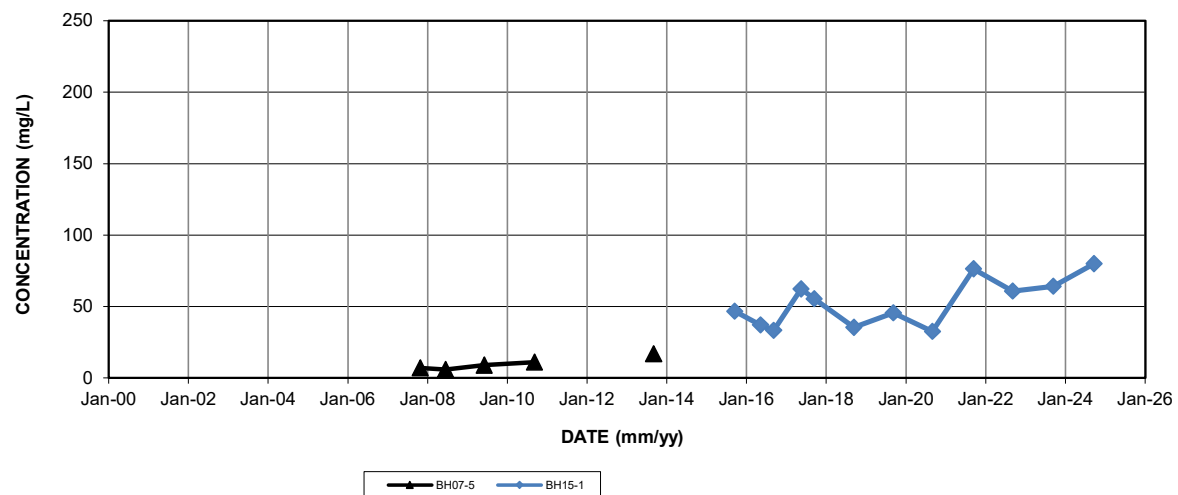


FIGURE D-2
TIME CONCENTRATION GRAPH - Iron

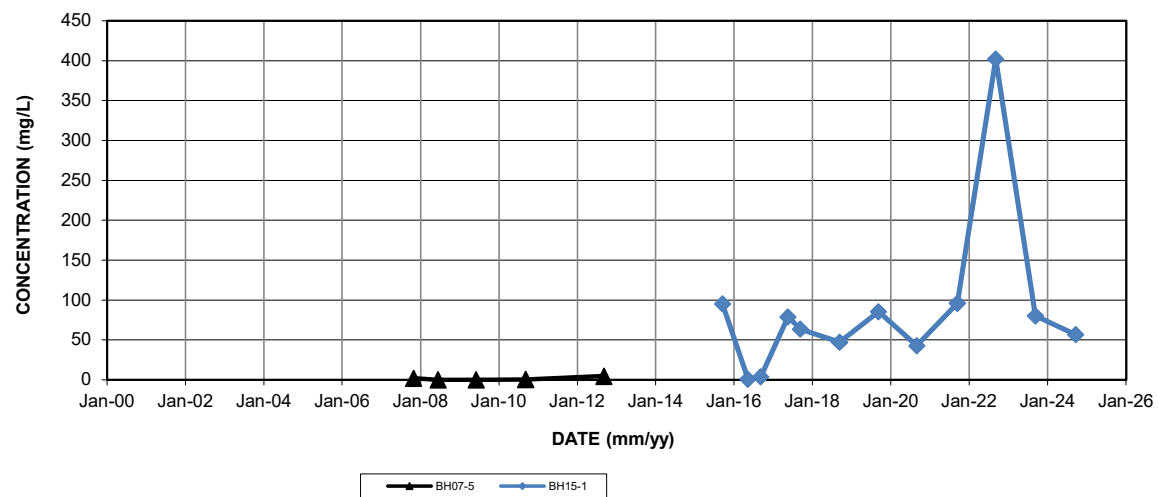


FIGURE D-3
TIME CONCENTRATION GRAPH - Total Ammonia

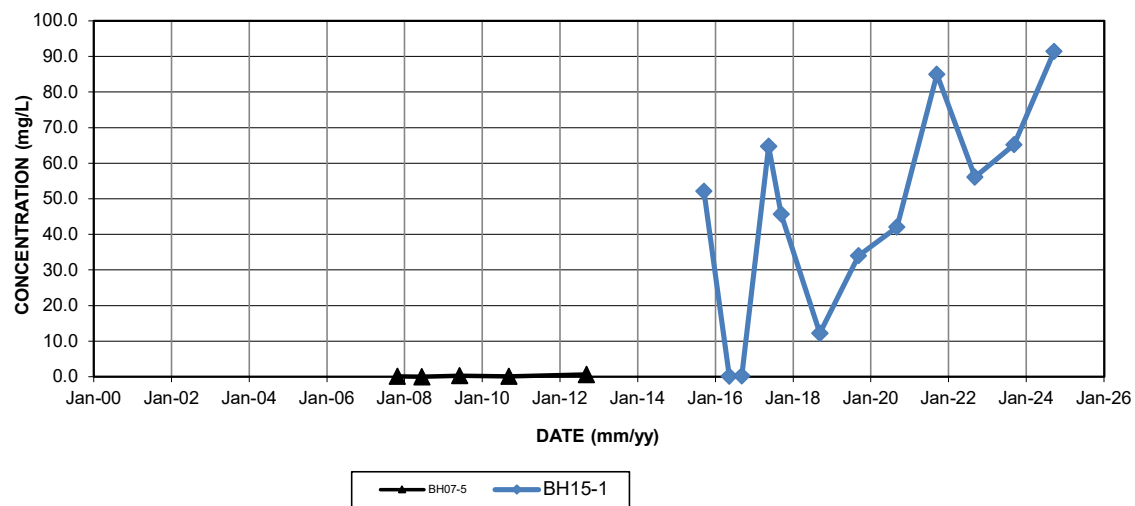
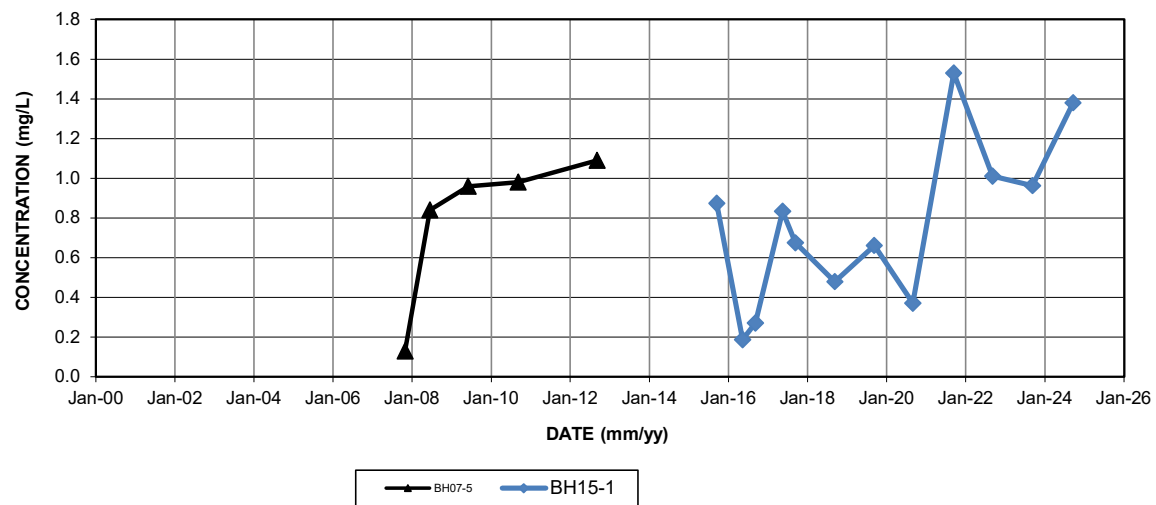


FIGURE D-4
TIME CONCENTRATION GRAPH - Boron



Appendix E

Groundwater Chemical Results

- Field Chemical Results – Groundwater – Table E-1
 - General Chemical Results – Groundwater – Table E-2
 - Time-Concentration Graphs – Figures E-1 to E-8
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TABLE E-1
FIELD CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	BH03-1		BH03-2		BH07-1		BH07-2		BH03-3
	DATE	01-May-24	30-Sep-24	01-May-24	30-Sep-24	01-May-24	30-Sep-24	01-May-24	30-Sep-24	01-May-24
Temperature	C°	6.2		6.3		6.7	8.8	6.9	9.1	
pH	pH units	5.75		6.3		7.62	7.65	6.75	6.1	
Conductivity	uS/cm	31	IS	32	IS	442	388	187	196	IS
Turbidity	NTU	>200		>200		12.3	100	9.13	17.5	
Dissolved Oxygen	mg/L	5.2		8.0		3.4	3.5	4.1	4.0	

PARAMETER	UNITS	BH07-3	BH10-1	BH10-2	BH2	BH3	BH15-2	BH15-3
	DATE	01-May-24	01-May-24	01-May-24	01-May-24	01-May-24	01-May-24	01-May-24
Temperature	C°	7.5	5.8	7.3	10.0	7.1	6.3	5.9
pH	pH units	6.45	5.96	6.31	6.26	6.53	5.42	6.58
Conductivity	uS/cm	205	359	199	1142	1453	35	379
Turbidity	NTU	21.7	66.8	>200	>200	>200	31.5	>200
Dissolved Oxygen	mg/L	7.8	4.4	4.0	3.0	3.2	3.4	3.4

NOTES:

- 1) C denotes Celsius.
- 2) uS/cm denotes microsiemens per centimetre.
- 3) NTU denotes nephelometric units.
- 4) mg/L indicates milligrams per litre.
- 5) IS indicates insufficient sample.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1
DATE		20-May-03	23-Nov-04	18-May-05	03-May-06	30-May-07	02-Nov-07	19-Jun-08	09-Jun-09	03-May-10	14-Sep-10
pH	6.5 to 8.5***	6.18	7.25	6.40	6.50	6.00	5.90	6.4	6.00	6.20	6.0
Conductivity	no criterion	122	82	50	46	41	50	42	43	37	59
Alkalinity (as CaCO ₃)	30-500**	21	<1	7	6	6	4	7	7	6	4
Bicarbonate Alkalinity (as CaCO ₃)	no criterion									6	4
Carbonate Alkalinity (as CaCO ₃)	no criterion									<1	<1
Hardness	80-100***	31	10	14	14	12	13	13	11	12	18
Chloride	250**	2	6	<1.0	2	1	1	1	5	1	9
Sulphate	500**	29	15	<1.0	14	11	15	11	9	8	7
Calcium	no criterion	9	3	4	4	3	4	3.6	3.1	3.2	5.1
Magnesium	no criterion	2	1	1	1	1	1	1.1	0.83	0.88	1.3
Potassium	no criterion	2.00	0.70	0.20	0.22	<0.2	0.370	<0.2	<0.2		
Sodium	20/200**	8.10	4.60	2.60	3.30	2.60	3.30	2.6	2.0	2.4	3.5
Iron	0.3**	0.05	0.19	<0.05	<0.05	<0.05	<0.1	<0.100	<0.1	<0.1	<0.1
Manganese	0.05**	0.197	0.064	0.008	0.012	0.009	0.068	0.11	0.019		
Ammonia (total)	no criterion	0.28	0.50	0.12	0.06	0.12	0.09	<0.05	<0.05	<0.05	0.05
Total Kjeldahl Nitrogen	no criterion										
Nitrite	1*		<0.2	<0.2	<0.1	<0.01	<0.01	<0.01	<0.01		0.01
Nitrate	10*	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
DOC	5*	3.90	2.80	15.40	10.90	15.00	19.00	4.5	2		
COD	no criterion										
Phenols	no criterion										
Boron	5*		<0.005	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.010	<0.01
Phosphate	no criterion		<0.3	<0.3	0.0200	<0.01	<0.01	<0.01	<0.01		
Aluminum	0.10***		0.1860	0.0820	0.0850	0.0900	0.059	0.099	0.087		
Barium	1*		0.0220	0.0140	0.0160	0.0150	0.017	0.018	0.017	0.015	0.03
Beryllium	no criterion		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		
Bismuth	no criterion		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Cadmium	0.005*		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002		
Chromium	0.05*		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
Cobalt	no criterion		0.0004	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		
Copper	1*	<0.005	0.0012	0.0040	0.0050	0.0020	<0.001	0.004	0.002		0.001
Lead	0.01*		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		
Molybdenum	no criterion		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Nickel	no criterion		0.0040	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Phosphorus (total)	no criterion		<0.05	<0.05	<0.05	<0.05	<0.1	<100	<0.1		18
Silver	no criterion		<0.0001	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	0.0009		
Strontium	no criterion		0.0320	0.0350	0.0350	0.0330	0.0370	0.038	0.038		
Titanium	no criterion		0.0080	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
Vanadium	no criterion		<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Zinc	5**	0.0160	0.0060	0.0120	0.0110	0.0080	<0.005	0.006	<0.005		0.009
Total Dissolved Solids	500**	80	44	12	29	36	45	38	37	34	48
Selenium	no criterion		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		
Antimony	0.006*		<0.0005	<0.001	<0.001	0.0005	<0.0005	<0.0005	0.0006		
Mercury	0.001										
Arsenic	0.025*		<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		

NOTES:

- 1) Blank indicates data not available.
- 2) ODWSOG indicates Ontario Drinking Water Standards Objectives and Guidelines (2006).
- 3) * indicates health related ODWSOG.
- 4) ** indicates aesthetic objective for ODWSOG.
- 5) *** indicates operational guideline for ODWSOG.
- 6) Shading indicates parameter concentration exceeds or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1
DATE		30-May-11	16-May-12	15-May-13	11-Sep-13	21-May-14	10-Sep-14	06-May-15	18-May-16	24-May-17	19-Sep-17	22-May-18	19-Sep-18
pH	6.5 to 8.5***	6.46	6.04	6.07	6.07	6.41	6.32	6.33	5.98	6.68	6.42	5.99	6.42
Conductivity	no criterion	38	40	44	47	34	36	28	34	32	36	28	30
Alkalinity (as CaCO ₃)	30-500**	5	5	6	9	5	6	<5	5	6	9	7	7
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	5	5	6	9	5	6	<5	5	6	9	7	7
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***		76										
Chloride	250**	0.98	1.21	1.09	1.98	0.96	0.75	1	1	1.1	0.94	1.32	1.13
Sulphate	500**	9.6	8.96	7.67	9.29	5.93	6.08	3.97	7.65	6.78	4.96	4.12	2.91
Calcium	no criterion	3.06	3.25	2.96	3.36	2.41	3	1.45	2.09	2.07	2.52	2.1	2.34
Magnesium	no criterion	0.83	0.92	0.86	0.91	0.99	0.84	0.37	0.73	0.61	0.68	1.07	0.72
Potassium	no criterion						0.14			0.1	<0.10	0.52	0.21
Sodium	20/200**	2.47	2.69	2.7	2.84	2.26	2.5	2.09	2.15	2.09	1.83	2.03	2.2
Iron	0.3**	<0.010	0.033	0.014	<0.010	<0.010	0.027	<0.010	<0.010	<0.010	0.012	<0.010	0.08
Manganese	0.05**						0.024				0.058		0.237
Ammonia (total)	no criterion	<0.02	<0.02	<0.02	<0.02	0.03	0.06	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion						0.27				0.38		1.85
Nitrite	1*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05		<0.05
Nitrate	10*	<0.05	0.23	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	0.07	0.06	<0.05	0.05
DOC	5*	4	15.3	2.8	5.2	2.9	4.2	3.3	2.9		5.1		3.8
COD	no criterion	<5	11	12	9	13	24	17	7		31		5
Phenols	no criterion						<0.001				<0.001		<0.001
Boron	5*	<0.010	<0.010	<0.010	0.014	0.015	<0.010	0.013	<0.010	<0.010	0.016	0.011	<0.010
Phosphate	no criterion												
Aluminum	0.10***												
Barium	1*	0.015	0.017	0.014	0.02	0.026	0.018	0.009	0.011	0.015	0.017	0.011	0.018
Beryllium	no criterion												
Bismuth	no criterion												
Cadmium	0.005*						<0.001				<0.001		<0.001
Chromium	0.05*						<0.003				<0.003		<0.003
Cobalt	no criterion												
Copper	1*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003		<0.003		<0.003
Lead	0.01*						<0.002				<0.002		<0.001
Molybdenum	no criterion												
Nickel	no criterion												
Phosphorus (total)	no criterion	<0.05	3.28	0.99	0.55	1.79	2.1	1.34	0.58		2.64		1.44
Silver	no criterion												
Strontium	no criterion												
Titanium	no criterion												
Vanadium	no criterion												
Zinc	5**	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.006	0.008
Total Dissolved Solids	500**	38		44	54	42	68	38	40	34	44	34	34
Selenium	no criterion												
Antimony	0.006*												
Mercury	0.001						<0.0001				<0.0001		<0.0001
Arsenic	0.025*						<0.003				<0.003		<0.003

NOTES:

- 1) Blank indicates data not available.
- 2) ODWSOG indicates Ontario Drinking Water Standards Objectives and Guidelines (2006).
- 3) * indicates health related ODWSOG.
- 4) ** indicates aesthetic objective for ODWSOG.
- 5) *** indicates operational guideline for ODWSOG.
- 6) Shading indicates parameter concentration exceeds or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1	BH03-1
DATE		15-May-19	13-May-20	10-Sep-20	13-May-21	21-Sep-21	5-May-22	10-May-23	20-Sep-23	1-May-24	30-Sep-24
pH	6.5 to 8.5***	6.24	6.08	6.01	5.98	6.31	6.59	6.03	5.62	6.19	5.75
Conductivity	no criterion	29	31	33	30	35	35	34	39	33	34
Alkalinity (as CaCO ₃)	30-500**	8	6	12	8	24	22	8	10	10	9
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	8	6	12	8	24	22	8	10	10	9
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***										
Chloride	250**	1.14	1.24	1.36	1.7	1.39	1.55	1.54	1.7	1.37	2.67
Sulphate	500**	3.54	5.29	3.56	4.02	4.82	3.05	4.41	4.78	3.84	5.75
Calcium	no criterion	1.84	2	3.68	2.08	2.48	1.87	2.13	2.7	1.4	2.34
Magnesium	no criterion	0.49	0.58	1.25	0.62	0.71	0.56	0.62	0.67	0.5	0.74
Potassium	no criterion	0.08	<0.05	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sodium	20/200**	1.91	1.91	2.23	2.15	2.41	1.99	2.46	2.75	1.71	2.68
Iron	0.3**	<0.010	<0.010	1.69	0.029	<0.010	0.014	0.025	0.031	<0.020	0.021
Manganese	0.05**			0.208		0.026			0.009		0.009
Ammonia (total)	no criterion	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion			0.19		9.39			0.39		<0.10
Nitrite	1*			<0.05		<0.05			<0.05		<0.05
Nitrate	10*	<0.05	<0.05	<0.05	0.06	0.12	<0.05	<0.05	<0.05	<0.05	0.12
DOC	5*			3.2		35.4			2.1		2
COD	no criterion			<5		27			7		15
Phenols	no criterion			<0.001					0.002		<0.001
Boron	5*	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.03	<0.010
Phosphate	no criterion										
Aluminum	0.10***										
Barium	1*	0.01	0.012	0.065	0.012	0.02	0.01	0.009	0.016	0.013	0.017
Beryllium	no criterion										
Bismuth	no criterion										
Cadmium	0.005*			<0.001		<0.001			<0.001		<0.001
Chromium	0.05*			<0.003		<0.003			<0.003		<0.003
Cobalt	no criterion										
Copper	1*			0.003		0.004			<0.003		<0.003
Lead	0.01*			0.001		<0.001			<0.001		<0.001
Molybdenum	no criterion										
Nickel	no criterion										
Phosphorus (total)	no criterion			0.22		<0.02			0.91		0.3
Silver	no criterion										
Strontium	no criterion										
Titanium	no criterion										
Vanadium	no criterion										
Zinc	5**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005
Total Dissolved Solids	500**	<20	30	22	34	32	10	<10	16	26	20
Selenium	no criterion										
Antimony	0.006*										
Mercury	0.001			<0.0001		<0.0001			<0.0001		<0.0001
Arsenic	0.025*			<0.003		<0.003			<0.003		<0.003

NOTES:

- 1) Blank indicates data not available.
- 2) ODWSOG indicates Ontario Drinking Water Standards Objectives and Guidelines (2006).
- 3) * indicates health related ODWSOG.
- 4) ** indicates aesthetic objective for ODWSOG.
- 5) *** indicates operational guideline for ODWSOG.
- 6) Shading indicates parameter concentration exceeds or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2
DATE		20-May-03	18-May-05	03-May-06	30-May-07	19-Jun-08	09-Jun-09	14-Sep-10	11-Sep-13	21-May-14	10-Sep-14
pH	6.5 to 8.5***	5.91	6.80	6.30	6.40	6.50	6.00	6.2	5.63	6.54	6.23
Conductivity	no criterion	69	60	61	67	61	58	61	54	52	61
Alkalinity (as CaCO ₃)	30-500**	4	7	9	13	8	8	5	<5	7	9
Bicarbonate Alkalinity (as CaCO ₃)	no criterion							5	<5	7	9
Carbonate Alkalinity (as CaCO ₃)	no criterion							<1	<5	<5	<5
Hardness	80-100***	21.9	19	20	20	17	18	18			
Chloride	250**	2.2	7.8	3	2	2	1	<1	1.6	1.01	1.28
Sulphate	500**	19	<1.0	16	16	16	14	16	14.5	9.82	15
Calcium	no criterion	6	5	6	6	4.8	5.1	4.9	4.38	3.7	5.52
Magnesium	no criterion	1.44	1.37	1.40	1.50	1.1	1.3	1.3	1.07	0.97	1.6
Potassium	no criterion	<1	<0.2	0.30	0.55	<0.2	<0.2				0.47
Sodium	20/200**	3.20	2.80	3.20	3.30	2.8	3.0		3.32	2.6	3.56
Iron	0.3**	0.25	<0.05	<0.05	<0.050	<0.100	<0.1	<0.1		<0.010	<0.010
Manganese	0.05**	0.030	0.004	0.004	0.005	0.004	0.004				0.003
Ammonia (total)	no criterion	0.26	0.08	0.05	0.17	<0.05	<0.05	<0.05	<0.02	0.04	0.03
Total Kjeldahl Nitrogen	no criterion										<0.10
Nitrite	1*		<0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05
Nitrate	10*	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.06	<0.05	<0.05
DOC	5*	3.40	3.90	2.50	4.50	2.5	1.5		3.7	2.1	1.9
COD	no criterion								9	7	<5
Phenols	no criterion										<0.001
Boron	5*		<0.005	<0.01	<0.010	<10	<0.01	<0.01		0.01	<0.010
Phosphate	no criterion		<0.3	<0.01	<0.01	<0.01	<0.01				
Aluminum	0.10***		0.0230	0.0260	0.0260	0.029	0.027				
Barium	1*		0.0090	0.0100	0.0150	0.012	0.012	0.013		0.007	0.013
Beryllium	no criterion		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				
Bismuth	no criterion		<0.001	<0.001	<0.001	<0.001	<0.001				
Cadmium	0.005*		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				<0.001
Chromium	0.05*		<0.005	<0.005	<0.005	<0.005	<0.005				<0.003
Cobalt	no criterion		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				
Copper	1*	<0.005	<0.001	0.0220	0.0030	0.004	0.003	0.001		<0.003	<0.003
Lead	0.01*		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				<0.002
Molybdenum	no criterion		<0.001	<0.001	<0.001	<0.001	<0.001				
Nickel	no criterion		<0.001	<0.001	<0.001	<0.001	<0.001				
Phosphorus (total)	no criterion		<0.05	<0.05	<0.05	<100	<0.1	5.9	1.97	5.47	0.32
Silver	no criterion		<0.0005	<0.0001	<0.0001	<0.0001	<0.0001				
Strontium	no criterion		0.0470	0.0490	0.0520	0.052	0.051				
Titanium	no criterion		<0.005	<0.005	<0.005	<0.005	<0.005				
Vanadium	no criterion		<0.001	<0.001	<0.001	<0.001	<0.001				
Zinc	5**	0.0340	<0.005	0.0140	0.0170	0.005	<0.005	0.006		<0.005	<0.005
Total Dissolved Solids	500**	51	22	35	55	50	48	50	78	106	60
Selenium	no criterion		<0.002	<0.002	<0.002	<0.002	<0.002				
Antimony	0.006*		<0.001	<0.001	<0.0005	<0.0005	<0.0005				
Mercury	0.001										<0.0001
Arsenic	0.025*		<0.001	<0.001	<0.001	<0.001	<0.001				<0.003

NOTES:

- 1) Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
 - 3) * indicates health related ODWSOG.
 - 4) ** indicates aesthetic objective for ODWSOG.
 - 5) *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2	BH03-2
DATE		06-May-15	18-May-16	24-May-17	19-Sep-17	22-May-18	19-Sep-18	15-May-19	13-May-20	10-Sep-20	13-May-21	5-May-22	10-May-23
pH	6.5 to 8.5***	6.44	5.95	6.73	6.84	6.01	6.55	6.23	6.52	6.01	6.27	6.4	5.98
Conductivity	no criterion	44	42	40	49	40	47	35	34	40	38	38	35
Alkalinity (as CaCO ₃)	30-500**	7	5	8	12	9	8	6	<5	12	11	12	6
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	7	5	8	12	9	8	6	<5	12	11	12	6
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***												
Chloride	250**	0.84	1.35	0.84	0.55	0.89	0.84	0.86	0.92	0.86	0.92	0.87	1.1
Sulphate	500**	9.33	10.7	8.94	8.72	8.07	9.4	6.78	6.71	7.2	6.92	5.03	5.37
Calcium	no criterion	3.29	3.11	3.15	3.52	3.37	3.94	2.85	2.8	5.63	3.1	2.54	2.84
Magnesium	no criterion	0.87	1.53	0.88	0.93	0.85	1.04	0.68	0.7	1.76	0.81	0.6	0.78
Potassium	no criterion			0.27	0.17	0.14	0.22	0.16	0.1	0.42	<0.50	<0.50	<0.50
Sodium	20/200**	2.38	2.64	2.33	2.57	2.34	3.16	1.94	1.82	2.71	2.14	1.82	2.49
Iron	0.3**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	1.84	0.025	<0.010	0.039
Manganese	0.05**				0.003		0.003			0.073			
Ammonia (total)	no criterion	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion				0.26		0.25			0.14			
Nitrite	1*	<0.05	<0.05		<0.05		<0.05			<0.05			
Nitrate	10*	0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DOC	5*	2.5	2.8		2.2		2.8			1.8			
COD	no criterion	6	<5		<5		<5			<5			
Phenols	no criterion				<0.001		<0.001			<0.001			
Boron	5*	<0.010	<0.010	0.014	0.012	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate	no criterion												
Aluminum	0.10***												
Barium	1*	0.007	0.008	0.009	0.009	0.009	0.015	0.008	0.008	0.073	0.006	0.006	0.006
Beryllium	no criterion												
Bismuth	no criterion												
Cadmium	0.005*				<0.001		<0.001			<0.001			
Chromium	0.05*				<0.003		<0.003			<0.003			
Cobalt	no criterion												
Copper	1*	<0.003	<0.003		<0.003		<0.003			0.005			
Lead	0.01*				<0.002		<0.001			<0.001			
Molybdenum	no criterion												
Nickel	no criterion												
Phosphorus (total)	no criterion	2.23	2.1		0.58		0.28			1.07			
Silver	no criterion												
Strontium	no criterion												
Titanium	no criterion												
Vanadium	no criterion												
Zinc	5**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005
Total Dissolved Solids	500**	94	84	40	46	52	54	<20	34	26	42	26	44
Selenium	no criterion												
Antimony	0.006*												
Mercury	0.001				<0.0001		<0.0001			<0.0001			
Arsenic	0.025*				<0.003		<0.003			<0.003			

NOTES:

- 1) Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
 - 3) * indicates health related ODWSOG.
 - 4) ** indicates aesthetic objective for ODWSOG.
 - 5) *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH03-2	BH03-2	BH03-2
DATE		20-Sep-23	1-May-24	30-Sep-24
pH	6.5 to 8.5***	5.67	6.21	6.01
Conductivity	no criterion	48	33	44
Alkalinity (as CaCO ₃)	30-500**	9	9	10
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	9	9	10
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5
Hardness	80-100***			
Chloride	250**	1.42	0.85	1.61
Sulphate	500**	8.36	5.14	7.67
Calcium	no criterion	3.97	1.88	3.53
Magnesium	no criterion	0.94	0.55	1
Potassium	no criterion	<0.50	<0.50	0.59
Sodium	20/200**	2.82	2.16	3.45
Iron	0.3**	0.014	0.027	0.055
Manganese	0.05**	0.003		0.007
Ammonia (total)	no criterion	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion	0.28		<0.10
Nitrite	1*	<0.05		<0.05
Nitrate	10*	0.08	<0.05	<0.05
DOC	5*	1.6		2.9
COD	no criterion	8		7
Phenols	no criterion	0.002		<0.001
Boron	5*	<0.010	0.022	0.011
Phosphate	no criterion			
Aluminum	0.10***			
Barium	1*	0.009	0.006	0.011
Beryllium	no criterion			
Bismuth	no criterion			
Cadmium	0.005*	<0.001		<0.001
Chromium	0.05*	<0.003		<0.003
Cobalt	no criterion			
Copper	1*	<0.003		<0.003
Lead	0.01*	<0.001		<0.001
Molybdenum	no criterion			
Nickel	no criterion			
Phosphorus (total)	no criterion	1.46		0.67
Silver	no criterion			
Strontium	no criterion			
Titanium	no criterion			
Vanadium	no criterion			
Zinc	5**	<0.005	<0.005	<0.005
Total Dissolved Solids	500**	48	30	30
Selenium	no criterion			
Antimony	0.006*			
Mercury	0.001	<0.0001		<0.0001
Arsenic	0.025*	<0.003		<0.003

NOTES:

- 1) Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
 - 3) * indicates health related ODWSOG.
 - 4) ** indicates aesthetic objective for ODWSOG.
 - 5) *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1
DATE		02-Nov-07	19-Jun-08	09-Jun-09	03-May-10	14-Sep-10	30-May-11	21-Sep-11	16-May-12	18-Jul-12	12-Sep-12
pH	6.5 to 8.5***	8.10	8.0	7.3	7.9	7.9	8.08	7.98	7.67	7.94	7.8
Conductivity	no criterion	244	251	261	285	296	272	266	310	277	286
Alkalinity (as CaCO ₃)	30-500**	73	77	86	90	89	89	93	98	96	94
Bicarbonate Alkalinity (as CaCO ₃)	no criterion				89	89	89	93	98	96	94
Carbonate Alkalinity (as CaCO ₃)	no criterion	<1	<1	<1	<1	<1	<5	<5	<5	<5	<5
Hardness	80-100***	120	110	100	120	130					
Chloride	250**	20	19	21	23	24	25.6	24.3	23.2	24.8	26.8
Sulphate	500**	18	19	17	19	18	19.4	20	17.4	18.1	22.1
Calcium	no criterion	37	33	32	37	40	39.2	39.2	39.8	38.1	41.1
Magnesium	no criterion	6.00	5.8	5.2	6.7	6.7	6.5	6.29	6.54	6.36	6.74
Potassium	no criterion	4.7	2.7	2.5							
Sodium	20/200**	11	6.5	5.8	6.7		6.31	6.46	6.46	6.55	6.53
Iron	0.3**	<0.100	<0.100	<0.1	<0.1	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010
Manganese	0.05**	0.021	0.008	0.008							
Ammonia (total)	no criterion	<0.05	0.06	<0.05	<0.05	<0.05	<0.02	0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion										
Nitrite	1*	<0.01	0.02	<0.01		<0.01	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	10*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
DOC	5*	1.50	0.8	0.7			1.2	2.2	1.3	1.3	1.3
COD	no criterion						<5	<5	<5	<5	<5
Phenols	no criterion										
Boron	5*	0.018	0.016	0.016	0.18	0.019	0.018	0.027	0.018	0.018	0.019
Phosphate	no criterion	<0.01	<0.01	0.01							
Aluminum	0.10***	0.0130	<0.005	<0.005							
Barium	1*	0.1400	0.17	0.19	0.19	0.22	0.218	0.211	0.207	0.229	0.218
Beryllium	no criterion	<0.0005	<0.0005	<0.0005							
Bismuth	no criterion	<0.001	<0.001	<0.001							
Cadmium	0.005*	<0.0001	<0.0001	0.0001							
Chromium	0.05*	<0.005	<0.005	<0.005							
Cobalt	no criterion	<0.0005	<0.0005	<0.0005							
Copper	1*	0.0020	0.003	0.002		<0.001	<0.003	<0.003	<0.003	<0.003	<0.003
Lead	0.01*	<0.0005	<0.0005	<0.0005							
Molybdenum	no criterion	0.002	<0.001	<0.001							
Nickel	no criterion	<0.001	<0.001	<0.001							
Phosphorus (total)	no criterion	<0.1	<100	<0.1		<0.02	<0.05	0.08	0.08	0.08	0.08
Silver	no criterion	<0.0001	<0.0001	0.0006							
Strontium	no criterion	0.630	0.66	0.71							
Titanium	no criterion	<0.005	<0.005	<0.005							
Vanadium	no criterion	0.003	0.002	<0.001							
Zinc	5**	0.015	0.007	<0.005		<0.005	0.008	<0.005	0.058	0.025	<0.005
Total Dissolved Solids	500**	154	145	147	162	165	180	158	182	174	186
Selenium	no criterion	<0.002	<0.002	<0.002							
Antimony	0.006*	<0.0005	<0.0005	<0.0005							
Mercury	0.001										
Arsenic	0.025*	<0.001	<0.001	<0.001							

NOTES:

- Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
 - * indicates health related ODWSOG.
 - ** indicates aesthetic objective for ODWSOG.
 - *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH7-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1
DATE		15-May-13	11-Sep-13	21-May-14	10-Sep-14	06-May-15	23-Sep-15	18-May-16	14-Sep-16	24-May-17	19-Sep-17	22-May-18	19-Sep-18
pH	6.5 to 8.5***	7.79	7.38	8.03	7.99	8.09	8.24	7.83	8.21	8.26	8.22	7.51	8.03
Conductivity	no criterion	321	289	327	344	359	378	394	388	370	396	389	412
Alkalinity (as CaCO ₃)	30-500**	96	105	104	107	116	118	133	131	134	137	155	130
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	96	105	104	107	116	118	133	131	134	137	155	130
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***												
Chloride	250**	28.9	25.7	26.4	28.4	27.1	28.6	30.8	26.5	26.1	28.7	30.1	30.3
Sulphate	500**	22.6	18.4	19	20.6	19.9	22.1	25.3	21.2	21.7	22.1	23.9	22.8
Calcium	no criterion	44.1	42.6	45.2	48.1	49.1	48.6	48.8	49.8	47.9	50.4	56.2	56.8
Magnesium	no criterion	7	6.88	7.44	7.88	7.63	7.9	8.54	8.04	8.14	8.22	9.13	9.37
Potassium	no criterion				3.15		3.37		3.17	3.11	3.28	3.39	3.33
Sodium	20/200**	6.86	6.73	7.12	7.36	7.31	7.66	8.19	7.45	7.43	7.59	7.97	8.11
Iron	0.3**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.058	<0.010	<0.010
Manganese	0.05**				0.013		0.014		0.017		0.033		0.027
Ammonia (total)	no criterion	<0.02	<0.02	0.04	0.03	<0.02	0.04	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion				<0.10		0.1		0.11		0.12		0.1
Nitrite	1*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05		<0.05
Nitrate	10*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DOC	5*	0.9	1.2	1.1	1.3	1.4	1.6	1.5	1.5		1.7		1.6
COD	no criterion	<5	<5	<5	<5	<5	<5	<5	<5		<5		<5
Phenols	no criterion				<0.001		<0.001		<0.001		<0.001		<0.001
Boron	5*	0.017	0.024	0.021	0.016	0.022	0.018	0.022	0.023	0.023	0.028	0.024	0.025
Phosphate	no criterion												
Aluminum	0.10***												
Barium	1*	0.204	0.234	0.237	0.216	0.242	0.247	0.223	0.267	0.272	0.266	0.269	0.306
Beryllium	no criterion												
Bismuth	no criterion												
Cadmium	0.005*				<0.001		<0.001		<0.001		<0.001		<0.001
Chromium	0.05*				<0.003		<0.003		<0.003		<0.003		<0.003
Cobalt	no criterion												
Copper	1*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003		<0.003		<0.003
Lead	0.01*				<0.002		<0.002		<0.002		<0.002		<0.001
Molybdenum	no criterion												
Nickel	no criterion												
Phosphorus (total)	no criterion	0.08	0.06	0.03	<0.05	0.04	<0.05	0.02	0.06		<0.05		0.03
Silver	no criterion												
Strontium	no criterion												
Titanium	no criterion												
Vanadium	no criterion												
Zinc	5**	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	500**	160	190	208	212	216	180	228	204	200	210	226	222
Selenium	no criterion												
Antimony	0.006*												
Mercury	0.001				<0.0001		<0.0001		<0.0001		<0.0001		<0.0001
Arsenic	0.025*				<0.003		<0.003		<0.003		<0.003		<0.003

NOTES:

- Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
 - * indicates health related ODWSOG.
 - ** indicates aesthetic objective for ODWSOG.
 - *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1	BH07-1
DATE		15-May-19	17-Sep-19	13-May-20	10-Sep-20	13-May-21	21-Sep-21	5-May-22	15-Sep-22	10-May-23	20-Sep-23	1-May-24	30-Sep-24
pH	6.5 to 8.5***	7.84	7.64	8.09	7.45	7.5	7.33	7.71	8	7.84	7.34	7.96	7.69
Conductivity	no criterion	423	432	413	410	411	441	443	470	457	422	483	425
Alkalinity (as CaCO ₃)	30-500**	156	140	148	171	157	157	155	160	170	182	194	174
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	156	140	148	171	157	157	155	160	170	182	194	174
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***												
Chloride	250**	27.8	30.5	30.6	30.8	29.9	29.1	28.8	30.5	28.6	31.2	30	29.8
Sulphate	500**	22.2	23	22.6	22.4	21.9	23.8	22.5	24.1	21.5	23.4	20.9	21.8
Calcium	no criterion	55.6	57.5	56.3	60.8	59.4	62.1	60.6	72.2	65.7	68.6	48	68.7
Magnesium	no criterion	8.55	8.93	9.16	9.98	9.9	10	9.99	11.2	11	10.2	8.69	11.7
Potassium	no criterion	3.25	3.48	3.15	3.47	3.29	3.56	3.53	3.75	3.58	3.74	2.62	3.76
Sodium	20/200**	7.83	8.11	7.75	8.42	8.36	8.49	8.61	8.29	9.27	9.54	6.65	9.4
Iron	0.3**	<0.010	<0.010	<0.010	0.054	0.036	<0.010	<0.010	0.017	0.021	0.014	<0.020	<0.010
Manganese	0.05**		0.022		0.022		0.026		0.021		0.028		0.02
Ammonia (total)	no criterion	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion		0.1		<0.10		0.13		0.18		<0.10		<0.10
Nitrite	1*		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05
Nitrate	10*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DOC	5*		1.3		1.3		2.1		1.7		1.3		1.2
COD	no criterion		<5		<5		<5		39		<5		12
Phenols	no criterion				<0.001		0.006		0.002		0.004		<0.001
Boron	5*	0.026	0.026	0.024	0.019	0.03	0.033	0.032	0.029	0.03	0.034	0.048	0.031
Phosphate	no criterion												
Aluminum	0.10***												
Barium	1*	0.282	0.262	0.324	0.325	0.32	0.351	0.344	0.344	0.312	0.329	0.335	0.328
Beryllium	no criterion												
Bismuth	no criterion												
Cadmium	0.005*		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001
Chromium	0.05*		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003
Cobalt	no criterion												
Copper	1*		<0.003		<0.003		<0.003		0.023		<0.003		<0.003
Lead	0.01*		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001
Molybdenum	no criterion												
Nickel	no criterion												
Phosphorus (total)	no criterion		0.06		<0.02		0.04		0.05		0.48		0.07
Silver	no criterion												
Strontium	no criterion												
Titanium	no criterion												
Vanadium	no criterion												
Zinc	5**	<0.005	<0.005	<0.005	0.032	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.022	<0.005
Total Dissolved Solids	500**	184	214	234	252	240	238	246	244	252	262	246	228
Selenium	no criterion												
Antimony	0.006*												
Mercury	0.001		<0.0001		<0.0001		<0.0001		<0.0001		<0.0001		<0.0001
Arsenic	0.025*		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003

NOTES:

- 1) Blank indicates data not available.
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 - 3) * indicates health related ODWSOG.
 - 4) ** indicates aesthetic objective for ODWSOG.
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- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2
DATE		02-Nov-07	19-Jun-08	09-Jun-09	14-Sep-10	31-May-11	21-Sep-11	16-May-12	12-Sep-12	15-May-13	11-Sep-13
pH	6.5 to 8.5***	7.80	7.9	7.1	7.6	7.81	7.92	7.58	7.78	7.49	7.05
Conductivity	no criterion	199	171	176	205	176	190	217	206	209	248
Alkalinity (as CaCO ₃)	30-500**	60	57	61	63	55	68	70	73	63	82
Bicarbonate Alkalinity (as CaCO ₃)	no criterion				62	55	68	70	73	63	82
Carbonate Alkalinity (as CaCO ₃)	no criterion										
Hardness	80-100***	<1	<1	<1	<1	<5	<5	<5	<5	<5	<5
Chloride	250**	80	86	68	85						
Sulphate	500**	15	10	10	16	12.4	13.8	14.7	14.6	16.7	28
Calcium	no criterion	12	11	11	12	15.6	13.3	12.2	13.9	13.4	12.4
Magnesium	no criterion	25	27	21	27	24.2	27	29.3	30.1	27.3	34.4
Potassium	no criterion	4.10	4.4	3.4	4.3	3.72	3.94	4.48	4.37	4	5.1
Sodium	20/200**	2.1	1.7	1.4							
Iron	0.3**	5.5	5.4	4.0		4.44	4.8	4.75	4.53	6.28	7.81
Manganese	0.05**	<0.100	<0.100	<0.1	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Ammonia (total)	no criterion	0.023	0.009	0.006							
Total Kjeldahl Nitrogen	no criterion	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrite	1*	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	10*	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DOC	5*	0.90	1.1	0.4		1.5	0.7	1.9	0.6	0.9	0.9
COD	no criterion					<5	<5	<5	<5	<5	<5
Phenols	no criterion										
Boron	5*	0.018	0.016	0.014	0.015	0.013	0.017	0.012	0.018	0.013	0.024
Phosphate	no criterion	<0.01	<0.01	<0.01							
Aluminum	0.10***	0.024	0.008	0.009							
Barium	1*	0.160	0.18	0.17	0.22	0.195	0.21	0.176	0.221	0.19	0.363
Beryllium	no criterion	<0.0005	<0.0005	<0.0005							
Bismuth	no criterion	<0.001	<0.001	<0.001							
Cadmium	0.005*	<0.0001	<0.0001	<0.0001							
Chromium	0.05*	<0.005	<0.005	<0.005							
Cobalt	no criterion	<0.0005	<0.0005	<0.0005							
Copper	1*	0.002	0.005	0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Lead	0.01*	<0.0005	<0.0005	<0.0005							
Molybdenum	no criterion	0.001	<0.001	<0.001							
Nickel	no criterion	<0.001	<0.001	<0.001							
Phosphorus (total)	no criterion	<0.1	<100	<0.1	0.09	<0.05	<0.05	<0.05	0.07	0.12	<0.05
Silver	no criterion	<0.0001	<0.0001	0.0003							
Strontium	no criterion	0.570	0.9	0.69							
Titanium	no criterion	<0.005	<0.005	<0.005							
Vanadium	no criterion	<0.001	<0.001	<0.001							
Zinc	5**	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	0.024	0.015	<0.005
Total Dissolved Solids	500**	113	106	100	117	112	120	114	130	118	164
Selenium	no criterion	<0.002	<0.002	<0.002							
Antimony	0.006*	<0.0005	<0.0005	<0.0005							
Mercury	0.001										
Arsenic	0.025*	<0.001	<0.001	<0.001							

NOTES:

- Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
 - * indicates health related ODWSOG.
 - ** indicates aesthetic objective for ODWSOG.
 - *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH07-2	BH07-2	BH07-2	BH07-2	BH7-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2
DATE		21-May-14	10-Sep-14	06-May-15	23-Sep-15	18-May-16	14-Sep-16	24-May-17	19-Sep-17	22-May-18	19-Sep-18	15-May-19	17-Sep-19
pH	6.5 to 8.5***	7.69	7.78	7.83	7.91	7.34	7.74	7.81	7.8	7.07	7.49	7.11	7.35
Conductivity	no criterion	184	230	190	216	221	224	185	199	207	215	162	222
Alkalinity (as CaCO ₃)	30-500**	57	68	62	64	69	70	62	67	83	58	57	65
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	57	68	62	64	69	70	62	67	83	58	57	65
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***												
Chloride	250**	11.7	18.8	11.9	14.3	16.1	15.5	11.9	12.6	12.8	16.3	8.43	13.2
Sulphate	500**	11.3	13.2	11.4	13	14.9	12.9	12.1	11.8	13.3	15.4	9.78	13
Calcium	no criterion	25	30.7	24.2	26	25.4	27.1	21.7	22.7	28.4	27.4	18.6	27.3
Magnesium	no criterion	3.8	4.44	3.47	3.88	3.98	4.04	3.43	3.56	3.92	4.18	2.77	3.9
Potassium	no criterion		1.93		1.72		1.78	1.59	1.62	1.68	1.69	1.38	1.73
Sodium	20/200**	5.34	6.39	4.9	5.49	5.79	5.33	4.98	5.04	4.73	5.67	3.96	4.85
Iron	0.3**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Manganese	0.05**		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002
Ammonia (total)	no criterion	<0.02	0.04	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion		<0.10		<0.10		0.11		<0.10		0.12		<0.10
Nitrite	1*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05		<0.05		<0.05
Nitrate	10*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DOC	5*	1.3	0.9	1.1	0.7	0.8	0.8		1.3		1.1		<0.5
COD	no criterion	<5	<5	<5	<5	<5	<5		<5		<5		6
Phenols	no criterion		<0.001		<0.001		<0.001		<0.001		<0.001		
Boron	5*	0.013	0.013	0.013	0.012	0.015	0.016	0.016	0.019	0.016	0.022	0.012	0.015
Phosphate	no criterion												
Aluminum	0.10***												
Barium	1*	0.192	0.239	0.187	0.197	0.215	0.243	0.207	0.193	0.22	0.266	0.167	0.177
Beryllium	no criterion												
Bismuth	no criterion												
Cadmium	0.005*		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001
Chromium	0.05*		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003
Cobalt	no criterion												
Copper	1*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003		<0.003		<0.003		<0.003
Lead	0.01*		<0.002		<0.002		<0.002		<0.002		<0.001		<0.001
Molybdenum	no criterion												
Nickel	no criterion												
Phosphorus (total)	no criterion	0.04	0.05	0.04	<0.05	0.05	<0.05		<0.05		0.03		<0.02
Silver	no criterion												
Strontium	no criterion												
Titanium	no criterion												
Vanadium	no criterion												
Zinc	5**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	500**	104	148	124	104	128	128	100	106	112	120	94	108
Selenium	no criterion												
Antimony	0.006*												
Mercury	0.001		<0.0001		<0.0001		<0.0001		<0.0001		<0.0001		<0.0001
Arsenic	0.025*		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003

NOTES:

- 1) Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
 - 3) * indicates health related ODWSOG.
 - 4) ** indicates aesthetic objective for ODWSOG.
 - 5) *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2	BH07-2
DATE		13-May-20	10-Sep-20	13-May-21	21-Sep-21	5-May-22	15-Sep-22	10-May-23	20-Sep-23	1-May-24	30-Sep-24
pH	6.5 to 8.5***	7.55	6.65	6.9	6.72	7.32	7.72	7.61	6.75	7.48	7.13
Conductivity	no criterion	183	182	168	203	204	238	209	205	187	217
Alkalinity (as CaCO ₃)	30-500**	60	67	59	70	65	113	69	74	67	70
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	60	67	59	70	65	113	69	74	67	70
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***										
Chloride	250**	12.6	13	11.8	14.6	12.8	16.1	13.5	16.6	10.9	15.7
Sulphate	500**	12	12	10.9	14.2	12.6	15.1	12.2	15.6	9.89	15
Calcium	no criterion	23.3	24.8	21.6	25.6	22.8	28.8	26.7	28.2	16.4	25
Magnesium	no criterion	3.55	3.85	3.52	4.08	3.61	4.37	3.98	4.17	2.9	4.6
Potassium	no criterion	1.54	1.71	1.51	1.82	1.63	1.89	1.71	1.75	0.69	1.89
Sodium	20/200**	5.05	5.41	4.58	5.19	5.08	5.17	5.46	5.95	3.37	5.69
Iron	0.3**	<0.010	0.028	0.017	<0.010	<0.010	<0.010	0.018	<0.010	<0.020	<0.010
Manganese	0.05**		0.134		0.004		0.003		0.002		<0.002
Ammonia (total)	no criterion	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion		0.15		0.12		<0.10		<0.10		<0.10
Nitrite	1*		<0.05		<0.05		<0.05		<0.05		<0.05
Nitrate	10*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DOC	5*		1		1		1		0.7		0.8
COD	no criterion		<5		<5		13		8		10
Phenols	no criterion		<0.001		<0.001		<0.001		0.002		<0.001
Boron	5*	0.017	0.014	0.017	0.023	0.02	0.02	0.018	0.029	0.034	0.027
Phosphate	no criterion										
Aluminum	0.10***										
Barium	1*	0.23	0.243	0.188	0.251	0.216	0.232	0.201	0.237	0.192	0.237
Beryllium	no criterion										
Bismuth	no criterion										
Cadmium	0.005*		<0.001		<0.001		<0.001		<0.001		<0.001
Chromium	0.05*		<0.003		<0.003		<0.003		<0.003		<0.003
Cobalt	no criterion										
Copper	1*		0.007		<0.003		<0.003		<0.003		<0.003
Lead	0.01*		<0.001		<0.001		<0.001		<0.001		<0.001
Molybdenum	no criterion										
Nickel	no criterion										
Phosphorus (total)	no criterion		<0.02		<0.02		0.03		0.5		0.05
Silver	no criterion										
Strontium	no criterion										
Titanium	no criterion										
Vanadium	no criterion										
Zinc	5**	<0.005	0.013	<0.005	<0.005	<0.005	<0.005	0.021	<0.005	<0.005	<0.005
Total Dissolved Solids	500**	106	112	102	118	116	126	76	136	108	100
Selenium	no criterion										
Antimony	0.006*										
Mercury	0.001		<0.0001		<0.0001		<0.0001		<0.0001		<0.0001
Arsenic	0.025*		<0.003		<0.003		<0.003		<0.003		<0.003

NOTES:

- 1) Blank indicates data not available.
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 - 4) ** indicates aesthetic objective for ODWSOG.
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TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH07-3	BH07-3	BH07-3	BH07-3	BH07-3	BH07-3	BH07-3	BH07-3	BH07-3	BH07-3
DATE		02-Nov-07	19-Jun-08	09-Jun-09	14-Sep-10	21-Sep-11	12-Sep-12	11-Sep-13	21-May-14	06-May-15	18-May-16
pH	6.5 to 8.5***	7.20	7.4	6.5	6.9	7.11	7.1	6.33	6.62	6.9	6.63
Conductivity	no criterion	165	162	122	104	100	121	126	448	328	192
Alkalinity (as CaCO ₃)	30-500**	32	24	25	28	28	27	30	17	20	26
Bicarbonate Alkalinity (as CaCO ₃)	no criterion				28	28	27	30	17	20	26
Carbonate Alkalinity (as CaCO ₃)	no criterion				<1	<5	<5	<5	<5	<5	<5
Hardness	80-100***	47	45	34	37						
Chloride	250**	8	27	16	6	6.71	14.1	16.9	116	81.6	18.8
Sulphate	500**	30	10	9	12	11.9	11.1	9	6.35	6.4	7.58
Calcium	no criterion	12	11	8.7	9.5	8.69	10.3	11	36.6	24.1	9.82
Magnesium	no criterion	4.10	4.1	3	3.2	3.05	3.7	3.82	13.2	8.25	3.45
Potassium	no criterion	1.5	1.5	1.5							
Sodium	20/200**	10	7.9	6.5		4.01	5.66	6.76	18.5	16	4.98
Iron	0.3**	<0.100	<0.100	<0.1	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Manganese	0.05**	0.035	0.034	0.004							
Ammonia (total)	no criterion	<0.05	<0.05	<0.05	<0.05	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion										
Nitrite	1*	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	10*	0.20	0.5	0.3	0.2	0.2	0.27	0.27	0.32	0.21	0.36
DOC	5*	2.00	1.5	1.6		1.4	1	1.2	1.4	1.8	1.7
COD	no criterion					<5	<5	<5	<5	<5	<5
Phenols	no criterion										
Boron	5*	0.012	<0.01	<0.01	0.011	<0.010	<0.010	0.012	<0.010	<0.010	<0.010
Phosphate	no criterion	<100	<0.01	<0.01							
Aluminum	0.10***	0.026	0.008	0.01							
Barium	1*	0.014	0.018	0.01	0.007	0.006	0.011	0.01	0.037	0.02	0.008
Beryllium	no criterion	<0.0005	<0.0005	<0.0005							
Bismuth	no criterion	<0.001	<0.001	<0.001							
Cadmium	0.005*	<0.0001	<0.0001	<0.0001							
Chromium	0.05*	<0.005	<0.005	<0.005							
Cobalt	no criterion	0.002	0.0009	0.0007							
Copper	1*	0.003	0.002	0.002	0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Lead	0.01*	<0.0005	<0.0005	<0.0005							
Molybdenum	no criterion	<0.001	<0.001	<0.001							
Nickel	no criterion	0.002	<0.001	<0.001							
Phosphorus (total)	no criterion	<0.1	<100	<0.1	0.08	<0.05	0.06	<0.05	0.03	0.04	0.04
Silver	no criterion	<0.0001	<0.0001	0.0001							
Strontium	no criterion	0.070	0.081	0.59							
Titanium	no criterion	<0.005	<0.005	<0.005							
Vanadium	no criterion	<0.001	<0.001	<0.001							
Zinc	5**	0.007	<0.005	0.005	<0.005	0.005	0.024	<0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	500**	100	91	73	70	62	94	96	312	190	138
Selenium	no criterion	<0.002	<0.002	<0.002							
Antimony	0.006*	<0.0005	<0.0005	<0.0005							
Mercury	0.001										
Arsenic	0.025*	<0.001	<0.001	<0.001							

NOTES:

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TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH07-3	BH07-3	BH07-3	BH07-3	BH07-3	BH07-3	BH07-3	BH07-3
DATE		24-May-17	22-May-18	15-May-19	13-May-20	13-May-21	5-May-22	10-May-23	1-May-24
pH	6.5 to 8.5***	7.4	6.49	6.77	7.09	6.48	6.64	6.69	6.69
Conductivity	no criterion	271	228	318	92	104	295	256	288
Alkalinity (as CaCO ₃)	30-500**	26	28	27	26	26	26	27	30
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	26	28	27	26	26	26	27	30
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***								
Chloride	250**	61.8	51.5	71	7.82	14.7	70.9	54.8	63
Sulphate	500**	7.64	6.86	6.38	6	5.22	5.63	5.7	4.99
Calcium	no criterion	19.1	16.9	22	7.59	7.27	18.9	19.5	13.6
Magnesium	no criterion	7.07	6.13	7.53	2.54	2.62	6.48	7.31	6.11
Potassium	no criterion	2.31	2.19	2.42	1.3	1.46	2.27	2.31	1.2
Sodium	20/200**	12.8	11	14	3.25	5.32	12.9	14	10.8
Iron	0.3**	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	0.017	0.035
Manganese	0.05**								
Ammonia (total)	no criterion	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion								
Nitrite	1*								
Nitrate	10*	0.27	0.21	0.26	0.23	0.24	0.18	0.22	0.21
DOC	5*								
COD	no criterion								
Phenols	no criterion								
Boron	5*	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.022
Phosphate	no criterion								
Aluminum	0.10***								
Barium	1*	0.019	0.014	0.023	0.006	0.008	0.022	0.026	0.022
Beryllium	no criterion								
Bismuth	no criterion								
Cadmium	0.005*								
Chromium	0.05*								
Cobalt	no criterion								
Copper	1*								
Lead	0.01*								
Molybdenum	no criterion								
Nickel	no criterion								
Phosphorus (total)	no criterion								
Silver	no criterion								
Strontium	no criterion								
Titanium	no criterion								
Vanadium	no criterion								
Zinc	5**	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	0.016	<0.005
Total Dissolved Solids	500**	182	190	174	62	66	192	126	202
Selenium	no criterion								
Antimony	0.006*								
Mercury	0.001								
Arsenic	0.025*								

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TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2
DATE		14-Feb-01	16-Nov-01	27-Aug-02	23-Nov-04	18-May-05	03-May-06	30-May-07	02-Nov-07	03-May-10	14-Sep-10
pH	6.5 to 8.5***	6.96	6.23	6.82	7.25	7.67	7.30	7.40	7.60	7.60	7.3
Conductivity	no criterion	2010	3159	2495	1240	1310	1130	1110	1010	1220	1160
Alkalinity (as CaCO ₃)	30-500**	473	248	213	223	262	258	263	256	283	296
Bicarbonate Alkalinity (as CaCO ₃)	no criterion									282	295
Carbonate Alkalinity (as CaCO ₃)	no criterion									1	<1
Hardness	80-100***	1149	1105	872	567	590	530	470	460	460	440
Chloride	250**	95	74	83	85	89	76	55	45	130	93
Sulphate	500**	770	1010	753	357	272	255	292	222	200	180
Calcium	no criterion	332	332	247	160	166	160	150	140	150	140
Magnesium	no criterion	77	67	62	41	42	32	26	24	22	
Potassium	no criterion	9.00	7.70	5.60	4.70	4.70	5.40	4.90	6.30	5.30	
Sodium	20/200**	55.30	56.60	53.10	50.20	58.20	59.00	51.00	54.0	63.0	
Iron	0.3**	<0.01	10.70	<0.03	7.05	0.0006	7.50	5.60	7.30	2.2	3.3
Manganese	0.05**	5.190	7.790	7.980	4.110	5.360	5.400	4.700	3.800	1.800	
Ammonia (total)	no criterion	<0.03	<0.03	<0.03	<0.03	0.27	0.24	0.18	0.20	<0.05	<0.05
Total Kjeldahl Nitrogen	no criterion									2	
Nitrite	1*	<0.2	<0.2	<0.2	<0.2	<0.2	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate	10*	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
DOC	5*	14.0	9.80	13.80	8.80	8.90	8.90	8.40	8.40	6.6	
COD	no criterion										
Phenols	no criterion									<0.001	
Boron	5*	0.69	0.77	1.05	0.78	0.74	0.67	0.73	0.70	0.82	0.78
Phosphate	no criterion	<1	<1	<1	<0.3	<0.3	<0.01	<0.01	<0.01		
Aluminum	0.10***	<0.03	<0.005	0.0060	<0.005	<0.005	<0.005	<0.005	<0.005		
Barium	1*	0.0980	0.0430	0.0300	0.0320	0.0280	0.0340	0.0310	0.0310	0.0320	0.037
Beryllium	no criterion	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		
Bismuth	no criterion	<0.2	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001		
Cadmium	0.005*	<0.005	<0.001	<0.001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	0.05*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Cobalt	no criterion	0.0090	0.0251	0.0141	0.0028	0.0040	0.0045	0.0049	0.0032		
Copper	1*	<0.005	<0.0005	0.0019	0.0015	0.0040	0.0020	0.0020	0.0030	0.0020	0.002
Lead	0.01*	<0.05	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	
Molybdenum	no criterion	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Nickel	no criterion	<0.02	0.018	0.0130	0.0040	0.0010	0.0040	0.0040	0.0040		
Phosphorus (total)	no criterion	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.1	0.5000	2.0
Silver	no criterion	<0.005	<0.001	0.0003	<0.0001	<0.0005	<0.0001	<0.0001	<0.0001		
Strontium	no criterion	1.3100	1.7100	1.4200	1.0400	1.0200	1.1000	0.9700	0.950		
Titanium	no criterion	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
Vanadium	no criterion	<0.005	<0.0005	0.0012	0.0010	<0.001	<0.001	<0.001	<0.001		
Zinc	5**	0.1270	0.1970	0.1040	0.0140	0.0150	<0.007	0.0300	0.0200	0.014	0.008
Total Dissolved Solids	500**	1574	1678	1310	842	808	755	757	673	748	701
Selenium	no criterion	<0.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		
Antimony	0.006*	<0.2	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0005		
Mercury	0.001									<0.0001	
Arsenic	0.025*	<0.02	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	

NOTES:

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- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2	BH2
DATE		31-May-11	21-Sep-11	16-May-12	12-Sep-12	15-May-13	11-Sep-13	21-May-14	06-May-15	18-May-16	24-May-17	22-May-18	15-May-19
pH	6.5 to 8.5***	6.48	7.8	7.84	7.4	7.21	6.45	7.16	7.21	7.27	7.59	7.22	7.55
Conductivity	no criterion	1050	1030	1340	1180	1390	1200	1420	1670	1520	1380	1470	1910
Alkalinity (as CaCO ₃)	30-500**	298	287	300	295	306	338	303	332	304	292	393	514
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	298	287	300	295	306	338	303	332	304	292	393	514
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***												
Chloride	250**	122	125	169	187	228	191	230	308	300	251	283	266
Sulphate	500**	176	182	145	147	101	103	91.6	84.2	62.1	54.6	83.4	176
Calcium	no criterion	148	143	164	147	158	139	138	170	130	107	146	456
Magnesium	no criterion	19.9	18.5	21	18.6	20.2	17.5	18.7	23.6	19.8	15.2	21.8	66.7
Potassium	no criterion	5.36		5.93		6.87					7.32	7.13	19.1
Sodium	20/200**	57.6	60	69.8	72.2	93.2	90.3	98.2	116	123	118	125	361
Iron	0.3**	0.049	7.74	9.69	12.7	5.32	5.65	2.54	0.551	2.62	6.32	7.76	9.84
Manganese	0.05**	2.67		3.16		3.31							
Ammonia (total)	no criterion	<0.02	0.06	0.09	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion	0.35		0.16		0.14							
Nitrite	1*	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.25	<0.5	<0.25			
Nitrate	10*	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.25	<0.5	<0.25	<0.25	<0.25	<0.5
DOC	5*	7.1	13.9	6.9	7.9	6	7.7	6	8	7.7			
COD	no criterion	<5	19	10	29	16	21	12	17	14			
Phenols	no criterion	<0.001		<0.001		<0.001							
Boron	5*	0.692	0.646	0.709	0.726	0.597	0.567	0.504	0.503	0.284	0.312	0.328	0.504
Phosphate	no criterion			0.56									
Aluminum	0.10***												
Barium	1*	0.039	0.047	0.046	0.051	0.056	0.063	0.06	0.056	0.085	0.093	0.088	0.134
Beryllium	no criterion												
Bismuth	no criterion												
Cadmium	0.005*	<0.002		<0.001		<0.001							
Chromium	0.05*	<0.003		<0.003		0.007							
Cobalt	no criterion												
Copper	1*	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003			
Lead	0.01*	<0.002		<0.002		<0.002							
Molybdenum	no criterion												
Nickel	no criterion												
Phosphorus (total)	no criterion	<0.05	0.7	0.6	0.3	0.19	0.21	1.1	0.28	0.27			
Silver	no criterion												
Strontium	no criterion												
Titanium	no criterion												
Vanadium	no criterion												
Zinc	5**	0.03	0.01	0.015	0.042	0.017	0.012	0.01	0.007	0.014	0.011	0.017	0.013
Total Dissolved Solids	500**	774	758	830	806	810	834	856	968	886	796	962	998
Selenium	no criterion												
Antimony	0.006*												
Mercury	0.001	<0.0001				<0.0001							
Arsenic	0.025*	<0.003				<0.003							

NOTES:

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TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH2	BH2	BH2	BH2	BH2
DATE		13-May-20	13-May-21	5-May-22	10-May-23	1-May-24
pH	6.5 to 8.5***	7.37	6.83	7.01	6.81	6.76
Conductivity	no criterion	1770	1620	1340	1280	1110
Alkalinity (as CaCO ₃)	30-500**	428	472	392	380	404
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	428	472	392	380	404
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5
Hardness	80-100***					
Chloride	250**	312	247	185	172	158
Sulphate	500**	79.6	79.8	44.6	42.3	38.3
Calcium	no criterion	157	148	105	108	58.7
Magnesium	no criterion	23.2	24.5	16.8	18.5	9.8
Potassium	no criterion	6.64	6.45	6.4	6.35	5.48
Sodium	20/200**	138	163	144	153	120
Iron	0.3**	15.5	7.71	3.6	11.1	6.55
Manganese	0.05**					
Ammonia (total)	no criterion	<0.02	<0.02	<0.02	0.03	0.07
Total Kjeldahl Nitrogen	no criterion					
Nitrite	1*					
Nitrate	10*	<0.5	<0.05	<0.05	<0.05	<0.05
DOC	5*					
COD	no criterion					
Phenols	no criterion					
Boron	5*	0.492	0.644	0.412	0.415	0.453
Phosphate	no criterion					
Aluminum	0.10***					
Barium	1*	0.125	0.102	0.085	0.11	0.101
Beryllium	no criterion					
Bismuth	no criterion					
Cadmium	0.005*					
Chromium	0.05*					
Cobalt	no criterion					
Copper	1*					
Lead	0.01*					
Molybdenum	no criterion					
Nickel	no criterion					
Phosphorus (total)	no criterion					
Silver	no criterion					
Strontium	no criterion					
Titanium	no criterion					
Vanadium	no criterion					
Zinc	5**	0.009	0.011	0.025	0.012	0.006
Total Dissolved Solids	500**	1090	1020	758	768	728
Selenium	no criterion					
Antimony	0.006*					
Mercury	0.001					
Arsenic	0.025*					

NOTES:

- 1) Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
 - 3) * indicates health related ODWSOG.
 - 4) ** indicates aesthetic objective for ODWSOG.
 - 5) *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH3	BH3	BH3	BH3	BH3	BH3	BH3	BH3	BH3	BH3
DATE		14-Feb-01	16-Nov-01	27-Aug-02	20-May-03	23-Nov-04	18-May-05	03-May-06	30-May-07	02-Nov-07	14-Sep-10
pH	6.5 to 8.5***	6.57	6.50	6.66	6.68	7.02	7.57	7.10	7.30	8.00	7.30
Conductivity	no criterion	952	1222	1434	1190	1200	1270	1510	1730	1700	1640
Alkalinity (as CaCO ₃)	30-500**	218	177	178	128	118	128	188	239	229	280
Bicarbonate Alkalinity (as CaCO ₃)	no criterion										280
Carbonate Alkalinity (as CaCO ₃)	no criterion										<1
Hardness	80-100***	416	386	425	618	528	530	650	810	910	700
Chloride	250**	46	70	86	39	59	53	79	80	60	83
Sulphate	500**	298	271	341	442	435	398	524	601	628	450
Calcium	no criterion	135	134	142	219	188	184	220	280	330	250
Magnesium	no criterion	19	12	17	17	14	18	21	24	22	17
Potassium	no criterion	20.00	26.00	29.10	26.00	25.30	27.00	29.00	28.00	31	
Sodium	20/200**	42.10	38.10	49.70	29.70	40.20	51.70	49.00	41.00	54	79
Iron	0.3**	0.02	<0.03	<0.03	0.05	0.03	<0.05	<0.05	<0.05	<0.10	0.11
Manganese	0.05**	5.330	2.770	3.250	1.510	1.430	1.510	2.000	1.100	0.510	
Ammonia (total)	no criterion	0.20	0.13	0.32	0.09	<0.03	0.15	0.13	0.16	0.06	1.30
Total Kjeldahl Nitrogen	no criterion										
Nitrite	1*	<0.2	<0.2	<0.2		2.70	<0.2	<0.01	<0.01	<0.01	0.04
Nitrate	10*	1.00	<0.2	0.40	1.80	<0.2	<0.2	0.30	0.80	1.20	0.3
DOC	5*	10.10	10.50	13.80	13.30	19.50	16.40	21.00	20.90	20.40	
COD	no criterion										
Phenols	no criterion										
Boron	5*	0.42	0.49	0.50		0.42	0.38	0.49	0.57	0.54	0.58
Phosphate	no criterion	<1	<1	<1		<0.3	<0.3	<0.01	<0.01	<0.01	
Aluminum	0.10***	<0.03	0.0130	0.0140		0.0220	0.0290	0.0310	0.0310	0.0320	
Barium	1*	0.0450	0.0630	0.0790		0.0570	0.0460	0.0530	0.0610	0.0660	0.061
Beryllium	no criterion	<0.0005	<0.001	<0.001		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Bismuth	no criterion	<0.2	<0.001	<0.001		<0.001		<0.001	<0.001	<0.001	
Cadmium	0.005*	<0.005	0.0002	0.0005		0.0004	0.0002	0.0003	0.0002	0.0001	
Chromium	0.05*	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	
Cobalt	no criterion	0.0200	0.0159	0.0187		0.0065	0.0072	0.0067	0.0044	0.0031	
Copper	1*	0.0060	0.0057	0.0557	0.0060	0.0136	0.0180	0.0160	0.0200	0.0210	0.020
Lead	0.01*	<0.05	<0.0005	<0.0005		<0.0005	0.0005	<0.05	<0.0005	<0.0005	
Molybdenum	no criterion	<0.02	<0.001	<0.001		0.0010	<0.001	<0.001	<0.001	<0.001	
Nickel	no criterion	<0.02	0.0090	0.0100		0.0020	<0.001	0.0020	0.0030	<0.005	
Phosphorus (total)	no criterion	<0.1	<0.05	<0.05		<0.05	<0.05	<0.05	<0.050	<0.1	6.2
Silver	no criterion	<0.005	<0.0001	0.0005		<0.0001	<0.0005	<0.0001	<0.0001	<0.0001	
Strontium	no criterion	0.6550	0.7210	0.8910		1.0000	1.0300	1.1000	1.4000	1.8000	
Titanium	no criterion	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	
Vanadium	no criterion	<0.005	<0.0005	0.0009		0.0006	<0.001	<0.001	<0.001	<0.001	
Zinc	5**	0.0930	0.0590	0.0590	0.0770	0.0360	0.0320	0.0300	0.0210	0.0280	0.016
Total Dissolved Solids	500**	669	640	753	865	849	811	1040	1210	1270	1090
Selenium	no criterion	<0.2	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	
Antimony	0.006*	<0.2	<0.0005	<0.0005		<0.0005	<0.001	<0.001	<0.0005	<0.0005	
Mercury	0.001										
Arsenic	0.025*	<0.02	<0.002	<0.002		<0.002	<0.001	<0.001	<0.001	<0.001	

NOTES:

- Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
 - * indicates health related ODWSOG.
 - ** indicates aesthetic objective for ODWSOG.
 - *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH3	BH3	BH3	BH3	BH3	BH3	BH3	BH3	BH3	BH3	BH3	BH3
DATE		21-Sep-11	12-Sep-12	11-Sep-13	21-May-14	06-May-15	18-May-16	24-May-17	22-May-18	15-May-19	13-May-20	13-May-21	5-May-22
pH	6.5 to 8.5***	7.28	7.36	6.61	7.35	7.49	7.45	7.94	7.36	7.76	7.47	7.02	7.1
Conductivity	no criterion	1060	1270	1600	1750	1800	1410	1210	1120	1270	1280	1380	1500
Alkalinity (as CaCO ₃)	30-500**	240	295	403	357	393	432	354	337	395	416	348	303
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	240	295	403	357	393	432	354	337	395	416	348	303
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***												
Chloride	250**	130	144	94.2	90	78.3	92.5	120	129	102	111	127	145
Sulphate	500**	225	257	549	517	536	218	112	146	135	142	243	294
Calcium	no criterion	127	164	287	268	307	170	132	96.4	109	117	124	133
Magnesium	no criterion	21	13	26.1	22.8	22.9	15	13.7	17	19.8	21.2	29.2	30.8
Potassium	no criterion							29.3	30.1	35.5	31.5	39	43.4
Sodium	20/200**	68	80	69.1	62.9	65.2	76.6	102	103	93	77.5	104	113
Iron	0.3**	9.12	0.07	0.036	0.424	0.327	0.451	0.441	<0.010	0.417	0.189	0.105	0.635
Manganese	0.05**												
Ammonia (total)	no criterion	1.66	1.57	0.64	0.9	0.8	0.74	0.77	1.13	1.13	1.26	1.34	1.44
Total Kjeldahl Nitrogen	no criterion												
Nitrite	1*	<0.05	<0.05	<0.5	<0.5	<0.5	<0.25						
Nitrate	10*	<0.05	<0.05	<0.5	<0.5	<0.5	<0.25	<0.25	<0.25	<0.25	<0.25	0.2	<0.05
DOC	5*	22.80	18.40	31.9	25.3	29.9	25						
COD	no criterion	29	54	72	64	64	53						
Phenols	no criterion												
Boron	5*	0.83	0.66	0.709	0.593	0.595	0.549	0.626	0.661	0.716	0.638	0.641	0.619
Phosphate	no criterion												
Aluminum	0.10***												
Barium	1*	0.124	0.043	0.054	0.045	0.047	0.038	0.055	0.049	0.076	0.081	0.084	0.105
Beryllium	no criterion												
Bismuth	no criterion												
Cadmium	0.005*												
Chromium	0.05*												
Cobalt	no criterion												
Copper	1*	<0.003	0.021	0.026	0.005	0.005	<0.003						
Lead	0.01*												
Molybdenum	no criterion												
Nickel	no criterion												
Phosphorus (total)	no criterion	0.7	4.2	0.68	1.28	0.38	0.43						
Silver	no criterion												
Strontium	no criterion												
Titanium	no criterion												
Vanadium	no criterion												
Zinc	5**	0.017	0.019	0.008	0.01	0.009	0.006	0.006	0.008	0.009	0.007	0.007	0.007
Total Dissolved Solids	500**	782	876	1370	1280	1320	842	684	674	694	794	920	972
Selenium	no criterion												
Antimony	0.006*												
Mercury	0.001												
Arsenic	0.025*												

NOTES:

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 - * indicates health related ODWSOG.
 - ** indicates aesthetic objective for ODWSOG.
 - *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH3	BH3
DATE		10-May-23	1-May-24
pH	6.5 to 8.5***	6.94	6.97
Conductivity	no criterion	1360	1690
Alkalinity (as CaCO ₃)	30-500**	361	408
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	361	408
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5
Hardness	80-100***		
Chloride	250**	99.4	173
Sulphate	500**	227	254
Calcium	no criterion	128	80.9
Magnesium	no criterion	24.2	21.9
Potassium	no criterion	42	32.4
Sodium	20/200**	115	105
Iron	0.3**	4.31	9.42
Manganese	0.05**		
Ammonia (total)	no criterion	1.65	5.29
Total Kjeldahl Nitrogen	no criterion		
Nitrite	1*		
Nitrate	10*	<0.05	<0.07
DOC	5*		
COD	no criterion		
Phenols	no criterion		
Boron	5*	0.467	0.387
Phosphate	no criterion		
Aluminum	0.10***		
Barium	1*	0.094	0.119
Beryllium	no criterion		
Bismuth	no criterion		
Cadmium	0.005*		
Chromium	0.05*		
Cobalt	no criterion		
Copper	1*		
Lead	0.01*		
Molybdenum	no criterion		
Nickel	no criterion		
Phosphorus (total)	no criterion		
Silver	no criterion		
Strontium	no criterion		
Titanium	no criterion		
Vanadium	no criterion		
Zinc	5**	0.012	0.018
Total Dissolved Solids	500**	878	1100
Selenium	no criterion		
Antimony	0.006*		
Mercury	0.001		
Arsenic	0.025*		

NOTES:

1) Blank indicates data not available.

Standards Objectives and Guidelines (2006).

3) * indicates health related ODWSOG.

4) ** indicates aesthetic objective for ODWSOG.

5) *** indicates operational guideline for ODWSOG.

or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1
DATE		14-Sep-10	31-May-11	21-Sep-11	16-May-12	12-Sep-12	15-May-13	11-Sep-13	21-May-14	10-Sep-14	06-May-15
pH	6.5 to 8.5***	6.7	5.72	6.75	7.02	6.95	6.48	5.77	6.71	6.62	6.79
Conductivity	no criterion	473	263	408	359	455	300	431	272	299	323
Alkalinity (as CaCO ₃)	30-500**	48	40	35	33	39	34	34	31	34	33
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	48	40	35	33	39	34	34	31	34	33
Carbonate Alkalinity (as CaCO ₃)	no criterion	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***	140									
Chloride	250**	75	41.8	76	50	79.9	44	71.7	40.2	49.3	52.4
Sulphate	500**	59	47.1	69.8	50	76.8	45.7	67.1	31.5	33.6	34
Calcium	no criterion	41	21.3	34.8	25.9	36.5	24	33.4	21.3	21.8	23.5
Magnesium	no criterion	9.1	6.1	9.51	7.57	10.4	7.25	9.2	6.18	6.11	6.29
Potassium	no criterion		1.73		1.98		2.04			2.08	
Sodium	20/200**	36	18.8	32.3	22.5	34.6	20.2	34.7	20	23.1	23.7
Iron	0.3**	<0.1	<0.010	<0.010	<0.010	0.913	0.41	0.499	<0.010	<0.010	<0.010
Manganese	0.05**		0.018		0.016		0.054			0.039	
Ammonia (total)	no criterion	0.2	<0.02	0.06	0.05	0.08	0.03	0.5	<0.02	0.03	<0.02
Total Kjeldahl Nitrogen	no criterion		<0.10		0.15		<0.10			<0.10	
Nitrite	1*	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	10*	0.1	0.1	0.19	0.22	0.48	0.22	0.32	0.27	0.29	0.21
DOC	5*		2.9	2.7	4.4	3.5	2.2	5.8	2.5	3.6	2.5
COD	no criterion		<5	<5	<5	11	5	19	6	<5	<5
Phenols	no criterion		<0.001		<0.001		<0.001			<0.001	
Boron	5*	0.23	0.122	0.206	0.142	0.225	0.106	0.259	0.113	0.206	0.176
Phosphate	no criterion				0.88						
Aluminum	0.10***										
Barium	1*	0.18	0.085	0.148	0.089	0.123	0.071	0.142	0.064	0.087	0.067
Beryllium	no criterion										
Bismuth	no criterion										
Cadmium	0.005*		<0.002		<0.001		<0.001			<0.001	
Chromium	0.05*		<0.003		<0.003		<0.003			<0.003	
Cobalt	no criterion										
Copper	1*	0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	<0.003
Lead	0.01*		<0.002		<0.002		<0.002			<0.002	
Molybdenum	no criterion										
Nickel	no criterion										
Phosphorus (total)	no criterion	3.0	<0.05	0.5	0.9	0.5	0.31	0.89	0.1	0.09	0.08
Silver	no criterion										
Strontium	no criterion										
Titanium	no criterion										
Vanadium	no criterion										
Zinc	5**		0.061	0.007	0.034	0.011	0.009	0.018	0.008	0.01	0.01
Total Dissolved Solids	500**	277	204	300	234	312	206	296	194	206	196
Selenium	no criterion										
Antimony	0.006*										
Mercury	0.001		<0.0001				<0.0001			<0.0001	
Arsenic	0.025*		<0.003				<0.003			<0.003	

NOTES:

- Blank indicates data not available.
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TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1	BH10-1
DATE		23-Sep-15	18-May-16	14-Sep-16	24-May-17	22-May-18	15-May-19	13-May-20	13-May-21	05-May-22	10-May-23	01-May-24
pH	6.5 to 8.5***	7.22	6.55	6.95	7.18	6.42	6.9	6.83	6.37	6.59	6.5	6.58
Conductivity	no criterion	410	307	449	325	344	310	226	307	311	353	369
Alkalinity (as CaCO ₃)	30-500**	34	31	41	34	42	42	35	53	46	48	62
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	34	31	41	34	42	42	35	53	46	48	62
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***											
Chloride	250**	74.5	50.8	74.6	53	50	35.3	26.6	44.7	42.6	42.5	43.5
Sulphate	500**	46.3	41.1	46.8	41.1	60.9	46.8	35.4	39.3	40	51.1	67.1
Calcium	no criterion	26	17.7	26.4	20.1	24.3	19.3	17.6	19.5	21.1	25.9	22.6
Magnesium	no criterion	6.97	5.55	7.15	6.11	7.15	5.4	5.08	5.7	6.07	8.29	6.81
Potassium	no criterion	2.79		2.82	2.13	2.33	2	1.68	1.78	1.98	2.21	2.62
Sodium	20/200**	34.2	23.4	37	26.6	28.6	23.8	22.4	25	25	31.2	23.4
Iron	0.3**	<0.010	<0.010	<0.010	<0.010	<0.010	0.016	<0.010	<0.010	0.014	1.18	0.071
Manganese	0.05**	0.026		0.007								
Ammonia (total)	no criterion	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion	0.25		0.22								
Nitrite	1*	<0.05	<1.0	<0.05								
Nitrate	10*	0.2	<1.0	0.32	0.28	0.15	0.08	0.11	0.13	0.08	0.14	0.14
DOC	5*	2.2	2.7	3								
COD	no criterion	<5	<5	8								
Phenols	no criterion	<0.001		<0.001								
Boron	5*	0.253	0.165	0.3	0.197	0.186	0.166	0.167	0.15	0.183	0.231	0.239
Phosphate	no criterion											
Aluminum	0.10***											
Barium	1*	0.092	0.064	0.102	0.082	0.07	0.063	0.066	0.05	0.066	0.075	0.076
Beryllium	no criterion											
Bismuth	no criterion											
Cadmium	0.005*	<0.001		<0.001								
Chromium	0.05*	0.004		<0.003								
Cobalt	no criterion											
Copper	1*	<0.003	<0.003	<0.003								
Lead	0.01*	<0.002		<0.002								
Molybdenum	no criterion											
Nickel	no criterion											
Phosphorus (total)	no criterion	0.09	0.04	<0.05								
Silver	no criterion											
Strontium	no criterion											
Titanium	no criterion											
Vanadium	no criterion											
Zinc	5**	0.01	0.01	0.006	<0.005	0.009	0.005	<0.005	0.008	<0.005	<0.005	<0.005
Total Dissolved Solids	500**	222	184	248	194	212	146	144	190	170	226	224
Selenium	no criterion											
Antimony	0.006*											
Mercury	0.001	<0.0001		<0.0001								
Arsenic	0.025*	<0.003		<0.003								

NOTES:

- 1) Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
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- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2
DATE		14-Sep-10	31-May-11	21-Sep-11	16-May-12	12-Sep-12	15-May-13	11-Sep-13	21-May-14	10-Sep-14	06-May-15
pH	6.5 to 8.5***	6.8	6.01	7.03	3.95	4.54	6.04	6.13	6.83	6.98	6.71
Conductivity	no criterion	343	190	298	1130	1400	1010	980	572	531	414
Alkalinity (as CaCO ₃)	30-500**	83	46	48	<5	<5	<5	45	39	36	49
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	83	46	48	<5	<5	<5	45	39	36	49
Carbonate Alkalinity (as CaCO ₃)	no criterion	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***	54									
Chloride	250**	30	32.2	66.0	302.0	535.0	353	297	148	144	92.3
Sulphate	500**	37	5.70	4.83	4.59	5.42	5.67	4.26	5.88	5.04	5.51
Calcium	no criterion	17	14.8	25.9	59.8	89.4	73.5	62.7	38.5	35.1	23.5
Magnesium	no criterion	2.7	2.00	3.23	20.90	69.80	43.2	46.2	23.9	22.4	14.9
Potassium	no criterion		1.52		2.57		2.52			2.36	
Sodium	20/200**	27	18	24.3	32.0	40.4	33.7	37	25.2	27.3	20.5
Iron	0.3**	19	14.2	31.0	85.4	87.6	41.1	32.5	19	16.8	16
Manganese	0.05**		0.719		3.05		2.49			1.01	
Ammonia (total)	no criterion	0.75	1.18	0.50	0.83	1.29	0.68	0.82	0.34	0.39	0.29
Total Kjeldahl Nitrogen	no criterion		0.93		1.11		0.85			1.24	
Nitrite	1*	0.02	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.10	<0.10	<0.05
Nitrate	10*	<0.1	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.10	<0.10	<0.05
DOC	5*		11.4	11.7	5.6	8.1	4.9	34	6.6	8.6	7.9
COD	no criterion		12	65	25	53	25	100	23	26	21
Phenols	no criterion		<0.001		<0.001		<0.001			<0.001	
Boron	5*	0.018	0.012	0.013	0.013	0.015	0.011	<0.010	0.012	0.01	0.012
Phosphate	no criterion				<0.05						
Aluminum	0.10***										
Barium	1*	0.051	0.043	0.077	0.146	0.259	0.129	0.144	0.069	0.065	0.05
Beryllium	no criterion										
Bismuth	no criterion										
Cadmium	0.005*		<0.002		<0.001		<0.001			<0.001	
Chromium	0.05*		<0.003		<0.003		<0.003			<0.003	
Cobalt	no criterion										
Copper	1*	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Lead	0.01*		<0.002		<0.002		<0.002			<0.002	
Molybdenum	no criterion										
Nickel	no criterion										
Phosphorus (total)	no criterion	1.6	<0.05	0.46	<0.05	0.55	0.16	1.39	0.16	0.21	0.18
Silver	no criterion										
Strontium	no criterion										
Titanium	no criterion										
Vanadium	no criterion										
Zinc	5**		0.011	0.016	0.062	0.013	0.084	0.007	<0.005	<0.005	<0.005
Total Dissolved Solids	500**	199	146	216	678	984	616	706	452	368	284
Selenium	no criterion										
Antimony	0.006*										
Mercury	0.001		<0.0001				<0.0001			<0.0001	
Arsenic	0.025*		<0.003				<0.003			<0.003	

NOTES:

- 1) Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
 - 3) * indicates health related ODWSOG.
 - 4) ** indicates aesthetic objective for ODWSOG.
 - 5) *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2	BH10-2
DATE		23-Sep-15	18-May-16	14-Sep-16	24-May-17	22-May-18	15-May-19	13-May-20	13-May-21	5-May-22	10-May-23	1-May-24
pH	6.5 to 8.5***	7.33	6.62	6.74	7.19	6.53	7.05	7.01	6.42	6.69	6.47	6.67
Conductivity	no criterion	392	368	390	278	247	255	219	194	184	176	146
Alkalinity (as CaCO ₃)	30-500**	44	47	59	53	62	63	56	64	61	54	59
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	44	47	59	53	62	63	56	64	61	54	59
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***											
Chloride	250**	87.7	82.5	77.3	50.3	40.3	34.8	32.1	23.4	13.6	14.5	10.7
Sulphate	500**	3.64	4.99	3.37	7.42	6.92	6.69	7.14	6.36	5.21	6.7	3.79
Calcium	no criterion	22.5	19.6	21.6	17.8	14.4	14.2	13.4	11.7	11.8	13.1	7.35
Magnesium	no criterion	12.8	12	10.3	9.07	7.87	7.29	6.86	6.26	5.86	6.46	4.07
Potassium	no criterion	2.2		1.93	1.7	1.47	1.44	1.25	1.18	1.15	1.27	0.6
Sodium	20/200**	21	21.2	21.2	19.3	17.8	18.1	17	15.7	13.8	16.7	8.71
Iron	0.3**	18.4	16.3	28.2	20.6	20.6	28.6	19.6	19.6	24.6	26.1	20.3
Manganese	0.05**	0.877		1.13								
Ammonia (total)	no criterion	0.58	0.4	0.71	0.45	0.38	0.36	0.38	0.33	0.27	0.28	0.33
Total Kjeldahl Nitrogen	no criterion	1		0.93								
Nitrite	1*	<0.05	<0.05	<0.10								
Nitrate	10*	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DOC	5*	10.6	10.1	10.9								
COD	no criterion	27	31	28								
Phenols	no criterion	<0.001		<0.001								
Boron	5*	0.011	<0.010	0.014	0.016	<0.010	0.011	<0.010	<0.010	0.01	<0.010	0.02
Phosphate	no criterion											
Aluminum	0.10***											
Barium	1*	0.054	0.043	0.062	0.041	0.034	0.039	0.032	0.029	0.027	0.027	0.021
Beryllium	no criterion											
Bismuth	no criterion											
Cadmium	0.005*	<0.001		<0.001								
Chromium	0.05*	0.004		<0.003								
Cobalt	no criterion											
Copper	1*	<0.003	<0.003	<0.003								
Lead	0.01*	<0.002		<0.002								
Molybdenum	no criterion											
Nickel	no criterion											
Phosphorus (total)	no criterion	0.09	1.13	0.12								
Silver	no criterion											
Strontium	no criterion											
Titanium	no criterion											
Vanadium	no criterion											
Zinc	5**	<0.005	<0.005	<0.005	0.026	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	500**	238	250	256	172	150	130	144	142	124	24	108
Selenium	no criterion											
Antimony	0.006*											
Mercury	0.001	<0.0001		<0.0001								
Arsenic	0.025*	<0.003		<0.003								

NOTES:

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TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH15-2	BH15-2	BH15-2	BH15-2	BH15-2	BH15-2	BH15-2	BH15-2	BH15-2	BH15-2
DATE		23-Sep-15	18-May-16	14-Sep-16	24-May-17	22-May-18	15-May-19	13-May-20	13-May-21	5-May-22	10-May-23
pH	6.5 to 8.5***	7.29	6.33	6.35	6.5	6.29	6.48	6.66	6.11	6.35	5.95
Conductivity	no criterion	85	47	52	34	42	36	35	38	44	33
Alkalinity (as CaCO ₃)	30-500**	27	11	16	9	17	11	11	15	15	8
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	27	11	16	9	17	11	11	15	15	8
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***										
Chloride	250**	2.36	1.38	1.19	0.87	1.02	0.79	0.9	0.79	0.69	0.86
Sulphate	500**	9.25	5.81	5.48	4.92	4.74	3.92	4.19	3.84	3.44	3.12
Calcium	no criterion	8.12	3.27	4.41	2.64	3.98	3.39	3.22	3.26	5.13	6.74
Magnesium	no criterion	1.32	0.71	0.85	0.55	0.9	0.67	0.67	0.7	1.24	1.88
Potassium	no criterion	1.16	0.58	0.72	0.39	0.5	0.44	0.42	<0.50	0.7	0.69
Sodium	20/200**	4.37	1.75	2.04	1.58	1.61	1.44	1.26	1.44	1.73	1.66
Iron	0.3**	0.369	<0.010	0.07	<0.010	4.91	4.41	<0.010	0.02	0.238	2.52
Manganese	0.05**	0.18	0.024	0.062							
Ammonia (total)	no criterion	0.04	<0.02	0.04	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion	0.2	0.26	<0.10							
Nitrite	1*	<0.05	<0.05	<0.05							
Nitrate	10*	<0.05	0.16	0.24	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DOC	5*	2.6	3.7	3.7							
COD	no criterion	<5	6	<5							
Phenols	no criterion	<0.001	<0.001	<0.001							
Boron	5*	<0.010	<0.010	0.013	0.013	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate	no criterion										
Aluminum	0.10***										
Barium	1*	0.044	0.026	0.035	0.025	0.024	0.03	0.025	0.019	0.025	0.022
Beryllium	no criterion										
Bismuth	no criterion										
Cadmium	0.005*	<0.001	<0.001	<0.001							
Chromium	0.05*	<0.003	<0.003	<0.003							
Cobalt	no criterion										
Copper	1*	<0.003	<0.003	<0.003							
Lead	0.01*	<0.002	<0.002	<0.002							
Molybdenum	no criterion										
Nickel	no criterion										
Phosphorus (total)	no criterion	0.16	0.2	0.24							
Silver	no criterion										
Strontium	no criterion										
Titanium	no criterion										
Vanadium	no criterion										
Zinc	5**	0.006	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	500**	64	38	22	30	28	<20	46	24	<10	10
Selenium	no criterion										
Antimony	0.006*										
Mercury	0.001	<0.0001	<0.0001	<0.0001							
Arsenic	0.025*	<0.003	<0.003	<0.003							

NOTES:

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TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH15-2
DATE		1-May-24
pH	6.5 to 8.5***	6.33
Conductivity	no criterion	42
Alkalinity (as CaCO ₃)	30-500**	17
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	17
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5
Hardness	80-100***	
Chloride	250**	0.65
Sulphate	500**	3.04
Calcium	no criterion	2.56
Magnesium	no criterion	0.64
Potassium	no criterion	0.55
Sodium	20/200**	1.06
Iron	0.3**	0.036
Manganese	0.05**	
Ammonia (total)	no criterion	<0.02
Total Kjeldahl Nitrogen	no criterion	
Nitrite	1*	
Nitrate	10*	<0.05
DOC	5*	
COD	no criterion	
Phenols	no criterion	
Boron	5*	0.012
Phosphate	no criterion	
Aluminum	0.10***	
Barium	1*	0.023
Beryllium	no criterion	
Bismuth	no criterion	
Cadmium	0.005*	
Chromium	0.05*	
Cobalt	no criterion	
Copper	1*	
Lead	0.01*	
Molybdenum	no criterion	
Nickel	no criterion	
Phosphorus (total)	no criterion	
Silver	no criterion	
Strontium	no criterion	
Titanium	no criterion	
Vanadium	no criterion	
Zinc	5**	<0.005
Total Dissolved Solids	500**	18
Selenium	no criterion	
Antimony	0.006*	
Mercury	0.001	
Arsenic	0.025*	

NOTES:

1) Blank indicates data not available.

Standards Objectives and Guidelines (2006).

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5) *** indicates operational guideline for ODWSOG.

or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH15-3	BH15-3	BH15-3	BH15-3	BH15-3	BH15-3	BH15-3	BH15-3	BH15-3	BH15-3
DATE		23-Sep-15	18-May-16	14-Sep-16	24-May-17	22-May-18	15-May-19	13-May-20	13-May-21	5-May-22	10-May-23
pH	6.5 to 8.5***	8.22	7.76	8.17	8.13	7.12	6.95	7.33	7.32	7.19	6.97
Conductivity	no criterion	913	994	1080	838	667	509	441	580	485	433
Alkalinity (as CaCO ₃)	30-500**	260	324	406	247	123	43	67	168	101	86
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	260	324	406	247	123	43	67	168	101	86
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	80-100***										
Chloride	250**	42.7	37.1	33.3	54.9	57.1	31.7	26.5	35.7	40.6	36.4
Sulphate	500**	124	126	90.7	112	136	125	99.8	85.5	67.6	57.8
Calcium	no criterion	49.7	10.5	10.2	15.8	21.6	22.6	18.4	12.6	16.8	18.4
Magnesium	no criterion	11	2.39	1.64	3.18	4.29	4.28	3.32	2.33	3.06	3.13
Potassium	no criterion	4.66	2.29	2.05	2.84	1.61	1.47	1.32	1.22	1.75	1.9
Sodium	20/200**	137	194	224	175	114	63.3	70.8	128	116	104
Iron	0.3**	0.099	0.511	3.7	8.17	0.142	0.273	0.056	0.3	0.806	0.984
Manganese	0.05**	0.181	0.121	0.185							
Ammonia (total)	no criterion	0.14	0.18	0.23	0.15	0.11	0.09	<0.02	0.08	<0.02	<0.02
Total Kjeldahl Nitrogen	no criterion	0.98	1.91	1.2							
Nitrite	1*	<0.25	<0.25	<0.25							
Nitrate	10*	<0.25	1.66	0.55	4.81	1.75	2.23	1.38	0.64	0.24	0.3
DOC	5*	16.2	38.8	50.1							
COD	no criterion	53	71	97							
Phenols	no criterion	<0.001	0.007	<0.001							
Boron	5*	0.089	0.187	0.271	0.287	0.301	0.32	0.281	0.371	0.3	0.279
Phosphate	no criterion										
Aluminum	0.10***										
Barium	1*	0.064	0.044	0.063	0.109	0.034	0.04	0.036	0.023	0.039	0.038
Beryllium	no criterion										
Bismuth	no criterion										
Cadmium	0.005*	<0.001	<0.001	<0.001							
Chromium	0.05*	<0.003	<0.003	0.004							
Cobalt	no criterion										
Copper	1*	<0.003	0.024	0.063							
Lead	0.01*	<0.002	<0.002	0.005							
Molybdenum	no criterion										
Nickel	no criterion										
Phosphorus (total)	no criterion	3.89	4.6	2.96							
Silver	no criterion										
Strontium	no criterion										
Titanium	no criterion										
Vanadium	no criterion										
Zinc	5**	0.009	0.007	0.016	0.022	0.006	<0.005	<0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	500**	512	1000	2050	1830	442	298	300	454	272	128
Selenium	no criterion										
Antimony	0.006*										
Mercury	0.001	<0.0001	<0.0001	<0.0001							
Arsenic	0.025*	<0.003	<0.003	<0.003							

NOTES:

- 1) Blank indicates data not available.
 - Standards Objectives and Guidelines (2006).
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 - 5) *** indicates operational guideline for ODWSOG.
- or does not meet ODWSOG.

TABLE E-2
GENERAL CHEMICAL RESULTS - GROUNDWATER
TRI-R COMMITTEE LANDFILL

PARAMETER	ODWSOG	BH15-3
DATE		1-May-24
pH	6.5 to 8.5***	7.27
Conductivity	no criterion	430
Alkalinity (as CaCO ₃)	30-500**	134
Bicarbonate Alkalinity (as CaCO ₃)	no criterion	134
Carbonate Alkalinity (as CaCO ₃)	no criterion	<5
Hardness	80-100***	
Chloride	250**	33.6
Sulphate	500**	52.4
Calcium	no criterion	13.7
Magnesium	no criterion	2.78
Potassium	no criterion	1.04
Sodium	20/200**	97.6
Iron	0.3**	0.086
Manganese	0.05**	
Ammonia (total)	no criterion	0.02
Total Kjeldahl Nitrogen	no criterion	
Nitrite	1*	
Nitrate	10*	0.18
DOC	5*	
COD	no criterion	
Phenols	no criterion	
Boron	5*	0.305
Phosphate	no criterion	
Aluminum	0.10***	
Barium	1*	0.023
Beryllium	no criterion	
Bismuth	no criterion	
Cadmium	0.005*	
Chromium	0.05*	
Cobalt	no criterion	
Copper	1*	
Lead	0.01*	
Molybdenum	no criterion	
Nickel	no criterion	
Phosphorus (total)	no criterion	
Silver	no criterion	
Strontium	no criterion	
Titanium	no criterion	
Vanadium	no criterion	
Zinc	5**	<0.005
Total Dissolved Solids	500**	250
Selenium	no criterion	
Antimony	0.006*	
Mercury	0.001	
Arsenic	0.025*	

NOTES:

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- or does not meet ODWSOG.

FIGURE E-1
TIME CONCENTRATION GRAPH - Chloride

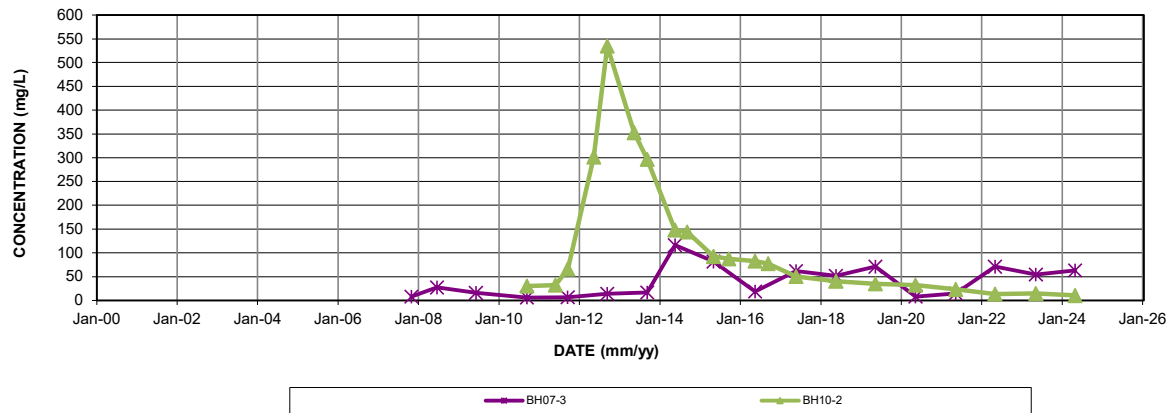


FIGURE E-2
TIME CONCENTRATION GRAPH - Iron

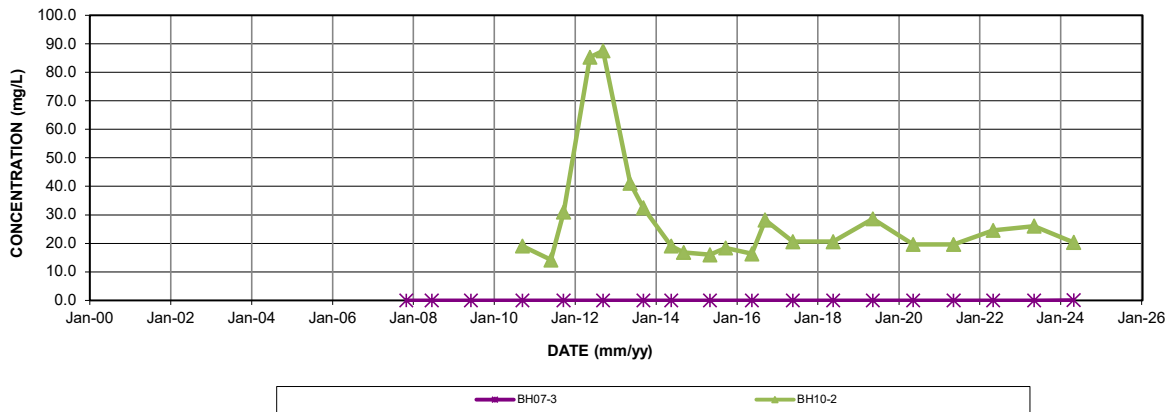


FIGURE E-3
TIME CONCENTRATION GRAPH - Ammonia

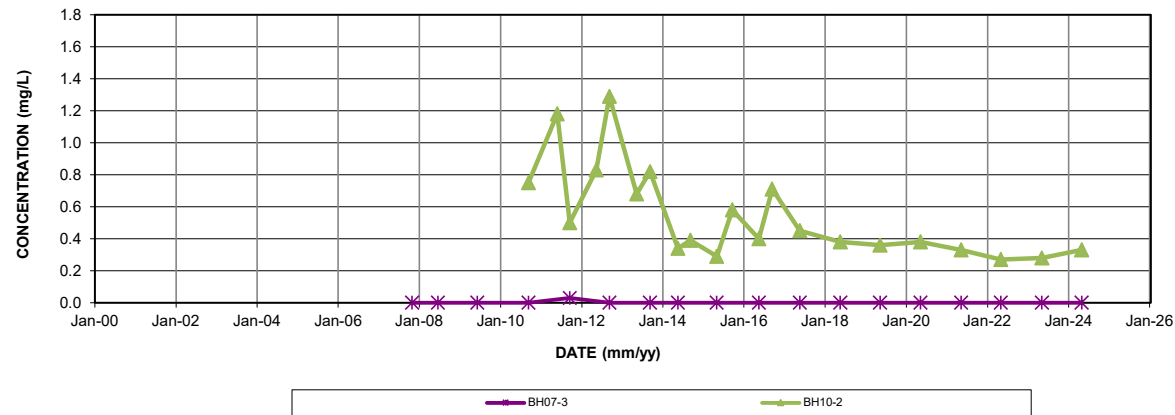
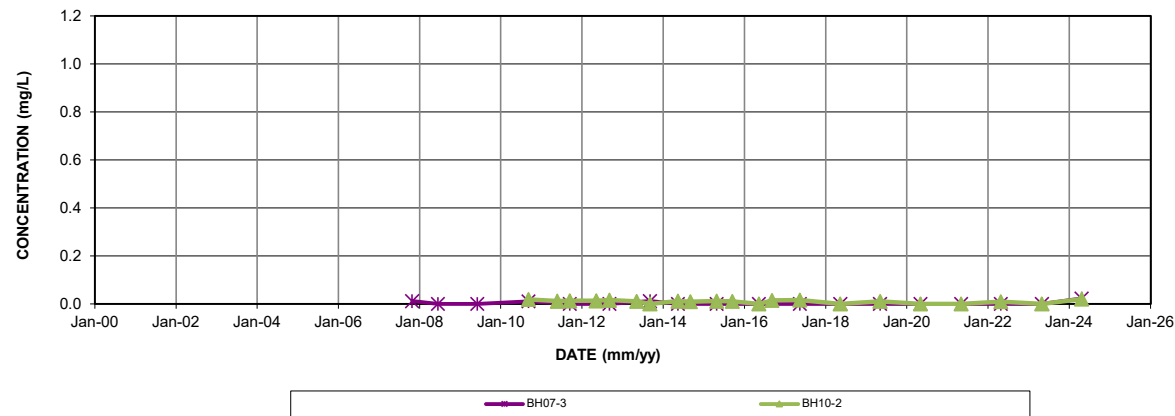
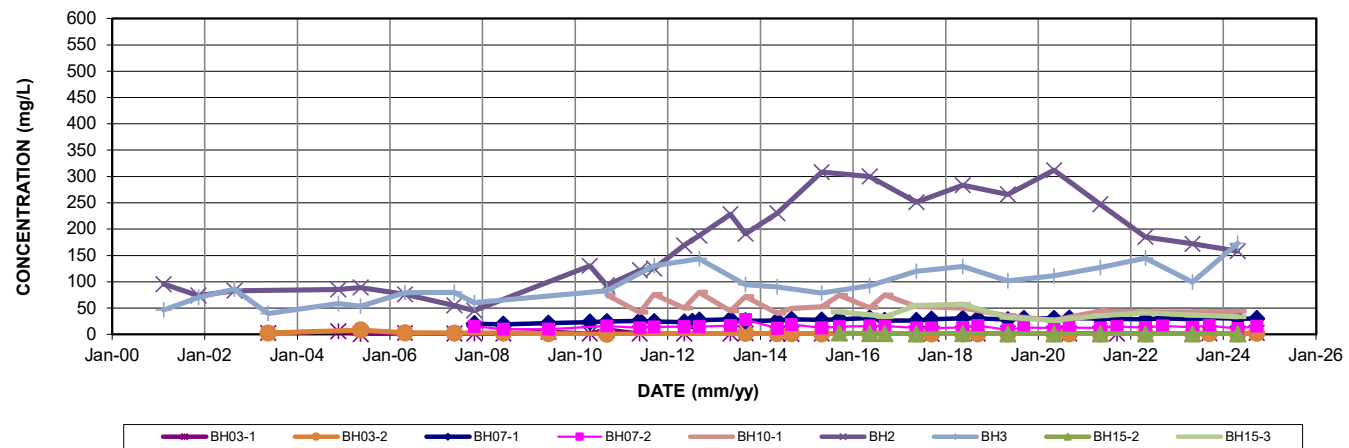


FIGURE E-4
TIME CONCENTRATION GRAPH - Boron



**FIGURE E-5
TIME CONCENTRATION GRAPH - Chloride**



**FIGURE E-6
TIME CONCENTRATION GRAPH - Iron**

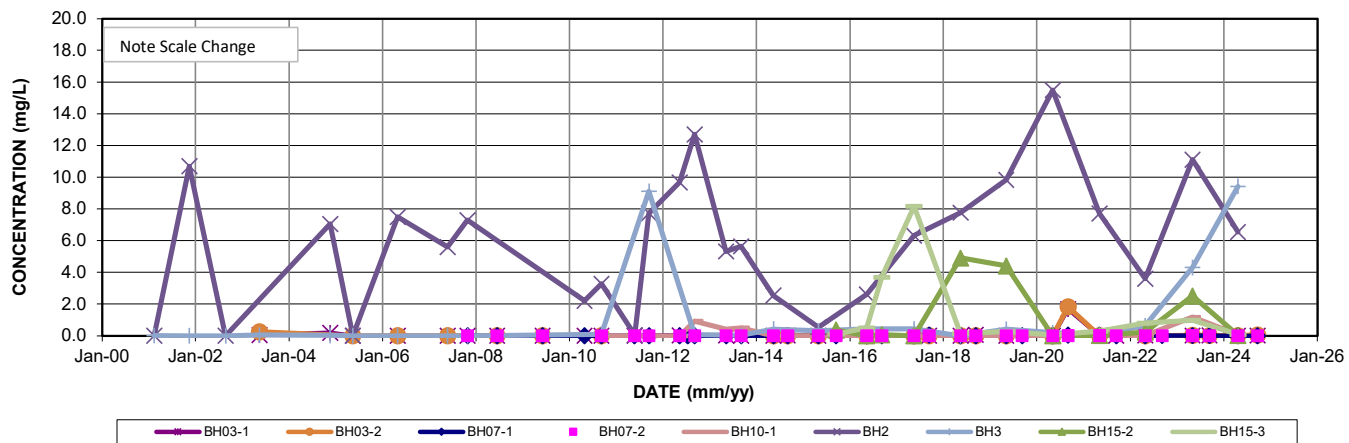


FIGURE E-7
TIME CONCENTRATION GRAPH - Total Ammonia

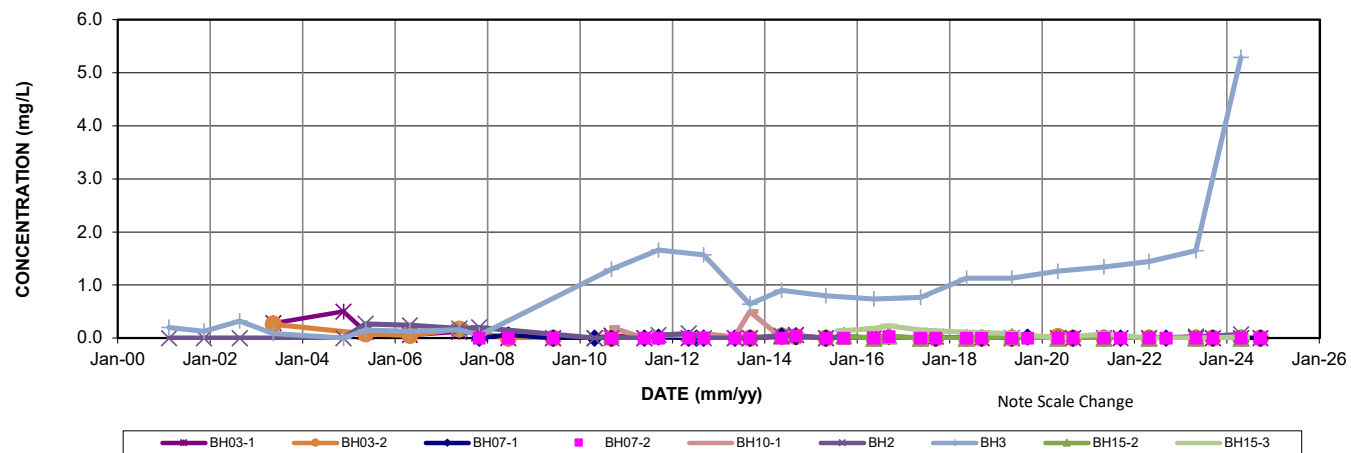
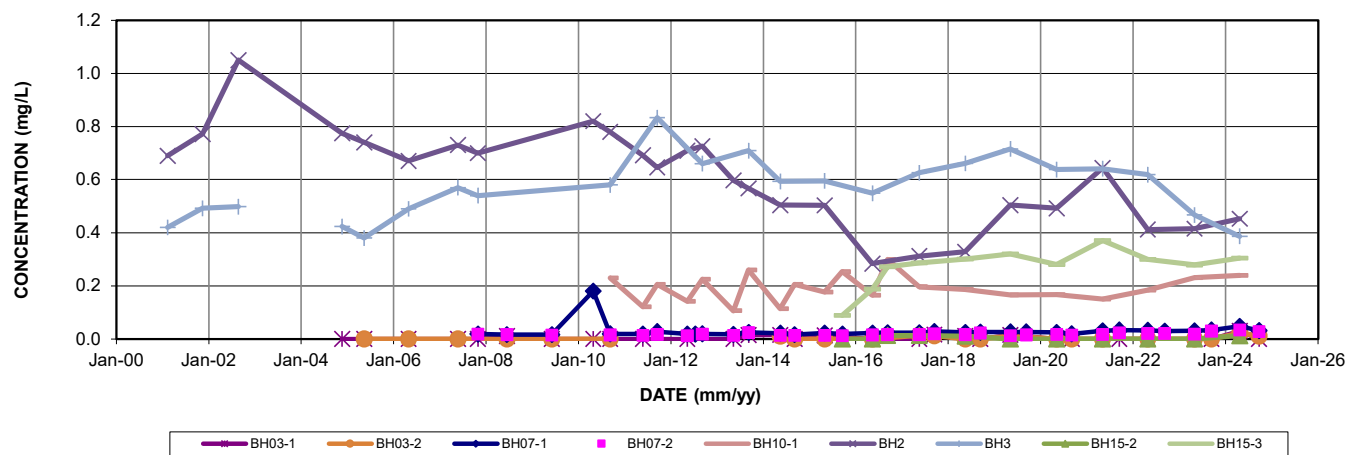


FIGURE E-8
TIME CONCENTRATION GRAPH - Boron



Appendix F

Surface Water Chemical Results

- Field Chemical Results – Surface Water – Table F-1
 - General Chemical Results – Surface Water – Table F-2
 - Time-Concentration Graphs – Figures F-1 to F-7
 - Distance-Concentration Graphs – Figures F-8 to F11
-

TABLE F-1
FIELD CHEMICAL RESULTS - SURFACE WATER
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	SW1	SW1	SW1
	DATE	1-May-24	30-Sep-24	30-Nov-24
Temperature	C	9.6	21.2	SNOW/ICE
pH	pH units	7.29	6.23	
Conductivity	uS/cm	42	8.2	
Dissolved Oxygen	mg/L	10.06	8.32	
Turbidity	NTU	4.42	7.52	
Flow Rate	L/s	NM	NM	

PARAMETER	UNITS	SW2	SW2	SW2
	DATE	1-May-24	30-Sep-24	30-Nov-24
Temperature	C	9.5	21.2	SNOW/ICE
pH	pH units	6.77	6.2	
Conductivity	uS/cm	41	68	
Dissolved Oxygen	mg/L	10.45	8.64	
Turbidity	NTU	3.67	5.5	
Flow Rate	L/s	NM	NM	

PARAMETER	UNITS	S1	S1	S1	S1	S1	S1	S1
	DATE	1-May-24	1-Jun-24	1-Jul-24	1-Aug-24	30-Sep-24	1-Oct-24	30-Nov-24
Temperature	C	LOW FLOW	NM	NM	NM	NO FLOW	NM	SNOW/ICE
pH	pH units							
Conductivity	uS/cm							
Dissolved Oxygen	mg/L							
Turbidity	NTU							
Flow Rate	L/s							

PARAMETER	UNITS	S2	S2	S2	S2	S2	S2	S2
	DATE	1-May-24	1-Jun-24	1-Jul-24	1-Aug-24	30-Sep-24	1-Oct-24	30-Nov-24
Temperature	C	9.70	NM	NM	NM	18.5	NM	SNOW/ICE
pH	pH units	6.94				6.58		
Conductivity	uS/cm	53				114		
Dissolved Oxygen	mg/L	9.84				9.2		
Turbidity	NTU	6.89				3.52		
Flow Rate	L/s	39				63		

PARAMETER	UNITS	S4	S4	S4	S4	S4	S4	S4
	DATE	10-Jan-00	1-Jun-24	1-Jul-24	1-Aug-24	30-Sep-24	1-Oct-24	30-Nov-24
Temperature	C	10.30	NM	NM	NM	17.7	NM	SNOW/ICE
pH	pH units	7.17				6.61		
Conductivity	uS/cm	58				121		
Dissolved Oxygen	mg/L	9.91				9.46		
Turbidity	NTU	8.58				5.29		
Flow Rate	L/s	36				94		

TABLE F-1
FIELD CHEMICAL RESULTS - SURFACE WATER
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	S5	S5	S5	S5	S5	S5	S5
	DATE	1-May-24	1-Jun-24	1-Jul-24	1-Aug-24	30-Sep-24	1-Oct-24	30-Nov-24
Temperature	C	10.2						
pH	pH units	7.04						
Conductivity	uS/cm	101	NM	NM	NM	DRY	NM	SNOW/ICE
Dissolved Oxygen	mg/L	7.32						
Turbidity	NTU	3.58						
Flow Rate	L/s	2						

PARAMETER	UNITS	S6	S6	S6	S6	S6	S6	S6
	DATE	1-May-24	1-Jun-24	1-Jul-24	1-Aug-24	30-Sep-24	1-Oct-24	30-Nov-24
Temperature	C	8.9						
pH	pH units	7						
Conductivity	uS/cm	368	NM	NM	NM	NO FLOW	NM	SNOW/ICE
Dissolved Oxygen	mg/L	9.23						
Turbidity	NTU	5.84						
Flow Rate	L/s	1						

PARAMETER	UNITS	S7	S7	S7	S7	S7	S7	S7
	DATE	1-May-24	1-Jun-24	1-Jul-24	1-Aug-24	30-Sep-24	1-Oct-24	30-Nov-24
Temperature	C	9.9				2.2		
pH	pH units	7.01				6.72		
Conductivity	uS/cm	34	NM	NM	NM	62	NM	SNOW/ICE
Dissolved Oxygen	mg/L	9.88				9.31		
Turbidity	NTU	5.07				3.04		
Flow Rate	L/s	83				68		

PARAMETER	UNITS	S8	S8	S8	S8	S8	S8	S8
	DATE	1-May-24	1-Jun-24	1-Jul-24	1-Aug-24	30-Sep-24	1-Oct-24	30-Nov-24
Temperature	C							
pH	pH units							
Conductivity	uS/cm	NO FLOW	NM	NM	NM	DRY	NM	SNOW/ICE
Dissolved Oxygen	mg/L							
Turbidity	NTU							
Flow Rate	L/s							

PARAMETER	UNITS	S9	S9	S9	S9	S9	S9	S9
	DATE	1-May-24	1-Jun-24	1-Jul-24	1-Aug-24	30-Sep-24	1-Oct-24	30-Nov-24
Temperature	C	8.4						
pH	pH units	7.24						
Conductivity	uS/cm	203	NM	NM	NM	NO FLOW	NM	SNOW/ICE
Dissolved Oxygen	mg/L	10.1						
Turbidity	NTU	7.35						
Flow Rate	L/s	4						

NOTES:

- 1) C denotes Celsius.
- 2) mS/cm denotes millisiemens per centimetre.
- 3) NTU denotes nephelometric units.
- 4) mg/L denotes milligrams per litre.
- 5) L/s denotes litres per second.
- 6) EF indicates Equipment Failure or anomalous result.
- 7) NM indicates not measured.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S1	S1	S1	S1	S1	S1	S1	S1	S1	S1
SAMPLING DATE			9-Jun-09	16-Jul-09	20-Aug-09	17-Sep-09	15-Oct-09	19-Nov-09	3-May-10	1-Jun-10	13-Jul-10	12-Aug-10
pH	pH units	6.5 - 8.5	8.1	8.1	8.1	8	7.8	7.9	8.0	8.0	7.9	7.8
Conductivity	µS/cm		1330	1300	1190	1130	1330	1260	1280	1290	1220	1110
Alkalinity (as CaCO ₃)	mg/L		540	538	509	490	563	474	506	536	482	461
Bicarbonate Alkalinity (as CaCO ₃)	mg/L								501	532	479	458
Carbonate Alkalinity (as CaCO ₃)	mg/L								5	5	4	3
Hardness	mg/L		380	390	370	350	410	370	380	400	360	360
Chloride	mg/L		76	75	76	65	84	85	82	74	80	69
Sulphate	mg/L		29	36	27	32	37	72	45	34	44	26
Calcium	mg/L		102	103	97.6	91.5	106	99.7	105	120	110	96.0
Magnesium	mg/L		30.4	32.1	30.7	29.9	35.5	29.9	29.7	33	34	30
Potassium	mg/L		45	41	38	36	38	34	40	42	44	36
Sodium	mg/L		90.3	79	80.8	64	71.4	65	74.3	68	77	62
Iron	mg/L	0.300	11.00	4.00	3.80	8.90	10.00	35	25	86	20	17
Manganese	mg/L		2.80	3.80	3.30	<0.001	5.20	<0.001	3.2	5.1	3.9	4.4
Ammonia (total)	mg/L		23	20	17	16	21	18	17	20	17	17
Ammonia (unionized)	mg/L	0.02	0.21	0.25	0.02	0.07	0.06	0.02	0.1	0.12	0.04	0.03
Total Kjeldahl Nitrogen	mg/L								22	19	17	
Nitrite	mg/L		0.22	0.28	0.31	0.14	0.03	0.09	0.28	1.7	0.08	0.07
Nitrate	mg/L		9	2.7	3.1	0.7	0.8	0.4	0.9	1	0.3	0.2
DOC	mg/L			32.2					29.7	35.1	30.4	28.1
COD	mg/L									120	87	86
Phenols	mg/L	0.001							<0.001	<0.001	0.001	<0.001
Boron	mg/L	0.200*	1.5	1.2	1.2	0.84	0.84	0.88	1.1	1.1	1	0.81
Phosphate	mg/L		<0.01	<0.05	<0.05	<0.01	<0.01	<0.01				
Aluminum	mg/L	0.075*	0.0015	0.36	0.26	0.35	0.058	0.99				
Barium	mg/L		2.2	0.23	0.21	0.27	0.25	0.39	0.41	0.8	0.42	0.39
Beryllium	mg/L	0.011*	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				
Bismuth	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005
Cobalt	mg/L	0.0009	0.0033	0.0023	0.0024	0.0022	0.002	0.0024				
Copper	mg/L	0.005	0.004	0.002	0.002	<0.001	<0.001	0.002	0.002	0.007	0.001	<0.001
Lead	mg/L	0.003*	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	0.0023	<0.0005	<0.0005
Molybdenum	mg/L	0.040*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Nickel	mg/L	0.025	0.007	0.004	0.004	0.002	0.003	0.003				
Phosphorus (total)	mg/L	0.030*	0.31	0.036	0.04	0.035	0.012	0.16	0.037	0.20	0.021	0.032
Silver	mg/L	0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Strontium	mg/L		0.74	0.71	0.66	0.64	0.68	0.64				
Vanadium	mg/L	0.006*	0.005	0.002	0.002	0.002	0.001	0.004				
Zinc	mg/L	0.020*	0.029	0.005	0.006	0.006	<0.005	0.011	0.008	0.028	0.009	<0.005
Total Dissolved Solids	mg/L			740				712			692	634
Selenium	mg/L	0.100	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002				
Antimony	mg/L	0.020*	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				
Mercury	mg/L	0.0002							<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BOD5	mg/L											
Total Suspended Solids	mg/L											

NOTES:

- 1) Blank indicates data not available.
- and updates.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S1	S1	S1	S1	S1	S1	S1	S1	S1	S1
SAMPLING DATE			14-Sep-10	19-Oct-10	15-Nov-10	30-May-11	13-Jul-11	25-Aug-11	21-Sep-11	27-Oct-11	17-Nov-11	16-May-12
pH	pH units	6.5 - 8.5	7.8	7.8	7.67	7.32	7.8	8.26	8.29	7.78	8.04	8.07
Conductivity	µS/cm		1290	1370	747	530	864	994	926	674	984	754
Alkalinity (as CaCO ₃)	mg/L		484	496	191	185	336	399	422	193	253	265
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		481	493	190	185	336	399	422	193	253	265
Carbonate Alkalinity (as CaCO ₃)	mg/L		3	3	<1	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L		390	420	210							
Chloride	mg/L		83	99	48	44.5	76.2	81.2	89.4	72.3	96.8	66.7
Sulphate	mg/L		71	69	91	30.5	20.9	59.3	44.2	77.2	98.7	21.7
Calcium	mg/L		120	130	70	46.9	75.6	87.3	95.4	60.6	79.1	67.0
Magnesium	mg/L		41	39	21	12.1	23.1	26.7	32.3	17.4	23.6	19.1
Potassium	mg/L		44	44	20	13.3	30.1	28.5	31.1	15.4	20.7	18.3
Sodium	mg/L		82.0	84.0	45	33.8	56.3	58.3	66.5	47.5	65.1	49.4
Iron	mg/L	0.300	26	22	26	8.07	19.2	13.3	11.2	10.5	16.3	11.6
Manganese	mg/L		5.6	7.1	2.8	2.22	5.31	4.46	5.6	2.89	4.33	3.62
Ammonia (total)	mg/L		16	18	7.7	0.07	10.8	13.5	14.6	5.53	8.37	<0.05
Ammonia (unionized)	mg/L	0.02	0.06	<0.02	<0.02	<0.02	0.062	0.358	0.045	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		19	21	9	7.26	11.9	14.5	16.2	6.35	9.28	3.31
Nitrite	mg/L		0.03	0.01	0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.3	0.6	0.9	0.85	<0.05	0.54	<0.05	0.18	<0.05	<0.05
DOC	mg/L		29.9	26.1	14.2	21.1	31.4	34.2	38.9	15.8	22.6	31
COD	mg/L		95	73	74	41	64	73	85	41	51	7.09
Phenols	mg/L	0.001	<0.001	<0.001	0.006	0.008	0.006	0.003	0.001	<0.001	<0.001	0.001
Boron	mg/L	0.200*	1.0	0.84	0.45	0.306	0.47	0.591	0.587	0.346	0.503	0.379
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.42	0.3	0.31	0.134	0.25	0.293	0.295	0.172	0.242	0.183
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002
Chromium	mg/L	0.01	<0.005	<0.005	0.01	<0.003	<0.003	<0.003	0.004	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.001	<0.001	0.01	0.005	0.008	0.008	0.008	0.004	0.004	<0.003
Lead	mg/L	0.003*	<0.0005	<0.0005	0.0042	<0.001	<0.001	0.002	0.002	<0.001	<0.001	<0.002
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.046	0.012	0.34	0.07	0.05	0.03	0.03	<0.02	<0.02	20.2
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	<0.005	0.035	0.013	0.014	0.014	0.026	0.037	<0.005	0.063
Total Dissolved Solids	mg/L		730	774	426	324	532	634	698	416	584	420
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L											
Total Suspended Solids	mg/L											

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S1	S1	S1	S1	S1	S1	S1	S1	S1	S1
SAMPLING DATE			13-Jun-12	18-Jul-12	23-Aug-12	13-Sep-12	17-Oct-12	15-Nov-12	13-May-13	10-Jun-13	11-Jul-13	13-Aug-13
pH	pH units	6.5 - 8.5	7.74	8.19	7.98	7.85	7.82	7.58	7.81	7.37	8.36	7.48
Conductivity	µS/cm		1000	960	1010	1240	505	410	461	648	953	1320
Alkalinity (as CaCO ₃)	mg/L		381	387	427	414	124	115	140	223	337	464
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		381	387	427	414	124	115	140	223	324	464
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	13	<5
Hardness	mg/L											
Chloride	mg/L		83.1	90.4	101	130	52.5	49	54.1	60.4	98.3	105
Sulphate	mg/L		38.6	44.9	61.6	156	68.1	30.4	14.4	11.2	42.1	36.5
Calcium	mg/L		81.8	86.4	100	111	48.3	35.6	41.9	53.5	89.8	92.5
Magnesium	mg/L		24.7	27.0	33.2	32.8	12.7	9.21	11.2	14.7	26.4	29.7
Potassium	mg/L		23.7	26.7	31.7	33.4	13	8.49	10.6	14.4	27.3	29.3
Sodium	mg/L		61.1	67.7	75.9	87.2	40.6	32.1	31.5	39.9	67.8	71
Iron	mg/L	0.300	27.4	9.78	19.1	18.1	9.1	7.63	9.77	12.3	26.6	16.1
Manganese	mg/L		5.57	5.43	5.80	6.03	2.02	1.5	1.84	3.17	6.23	5.54
Ammonia (total)	mg/L		9.96	13.1	12.5	12.5	2.73	2.54	3.03	4.44	11.5	12.8
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		11.9	20.9	15.1	15.2	4.11	3.17	3.57	51	13	13.1
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.10	<0.10	<0.25	<0.25
Nitrate	mg/L		0.08	<0.05	0.16	0.43	<0.05	<0.05	<0.10	<0.10	<0.25	<0.25
DOC	mg/L		28.1	25.3	25.2	32.1	20.5	14.1	14.3	6.17	23.4	24.4
COD	mg/L		70	68	68	87	69	48	37	19.7	65	68
Phenols	mg/L	0.001	0.002	<0.001	<0.001	0.001	0.002	0.001	<0.001	<0.001	<0.001	0.001
Boron	mg/L	0.200*	0.484	0.578	0.569	0.765	0.21	0.17	0.235	0.314	0.579	0.619
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.258	0.243	0.305	0.347	0.134	0.096	0.112	0.144	0.291	0.286
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	0.0027	<0.0001	<0.0001	<0.002	<0.0001	<0.0001	<0.002	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	0.006	0.007	<0.003	0.005	<0.003	0.004	<0.003	0.004
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	0.003	<0.002	<0.002	<0.003	0.006	0.003	<0.003	0.002	<0.002	<0.002
Lead	mg/L	0.003*	0.001	<0.001	<0.001	<0.002	0.002	0.001	<0.002	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.06	0.05	<0.02	0.03	0.059	0.06	<0.05	0.04	0.03	0.04
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.473	0.027	0.010	0.007	0.025	0.008	0.008	0.02	0.013	0.006
Total Dissolved Solids	mg/L		568	598	702	838	332	290	254	356	612	624
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L											
Total Suspended Solids	mg/L											

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S1	S1	S1	S1	S1	S1	S1	S1	S1	S1
SAMPLING DATE			9-Sep-13	29-Oct-13	26-Nov-13	21-May-14	18-Jun-14	20-Aug-14	10-Sep-14	15-Oct-14	12-Nov-14	06-May-15
pH	pH units	6.5 - 8.5	7.61	7.55	7.69	7.75	7.72	7.93	7.73	7.44	7.84	7.82
Conductivity	µS/cm		1020	396	989	369	299	1110	1600	845	559	550
Alkalinity (as CaCO ₃)	mg/L		403	97	269	106	88	272	404	163	150	163
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		403	97	269	106	88	272	404	163	150	163
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		113	40.1	117	39.4	26.7	105	190	76.4	48.8	56.1
Sulphate	mg/L		63	35.2	77.7	8.91	19.3	72.4	134	147	49.6	24.7
Calcium	mg/L		95.6	32.9	77.3							
Magnesium	mg/L		29.4	8.85	18.8							
Potassium	mg/L		28.8	8.12	21							
Sodium	mg/L		78.6	28.6	75.8							
Iron	mg/L	0.300	9.04	1.79	13.9	6.91	3.68	8.31	13.2	17.2	3.49	3.41
Manganese	mg/L		5.72	1.01	4.08							
Ammonia (total)	mg/L		9.7	1.66	5.44	1.39	0.74	6.5	12.2	1.33	2.13	3.18
Ammonia (unionized)	mg/L	0.02	0.028	<0.02	<0.02	<0.02	<0.02	<0.02	0.126	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		9.82	2.91	6.5	1.51	1.58	7.27	13	6.01	3.34	3.92
Nitrite	mg/L		<0.50	<0.05	<0.25	<0.05	<0.05	<0.25	<0.25	<0.25	<0.05	<0.05
Nitrate	mg/L		<0.50	0.06	<0.25	0.19	<0.05	0.38	<0.25	0.31	0.27	0.3
DOC	mg/L		29.6	11.9	24.1							
COD	mg/L		73	39	65	30	43	64	86	130	37	29
Phenols	mg/L	0.001	<0.001	0.001	0.002	<0.001	<0.001	<0.001	0.006	0.003	<0.001	<0.001
Boron	mg/L	0.200*	0.66	0.162	0.509	0.139	0.112	0.481	0.692	0.515	0.426	0.256
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.281	0.076	0.2	0.099	0.061	0.194	0.316	0.24	0.073	0.1
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0005	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.011	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.003	0.002	0.002	<0.002	0.006	0.003	<0.002	0.024	0.004	<0.002
Lead	mg/L	0.003*	<0.002	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.009	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	<0.05	0.05	0.03	0.04	0.06	0.03	<0.02	0.37	0.08	0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	<0.005	0.015	<0.005	0.01	<0.005	<0.005	0.059	0.006	<0.005
Total Dissolved Solids	mg/L		690	250	640	222	210	586	978	544	346	292
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L					<5	<5	<5	<5	<5	<5	<5
Total Suspended Solids	mg/L											11

NOTES:

- 1) Blank indicates data not available.
- and updates.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S1	S1	S1	S1	S1	S1	S1
SAMPLING DATE			10-Jun-15	23-Sep-15	18-May-16	22-May-18	05-May-22	08-Nov-23	01-May-24
pH	pH units	6.5 - 8.5	7.59	7.9	7.85	7.95	7.64	7.71	7.5
Conductivity	µS/cm		360	1240	481	1080	938	1910	878
Alkalinity (as CaCO ₃)	mg/L		123	410	166	416	329	689	381
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		123	410	166	416	329	689	381
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L								
Chloride	mg/L		30	112	41.6	96	70.5	162	27.9
Sulphate	mg/L		13.4	23.5	29	69.6	46.1	220	51
Calcium	mg/L			97.8		99.1	88.3	207	103
Magnesium	mg/L			30.7		25	23.2	47.8	17.3
Potassium	mg/L			32.6		30	22.7	69.9	21.5
Sodium	mg/L			78.4		74.2	68.5	144	41.3
Iron	mg/L	0.300	11.3	16.1	8.91	1.5	1.36	37.3	6.2
Manganese	mg/L			5.94					
Ammonia (total)	mg/L		2.23	12.4	2.64	9.5	3.41	11.1	6.27
Ammonia (unionized)	mg/L	0.02	<0.02	0.02	0.01	0.02	<0.02	0.02	0.04
Total Kjeldahl Nitrogen	mg/L		3.58	13.7	3.62	9.71	21.7	13.7	7.25
Nitrite	mg/L		<0.05	<0.10	<0.05	<0.25	<0.05	<0.05	<0.05
Nitrate	mg/L		0.35	0.29	0.06	1.53	1.52	<0.07	0.33
DOC	mg/L			22.8		25.8	23.5	81.6	22
COD	mg/L		53	68	37	49	55	437	61
Phenols	mg/L	0.001	0.002	<0.001	<0.001	0.002	0.01	0.04	0.001
Boron	mg/L	0.200*	0.289	0.599	0.315	0.89	0.707	1.71	1.1
Phosphate	mg/L								
Aluminum	mg/L	0.075*							
Barium	mg/L		0.131	0.239	0.112	0.125	0.14	0.397	0.149
Beryllium	mg/L	0.011*							
Bismuth	mg/L								
Cadmium	mg/L	0.0001*	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	0.006	<0.003	0.008	<0.003	0.008	0.003
Cobalt	mg/L	0.0009							
Copper	mg/L	0.005	0.004	<0.003	0.005	0.003	0.004	0.004	<0.002
Lead	mg/L	0.003*	0.001	<0.002	0.001	<0.001	<0.001	<0.001	0.0006
Molybdenum	mg/L	0.040*							
Nickel	mg/L	0.025							
Phosphorus (total)	mg/L	0.030*	0.03	<0.05	0.04	0.03	<0.02	0.17	0.04
Silver	mg/L	0.0001							
Strontium	mg/L								
Vanadium	mg/L	0.006*							
Zinc	mg/L	0.020*	0.009	<0.005	0.008	<0.005	<0.020	<0.020	<0.020
Total Dissolved Solids	mg/L		348	602	272	594	528	1310	490
Selenium	mg/L	0.100							
Antimony	mg/L	0.020*							
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		6		<5	5	<2	31	<2
Total Suspended Solids	mg/L		77		11	20	<10	72	19

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2
SAMPLING DATE			27-Aug-02	29-Oct-07	19-Jun-08	24-Sep-08	9-Jun-09	16-Jul-09	20-Aug-09	17-Sep-09	15-Oct-09	19-Nov-09
pH	pH units	6.5 - 8.5	7.68	7.2	7.7	8.1	8	8.2	8.1	8.1	8.1	8.1
Conductivity	µS/cm		168.4	98	231	1100	770	1120	962	1050	1140	1160
Alkalinity (as CaCO ₃)	mg/L		54	17	36	371	135	415	364	407	452	421
Bicarbonate Alkalinity (as CaCO ₃)	mg/L											
Carbonate Alkalinity (as CaCO ₃)	mg/L		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness	mg/L		52.7	30	52	370	280	360	310	350	370	350
Chloride	mg/L		12.0	10	41	70	55	67	60	65	71	73
Sulphate	mg/L		12.1	11	10	99	170	48	37	49	54	86
Calcium	mg/L		13.5	9	17	93	82.1	96	82.5	92.8	97.3	96.6
Magnesium	mg/L		4.58	0.11	2.4	29	17.2	28.9	25.1	29.8	31.2	26.9
Potassium	mg/L		4.5	1.9	1.3	30	17	34	29	34	31	29
Sodium	mg/L		9.8	4.8	20	62	39.4	71.8	64.8	62.2	68.4	63.3
Iron	mg/L	0.300	0.19	0.81	1	0.38	0.29	0.24	1.2	0.069	0.22	3.4
Manganese	mg/L		0.080	0.110	0.19	0.43	0.063	1.6	1.5	3.7	2.8	2.3
Ammonia (total)	mg/L		<0.03	<0.05	<0.05	3	<0.05	8.5	5.7	7.6	11	14
Ammonia (unionized)	mg/L	0.02	<0.02	<0.03	<0.02	<0.02	<0.02	0.09	0.22	0.21	0.21	0.12
Total Kjeldahl Nitrogen	mg/L											
Nitrite	mg/L		<0.2	<0.01	0.01	0.18	<0.01	0.11	0.27	0.17	0.03	0.04
Nitrate	mg/L		<0.2	0.1	0.2	6.4	0.7	10	5.9	5.8	2.8	2.3
DOC	mg/L		3.4					24.6				
COD	mg/L											
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.088	0.023	0.037	0.79	0.45	1.1	0.92	0.71	0.86	0.96
Phosphate	mg/L		<1	0.03	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01
Aluminum	mg/L	0.075*	0.068	0.32	0.59	0.2	0.24	0.13	0.26	0.26	0.027	1.2
Barium	mg/L		0.032	0.034	0.069	0.098	0.07	0.12	0.1	0.11	0.12	0.15
Beryllium	mg/L	0.011*	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	mg/L	0.0009	0.0002	<0.0005	0.0008	0.0012	<0.0005	0.0017	0.0016	0.0013	0.0014	0.0021
Copper	mg/L	0.005	0.0010	0.001	0.001	0.003	0.003	0.002	0.003	0.001	<0.001	0.003
Lead	mg/L	0.003*	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0009
Molybdenum	mg/L	0.040*	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L	0.025	<0.001	<0.001	0.001	0.003	<0.001	0.004	0.004	0.002	0.003	0.004
Phosphorus (total)	mg/L	0.030*	<0.05	0.035	0.038	0.018	0.024	0.019	0.033	0.035	0.006	0.061
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	0.011	<0.001	<0.001	<0.001	<0.001
Strontium	mg/L		0.107				0.47	0.68	0.55	0.61	0.065	0.67
Vanadium	mg/L	0.006*	<0.0005	<0.001	0.001	<0.001	<0.001	0.001	0.001	0.001	<0.001	0.003
Zinc	mg/L	0.020*	0.006	0.008	0.012	0.009	<0.005	<0.005	0.012	<0.005	<0.005	0.012
Total Dissolved Solids	mg/L		85					662				670
Selenium	mg/L	0.100	<0.002	<0.002	<0.0002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Antimony	mg/L	0.020*	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	0.001	<0.0005	<0.0005
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.002	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BOD5	mg/L											
Total Suspended Solids	mg/L											

NOTES:

- 1) Blank indicates data not available.
- and updates.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2
SAMPLING DATE			3-May-10	1-Jun-10	13-Jul-10	12-Aug-10	14-Sep-10	19-Oct-10	15-Nov-10	30-May-11	13-Jul-11	25-Aug-11
pH	pH units	6.5 - 8.5	7.2	7.7	7.6	7.0	7.4	7.4	7.50	6.57	7.09	7.26
Conductivity	µS/cm		83	150	261	63	125	84	138	47	62	71
Alkalinity (as CaCO ₃)	mg/L		21	48	84	16	30	22	30	6	17	13
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		20	48	83	16	30	22	30	6	17	13
Carbonate Alkalinity (as CaCO ₃)	mg/L		<1	<1	<1	<1	<1	<1	<1	<5	<5	<5
Hardness	mg/L		24	45	79	20	37	28	39			
Chloride	mg/L		7	9	18	5	12	7	11	4.24	4.59	6.37
Sulphate	mg/L		7	7	14	4	10	7	16	7.17	3.3	6.98
Calcium	mg/L		6.88	15	32	6.1	11	9	14	4.45	6.39	6.94
Magnesium	mg/L		1.60	3.8	9.9	1.4	3.1	2.5	3.9	0.97	1.51	1.66
Potassium	mg/L		2	4.1	11	1	2.5	2.1	3	0.7	1.05	1.12
Sodium	mg/L		4.6	9.2	24	3.4	6.9	5.3	8.2	2.65	3.52	3.82
Iron	mg/L	0.300	0.66	0.46	1.8	0.14	0.18	0.29	0.94	0.8	0.725	0.525
Manganese	mg/L		0.064	0.11	0.7	0.053	0.066	0.058	0.27	0.093	0.088	0.07
Ammonia (total)	mg/L		0.20	0.45	0.54	<0.05	0.14	0.20	0.38	<0.02	0.32	0.23
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.7	1.1	1.6	0.6	0.6	0.6	0.8	0.59	0.43	0.57
Nitrite	mg/L		0.02	0.04	0.10	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05
Nitrate	mg/L		0.2	0.6	1.3	0.2	0.3	0.1	0.2	0.08	0.22	0.24
DOC	mg/L		6.0	8.4	10.2	4.1	5.2	5.3	5.5	6.3	7.9	7
COD	mg/L			17	29	17	16	14	20	<5	18	22
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.039	0.1	0.3	0.013	0.053	0.037	0.068	0.021	0.017	0.018
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.025	0.028	0.065	0.022	0.028	0.021	0.038	0.044	0.024	0.03
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.005	<0.005	<0.005	0.13	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	0.001	0.003	0.002	0.003	<0.001	<0.001	0.001	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.023	0.014	0.039	0.004	0.004	0.009	0.022	0.03	0.03	0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.006	0.007	0.007	<0.005	<0.005	<0.005	<0.005	0.021	0.068	0.005
Total Dissolved Solids	mg/L		48		150	40	73	50	79	48	62	52
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003
BOD5	mg/L											
Total Suspended Solids	mg/L											

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2
SAMPLING DATE			21-Sep-11	27-Oct-11	17-Nov-11	16-May-12	13-Jun-12	18-Jul-12	23-Aug-12	12-Sep-12	17-Oct-12	15-Nov-12
pH	pH units	6.5 - 8.5	7.91	7.12	7.26	6.73	6.94	8.14	7.27	6.96	6.87	6.87
Conductivity	µS/cm		183	82	83	54	56	784	145	77	77	68
Alkalinity (as CaCO ₃)	mg/L		63	14	12	10	15	283	33	8	8	9
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		63	14	12	10	15	283	33	8	8	9
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		16.3	7.4	6.68	4.05	3.68	82.7	13.1	7.3	6.69	6.12
Sulphate	mg/L		11.7	10.7	9.54	5.18	3.85	48.7	18.9	14.6	14.3	10.2
Calcium	mg/L		18.5	7.95	6.98	4.64	5.40	77.7	14.1	7.3	8.43	6.62
Magnesium	mg/L		5.42	1.96	1.73	1.04	1.25	20.9	3.77	1.62	1.87	1.46
Potassium	mg/L		4.63	1.5	1.26	0.68	0.70	21.4	2.80	1.09	1.39	0.99
Sodium	mg/L		11.4	4.35	3.86	2.72	2.77	58.7	8.44	3.49	3.74	3.54
Iron	mg/L	0.300	0.381	0.353	0.378	0.368	1.05	1.42	0.039	0.211	0.305	0.312
Manganese	mg/L		0.305	0.085	0.065	0.036	0.054	4.19	0.187	0.021	0.034	0.054
Ammonia (total)	mg/L		0.2	0.2	0.11	0.04	0.40	1.48	0.22	<0.02	0.2	0.29
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.67	0.56	0.28	0.22	0.88	3.45	0.78	0.62	0.54	0.56
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.09	<0.05	<0.05
Nitrate	mg/L		0.33	0.12	0.08	0.11	0.14	1.34	0.44	<0.05	0.06	0.07
DOC	mg/L		7	6.8	5.7	4.2	8.5	21.7	4.9	4.8	8	6.3
COD	mg/L		14	15	14	11	20	55	<5	17	27	18
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.099	0.022	0.018	<0.010	<0.010	0.569	0.066	0.018	<0.010	0.015
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.037	0.027	0.025	0.021	0.021	0.174	0.044	0.031	0.04	0.025
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	<0.02	<0.02	<0.02	<0.006	0.05	0.06	<0.02	0.02	0.011	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	0.008	0.039	0.032	0.242	0.029	<0.005	<0.005	0.011	0.006
Total Dissolved Solids	mg/L		122	60	104	46	52	504	102	62	64	76
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L											
Total Suspended Solids	mg/L											

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2
SAMPLING DATE			13-May-13	10-Jun-13	11-Jul-13	13-Aug-13	9-Sep-13	29-Oct-13	26-Nov-13	21-May-14	18-Jun-14	24-Jul-14
pH	pH units	6.5 - 8.5	7.25	6.27	7.15	6.77	6.94	6.37	6.53	6.82	6.65	6.87
Conductivity	µS/cm		179	47	57	79	159	52	54	41	32	64
Alkalinity (as CaCO ₃)	mg/L		47	10	17	24	43	8	8	6	<5	13
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		47	10	17	24	43	8	8	6	<5	13
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		18.2	3.22	2.83	6.67	17.7	4.37	4.17	3.48	2.71	5.7
Sulphate	mg/L		10.3	3.67	3.19	4.01	10.5	5.68	6.4	4.73	2.97	4.02
Calcium	mg/L		16.3	4.39	8.79	6.51	14.2	5.27	4.41			5.87
Magnesium	mg/L		4.18	0.93	1.36	1.51	3.76	1.26	1.05			1.34
Potassium	mg/L		3.54	0.52	0.82	0.88	3.17	0.95	0.74			0.88
Sodium	mg/L		11.3	2.39	2.72	3.51	9.66	3.12	2.91			3.57
Iron	mg/L	0.300	0.555	1.5	0.503	0.452	0.443	0.214	0.382	0.307	0.696	0.726
Manganese	mg/L		0.149	0.08	0.07	0.104	0.137	0.018	0.061			
Ammonia (total)	mg/L		0.26	<0.02	0.02	0.11	0.04	0.02	0.08	0.06	0.02	0.06
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.47	1.2	0.1	0.2	<0.10	0.54	0.49	<0.10	0.46	0.15
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.17	0.09	0.23	0.17	0.34	0.05	0.12	<0.05	<0.05	0.16
DOC	mg/L		7.4	9.1	6.9	5.6	6.8	7	5.4			6.6
COD	mg/L		17	23	15	14	18	24	15	9	28	13
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.034	<0.010	0.049	0.017	0.06	0.012	0.023	0.012	<0.010	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.028	0.022	0.022	0.022	0.035	0.021	0.023	0.022	0.02	0.021
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.016	0.04	0.03	<0.02	<0.02	0.03	0.03	0.03	0.03	0.03
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.009	0.009	0.006	0.034	<0.005	0.006	0.022	<0.005	0.011	<0.005
Total Dissolved Solids	mg/L		36	44	58	72	108	58	64	32	38	52
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L									<5	<5	<5
Total Suspended Solids	mg/L											

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2
SAMPLING DATE			20-Aug-14	10-Sep-14	15-Oct-14	12-Nov-14	06-May-15	10-Jun-15	19-Aug-15	23-Sep-15	27-Oct-15	17-Nov-15	18-May-16	29-Jun-16	20-Jul-16
pH	pH units	6.5 - 8.5	6.99	7.14	6.59	6.76	6.85	6.57	7.2	7.28	6.84	6.78	6.49	7.01	6.51
Conductivity	µS/cm		87	86	39	34	39	38	53	69	64	94	38	55	62
Alkalinity (as CaCO ₃)	mg/L		15	17	6	<5	6	10	17	18	13	8	6	13	13
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		15	17	6	<5	6	10	17	18	13	8	6	13	13
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L														
Chloride	mg/L		7.14	7.91	3.54	3.12	3.42	2.7	3.11	4.78	5.79	6.92	3.49	3.68	5.60
Sulphate	mg/L		5.41	6.44	3.04	3.42	4.17	2.59	2.72	3.12	4.66	16.2	5.46	4.09	5.32
Calcium	mg/L								5.14	6.13				4.56	
Magnesium	mg/L								1.25	1.56				1.13	
Potassium	mg/L									1.15					
Sodium	mg/L								2.84	3.86				2.93	
Iron	mg/L	0.300	0.633	0.635	0.814	0.427	0.366	0.978	0.642	0.544	0.208	0.165	0.238	0.1876	0.455
Manganese	mg/L									0.108					
Ammonia (total)	mg/L		0.07	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.02	<0.02	<0.02	<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.25	0.28	0.58	0.33	0.25	0.59	0.33	0.35	0.17	0.24	0.30	0.14	0.37
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.11	0.19	<0.05	0.05	0.11	0.06	0.18	0.09	<0.05	0.15	<0.05	0.25	0.17
DOC	mg/L									6					
COD	mg/L		23	17	22	6	9	25	9	18	13	9	6	11	8
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.032	0.021	<0.010	<0.010	<0.010	0.012	<0.010	0.015	<0.010	<0.010	<0.010	0.013	0.017
Phosphate	mg/L														
Aluminum	mg/L	0.075*													
Barium	mg/L		0.023	0.024	0.031	0.017	0.017	0.022	0.016	0.017	0.017	0.024	0.019	0.021	0.021
Beryllium	mg/L	0.011*													
Bismuth	mg/L														
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009													
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*													
Nickel	mg/L	0.025													
Phosphorus (total)	mg/L	0.030*	<0.02	<0.02	0.08	0.05	0.02	0.05	<0.02	<0.05	<0.02	<0.02	<0.02	0.02	0.03
Silver	mg/L	0.0001													
Strontium	mg/L														
Vanadium	mg/L	0.006*													
Zinc	mg/L	0.020*	<0.005	<0.005	0.009	0.006	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	0.006
Total Dissolved Solids	mg/L		70	80	32	46	32	36	78	46	48	66	30	44	40
Selenium	mg/L	0.100													
Antimony	mg/L	0.020*													
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Suspended Solids	mg/L						<10	19	<10	<10	<10	<10	<10	<10	<10

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2
SAMPLING DATE			17-Aug-16	14-Sep-16	30-Oct-16	24-May-17	28-Aug-17	22-Nov-17	22-May-18	19-Sep-18	14-Nov-18	15-May-19	20-Nov-19	14-May-20	19-Aug-20
pH	pH units	6.5 - 8.5	7.03	7.24	6.92	7.21	6.84	7.19	7.59	6.62	6.53	6.43	6.84	7.12	6.53
Conductivity	µS/cm		79	75	81	44	40	46	445	53	57	43	69	51	71
Alkalinity (as CaCO ₃)	mg/L		8	16	13	9	9	9	150	11	11	8	12	10	22
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		8	16	13	9	9	9	150	11	11	8	12	10	22
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L														
Chloride	mg/L		8.60	7.36	8.66	3.48	2.57	3.42	41	3.95	4.64	3.17	4.33	4.09	5.9
Sulphate	mg/L		7.76	5.43	6.48	4.28	2.32	4.30	27.2	3.89	4.75	3.76	9.21	5.46	4.1
Calcium	mg/L		5.56			3.63	3.73	3.87	43.1	4.51	4.14	2.81	5.29	4.69	7.46
Magnesium	mg/L		1.60			0.86	0.89	0.95	10.1	1.17	1.08	0.74	1.34	1.13	1.93
Potassium	mg/L					0.79	0.51	0.97	9.81	0.74	1.73	0.67	0.87	0.78	1.22
Sodium	mg/L		3.99			2.36	2.10	2.47	30.3	2.78	3.04	2.24	3.22	2.74	4.75
Iron	mg/L	0.300	0.933	0.089	0.234	0.542	1.26	0.398	0.411	0.497	0.349	0.228	0.273	0.327	0.965
Manganese	mg/L														
Ammonia (total)	mg/L		<0.02	0.09	0.04	0.03	<0.02	<0.02	0.1	<0.02	<0.02	<0.02	0.05	<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.38	0.31	0.27	0.47	0.43	<0.10	0.67	0.28	<0.10	<0.10	0.18	0.22	0.36
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.21	0.16	0.17	0.08	0.11	0.11	2.39	0.13	0.10	0.10	0.18	0.12	0.21
DOC	mg/L					10.1	9.1	4.7	13	6.4	5.6	4.8	4.8	4.1	7.3
COD	mg/L		18	8	6	27	31	<5	13	7	<5	7	6	14	<5
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02	<0.001	0.002
Boron	mg/L	0.200*	0.012	0.015	<0.010	0.223	0.013	<0.010	0.262	<0.010	0.014	<0.010	0.018	0.012	0.038
Phosphate	mg/L														
Aluminum	mg/L	0.075*													
Barium	mg/L		0.033	0.024	0.025	0.051	0.023	0.014	0.036	0.02	0.015	0.017	0.017	0.017	0.021
Beryllium	mg/L	0.011*													
Bismuth	mg/L														
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	<0.003	0.005	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009													
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	0.003	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*													
Nickel	mg/L	0.025													
Phosphorus (total)	mg/L	0.030*	0.03	<0.02	<0.02	0.06	0.04	<0.02	0.06	0.02	0.03	<0.02	<0.001	<0.02	0.02
Silver	mg/L	0.0001													
Strontium	mg/L														
Vanadium	mg/L	0.006*													
Zinc	mg/L	0.020*	0.008	<0.005	<0.005	0.006	0.009	0.007	<0.005	<0.005	0.019	0.005	0.005	<0.005	<0.005
Total Dissolved Solids	mg/L		78	40	56	100	54	42	256	50	48	<20	58	44	66
Selenium	mg/L	0.100													
Antimony	mg/L	0.020*													
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<2
Total Suspended Solids	mg/L		<10	<10	<10	19	<10	<10	<10	<10	<10	<10	<10	<10	<10

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2
SAMPLING DATE			26-Nov-20	13-May-21	31-Aug-21	9-Nov-21	5-May-22	15-Sep-22	23-Nov-22	23-May-23	22-Aug-23	8-Nov-23	1-May-24	30-Sep-24
pH	pH units	6.5 - 8.5	6.46	6.50	6.77	6.60	7.51	7.12	7.24	6.95	6.9	6.84	7.27	6.99
Conductivity	µS/cm		52	55	98	56	40	181	110	73	143	77	63	122
Alkalinity (as CaCO ₃)	mg/L		14	12	34	15	11	43	32	17	41	27	17	34
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		14	12	34	15	11	43	32	17	41	27	17	34
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L													
Chloride	mg/L		4.28	4.73	7.17	3.82	3.74	16.1	8.9	4.52	9.7	6.01	3.96	10.7
Sulphate	mg/L		3.64	4.43	4.80	3.75	3.17	9.39	8.43	5	6.26	6.05	4.08	6.75
Calcium	mg/L		4.5	6.17	9.24	5.28	3.2	17.1	8.13	6.9	9.47	8.14	4.98	12.1
Magnesium	mg/L		1.12	1.59	2.22	1.20	0.76	4.4	2.4	1.57	2.8	1.89	1.29	3.23
Potassium	mg/L		0.77	1.13	1.60	0.79	<1.15	2.9	1.53	1.13	1.55	2.43	1.21	2.64
Sodium	mg/L		2.77	3.85	5.81	3.37	2.46	13.3	6.5	4.2	8.16	4.92	3.64	8.42
Iron	mg/L	0.300	0.842	0.538	0.967	0.556	0.369	0.473	0.29	0.391	0.729	0.903	0.485	0.735
Manganese	mg/L													
Ammonia (total)	mg/L		0.05	0.03	0.02	0.04	<0.02	0.02	0.05	<0.02	<0.02	0.06	<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.33	0.34	0.32	0.24	0.21	0.26	0.23	<0.10	<0.10	0.3	<0.10	<0.10
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.15	0.15	0.18	0.12	0.1	0.18	0.29	0.12	0.34	0.11	0.14	0.24
DOC	mg/L		6.7	5.3	7.8	5.7	4.9	6.8	5.4	6.2	7.4	7.9	6.3	7.3
COD	mg/L		<5	<5	13	11	11	10	19	21	31	40	15	25
Phenols	mg/L	0.001	0.001	<0.001	<0.001	0.002	<0.001	0.001	0.001	<0.001	<0.001	0.004	0.001	<0.001
Boron	mg/L	0.200*	0.013	0.018	0.056	0.021	<0.010	0.078	0.035	0.027	0.054	0.043	0.04	0.064
Phosphate	mg/L													
Aluminum	mg/L	0.075*												
Barium	mg/L		0.017	0.017	0.023	0.016	0.019	0.032	0.019	0.019	0.021	0.025	0.021	0.025
Beryllium	mg/L	0.011*												
Bismuth	mg/L													
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	<0.003	<0.003
Cobalt	mg/L	0.0009												
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0009	<0.0005
Molybdenum	mg/L	0.040*												
Nickel	mg/L	0.025												
Phosphorus (total)	mg/L	0.030*	0.02	<0.02	0.04	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02
Silver	mg/L	0.0001												
Strontium	mg/L													
Vanadium	mg/L	0.006*												
Zinc	mg/L	0.020*	<0.005	0.005	<0.005	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total Dissolved Solids	mg/L		30	44	58	116	20	76	66	<10	74	60	60	64
Selenium	mg/L	0.100												
Antimony	mg/L	0.020*												
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<2	<2.00	<2	<2.00	<2	NA	<2	<2	<2	<2	<2	<2
Total Suspended Solids	mg/L		11	93	<10	14	<10	<10	<10	<10	26	<10	<10	<10

- NOTES:
- 1) Blank indicates data not available.
 - 2) and updates.
 - 3) * indicates interim objective.
 - 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4
SAMPLING DATE			27-Aug-02	29-Oct-07	19-Jun-08	24-Sep-08	9-Jun-09	16-Jul-09	20-Aug-09	17-Sep-09	15-Oct-09	19-Nov-09
pH	pH units	6.5 - 8.5	7.21	7.4	7.7	7.3	7.1	7.4	6.8	7.3	7	7.3
Conductivity	µS/cm		79	265	206	111	79	110	78	155	81	94
Alkalinity (as CaCO ₃)	mg/L		16	33	31	33	23	34	24	52	23	25
Bicarbonate Alkalinity (as CaCO ₃)	mg/L											
Carbonate Alkalinity (as CaCO ₃)	mg/L		<1	<1	<1	<1	<1	<1	<1	<1		
Hardness	mg/L		21.7	67	48	35	24	34	25	53	25	27
Chloride	mg/L		8.4	52	37	7	6	7	6	10	6	6
Sulphate	mg/L		7.4	17	10	9	7	<5	<5	10	6	9
Calcium	mg/L		5.8	22	15	9.9	7.01	9.74	7.38	14.5	6.84	7.53
Magnesium	mg/L		1.77	3.5	2.3	2.9	1.6	2.41	1.66	4.17	1.83	1.92
Potassium	mg/L		0.9	1.7	1.2	2.4	2	2	2	3	1	2
Sodium	mg/L		5.5	19	19	6.1	4.6	5.7	4	8.8	4	4.4
Iron	mg/L	0.300	0.50	0.85	0.11	0.55	2.3	1.6	3.2	0.28	0.47	0.45
Manganese	mg/L		0.031	0.041	0.044	0.12	0.21	0.085	0.21	0.069	0.018	0.027
Ammonia (total)	mg/L		<0.03	<0.05	<0.05	<0.05	0.11	0.08	0.08	<0.05	0.11	0.28
Ammonia (unionized)	mg/L	0.02	<0.02	<0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L											
Nitrite	mg/L		<0.2	<0.01	<0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01
Nitrate	mg/L		<0.2	0.1	0.1	0.4	0.5	0.7	0.3	1	0.1	0.2
DOC	mg/L		3.7					10.1				
COD	mg/L											
Phenols	mg/L	0.001										
Boron	mg/L	0.200*	0.007	0.069	0.037	0.05	0.048	0.073	0.03	0.098	0.041	0.036
Phosphate	mg/L		<1	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01
Aluminum	mg/L	0.075*	0.039	0.67	0.078	0.13	1	0.26	0.69	0.052	0.057	0.075
Barium	mg/L		0.020	0.080	0.056	0.028	0.041	0.031	0.033	0.028	0.018	0.02
Beryllium	mg/L	0.011*	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L		<0.001				<0.001	<0.001	<0.001			
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	mg/L	0.0009	<0.0001	0.0005	<0.0005	<0.0005	0.001	<0.0005	0.0007	<0.0005	<0.0005	<0.0005
Copper	mg/L	0.005	0.0009	0.002	<0.0001	0.002	0.002	0.002	0.002	<0.001	<0.001	<0.001
Lead	mg/L	0.003*	<0.0005	<0.0005	<0.0005	<0.0005	0.001	<0.0005	0.0008	<0.005	<0.0005	<0.005
Molybdenum	mg/L	0.040*	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L	0.025	<0.001	<0.001	<0.0001	<0.0001	0.002	<0.001	0.001	<0.001	<0.001	<0.001
Phosphorus (total)	mg/L	0.030*	<0.05	0.044	0.005	0.011	0.11	0.028	0.075	0.01	0.007	<0.002
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.0001
Strontium	mg/L		0.046				0.066	0.096	0.07	0.11	0.059	0.069
Vanadium	mg/L	0.006*	<0.0005	0.001	<0.001	0.001	0.003	0.001	0.002	<0.001	<0.001	<0.001
Zinc	mg/L	0.020*	<0.005	0.009	<5	0.009	0.016	0.005	0.012	<0.005	<0.005	0.006
Total Dissolved Solids	mg/L		39					59				57
Selenium	mg/L	0.100	<0.002	<0.002	<0.0002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Antimony	mg/L	0.020*	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.002	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BOD5	mg/L											
Total Suspended Solids	mg/L											

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4
SAMPLING DATE			3-May-10	1-Jun-10	13-Jul-10	12-Aug-10	14-Sep-10	19-Oct-10	15-Nov-10	30-May-11	13-Jul-11	25-Aug-11
pH	pH units	6.5 - 8.5	7.3	6.9	7.3	7.2	7.2	7.2	7.20	6.77	7.19	7.53
Conductivity	µS/cm		72	68	207	183	147	83	82	52	81	96
Alkalinity (as CaCO ₃)	mg/L		15	10	63	57	33	22	15	9	23	20
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		15	10	63	57	33	22	15	9	23	20
Carbonate Alkalinity (as CaCO ₃)	mg/L		<1	<1	<1	<1	<1	<1	<1	<5	<5	<5
Hardness	mg/L		21	17	62	60	44	28	24			
Chloride	mg/L		7	7	15	13	13	7	7	4.64	5.85	8.14
Sulphate	mg/L		7	8	12	12	14	7	9	6.18	5.39	10.1
Calcium	mg/L		6.06	5.4	18	17	13	7.8	7.5	5.06	8.41	9.46
Magnesium	mg/L		1.37	1.4	5.2	4.9	4	2.1	2	1.13	2.06	2.29
Potassium	mg/L		2	0.91	5	4.3	2.9	1.5	1.3	0.86	1.51	1.76
Sodium	mg/L		4.0	4.9	12	11	8.6	4.4	4.2	3.06	4.5	5.11
Iron	mg/L	0.300	0.63	0.46	0.48	0.36	0.42	0.22	0.37	0.469	1.03	0.847
Manganese	mg/L		0.056	0.086	0.31	0.25	0.12	0.019	0.027	0.061	0.298	0.145
Ammonia (total)	mg/L		0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.03	0.17	0.07
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.6	0.5	0.6		0.4	0.4	0.4	0.47	0.49	0.65
Nitrite	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05
Nitrate	mg/L		0.2	<0.1	1.0	0.6	0.4	0.2	0.2	0.12	0.29	0.28
DOC	mg/L		5.5	5.4	6.4	5.3	5.0	4.9	4.5	6.4	4.3	7.4
COD	mg/L			17	21	29	17	12	16	<5	13	24
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.029	0.011	0.13	0.099	0.059	0.03	0.024	0.014	0.029	0.031
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.023	0.019	0.048	0.045	0.033	0.019	0.021	0.022	0.034	0.037
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	0.001	0.001	0.001	<0.001	0.001	<0.001	0.001	<0.002	<0.002	0.003
Lead	mg/L	0.003*	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	0.002
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.016	0.016	0.016	0.015	0.012	0.004	0.012	0.03	0.09	0.04
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.006	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	0.098	0.03
Total Dissolved Solids	mg/L		42		120	113	85	50	47	54	68	70
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003
BOD5	mg/L											
Total Suspended Solids	mg/L											

- NOTES:
- 1) Blank indicates data not available.
 - 2) * indicates interim objective.
 - 3) * indicates interim objective.
 - 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4
SAMPLING DATE			21-Sep-11	27-Oct-11	17-Nov-11	16-May-12	13-Jun-12	18-Jul-12	23-Aug-12	12-Sep-12	17-Oct-12	15-Nov-12
pH	pH units	6.5 - 8.5	7.66	7.36	7.4	6.80	6.86	7.48	7.15	7	6.94	6.84
Conductivity	µS/cm		112	105	99	70	62	137	118	95	92	72
Alkalinity (as CaCO ₃)	mg/L		34	21	16	14	16	50	26	13	11	9
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		34	21	16	14	16	50	26	13	11	9
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		9.35	9.62	7.84	5.00	4.12	6.10	9.20	8.76	8.01	6.26
Sulphate	mg/L		9.7	14.4	11.5	6.54	4.57	12.1	17.6	16.4	16.3	11.1
Calcium	mg/L		11.2	10.3	8.48	6.10	6.17	13.8	11.3	8.91	10.2	6.9
Magnesium	mg/L		3.14	2.61	2.18	1.46	1.47	4.43	3.09	2.13	2.34	1.56
Potassium	mg/L		2.34	2	1.46	1.00	0.88	1.83	1.95	1.58	1.76	1.02
Sodium	mg/L		5.9	5.79	4.73	3.63	3.25	7.15	6.14	4.6	4.93	3.72
Iron	mg/L	0.300	0.317	0.453	0.428	0.391	1.01	0.538	0.194	0.242	0.336	0.287
Manganese	mg/L		0.126	0.107	0.058	0.049	0.073	0.673	0.159	0.033	0.027	0.036
Ammonia (total)	mg/L		0.05	0.27	0.26	0.12	0.13	0.19	0.19	<0.02	0.24	0.12
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.14	0.56	0.64	0.22	0.72	1.04	0.73	1.27	0.61	0.46
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.14	<0.05	<0.05
Nitrate	mg/L		0.15	0.17	0.11	0.13	0.15	<0.05	0.23	<0.05	0.07	0.08
DOC	mg/L		4.5	7.3	5.9	4.7	7.8	3.4	3.5	5.4	7.5	6
COD	mg/L		<5	19	19	<5	20	13	<5	15	29	21
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.038	0.037	0.023	0.016	0.013	0.025	0.036	0.027	0.016	0.018
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.032	0.035	0.025	0.022	0.021	0.045	0.038	0.03	0.037	0.026
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	<0.02	<0.02	<0.02	<0.006	0.08	0.07	0.03	0.03	0.015	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.02	1.34	0.035	<0.005	0.005	0.008	0.080	<0.005	<0.005	0.006
Total Dissolved Solids	mg/L		94	78	98	56	48	104	84	72	76	74
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L											
Total Suspended Solids	mg/L											

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4
SAMPLING DATE			13-May-13	10-Jun-13	11-Jul-13	13-Aug-13	9-Sep-13	29-Oct-13	21-May-14	18-Jun-14	24-Jul-14	20-Aug-14
pH	pH units	6.5 - 8.5	6.43	6.21	7.29	6.57	6.72	6.46	6.91	6.87	7.17	7.03
Conductivity	µS/cm		52	64	113	122	106	60	47	42	69	88
Alkalinity (as CaCO ₃)	mg/L		8	13	38	28	26	8	8	8	15	17
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		8	13	38	28	26	8	8	8	15	17
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		4.63	4.68	6.94	9.36	11.3	4.92	4.08	3.4	6.24	7.19
Sulphate	mg/L		6.34	4.59	7.34	7.01	8.24	7.02	5.07	3.75	4.44	5.87
Calcium	mg/L		5.07	6.05	21	9.98	9.65	5.72			6.47	
Magnesium	mg/L		1.12	1.4	3.34	2.63	2.38	1.37			1.47	
Potassium	mg/L		0.8	1	1.96	1.65	1.76	1.04			1.04	
Sodium	mg/L		3	3.64	5.95	5.77	5.79	3.56			3.91	
Iron	mg/L	0.300	0.389	1.35	1.5	0.341	0.477	0.203	0.333	0.695	0.757	0.603
Manganese	mg/L		0.044	0.093	0.55	0.093	0.067	0.012				
Ammonia (total)	mg/L		0.03	0.03	0.05	<0.02	<0.02	0.04	0.03	0.04	0.1	0.06
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.96	1.16	0.38	0.17	<0.10	0.42	<0.10	0.46	0.16	0.32
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		<0.05	0.13	0.25	0.26	0.2	0.06	0.06	0.05	0.18	0.13
DOC	mg/L		6.5	8.3	5.2	5.5	6.3	6.8			6.6	
COD	mg/L		14	22	19	8	23	28	16	27	21	22
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.011	0.014	0.044	0.031	0.042	0.013	0.01	0.013	0.014	0.025
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.021	0.023	0.048	0.028	0.03	0.021	0.021	0.021	0.023	0.023
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.02	0.04	0.08	0.14	0.03	0.02	0.03	0.04	0.04	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.018	0.006	0.053	<0.005	0.025	0.006	<0.005	0.01	0.024	<0.005
Total Dissolved Solids	mg/L		32	50	80	68	78	54	38	46	56	76
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L								<5	<5	<5	<5
Total Suspended Solids	mg/L											

NOTES:

- 1) Blank indicates data not available.
- and updates.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4
SAMPLING DATE			10-Sep-14	15-Oct-14	12-Nov-14	06-May-15	10-Jun-15	22-Jul-15	23-Sep-15	27-Oct-15	17-Nov-15	18-May-16	20-Jul-16	17-Aug-16	14-Sep-16
pH	pH units	6.5 - 8.5	7.3	6.89	7.02	7.07	6.82	7.08	7.51	7.07	7.17	6.75	6.66	7.38	7.66
Conductivity	µS/cm		93	71	47	54	72	73	100	92	122	54	92	165	171
Alkalinity (as CaCO ₃)	mg/L		20	12	9	9	20	22	27	23	14	11	25	21	36
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		20	12	9	9	20	22	27	23	14	11	25	21	36
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L														
Chloride	mg/L		8.42	5.84	3.98	4.67	6.03	5.29	7.99	8.82	10.5	4.86	8.83	13.7	17.7
Sulphate	mg/L		5.35	7.7	4.44	5.28	4.5	3.76	3.92	6.1	19	6.51	6.65	18.8	13.3
Calcium	mg/L								8.36					9.53	
Magnesium	mg/L								2.19					2.51	
Potassium	mg/L								1.72						
Sodium	mg/L								5.87					9.01	
Iron	mg/L	0.300	0.588	0.877	0.423	0.382	0.977	1.04	0.248	0.122	0.133	0.27	0.343	0.909	0.097
Manganese	mg/L								0.041						
Ammonia (total)	mg/L		0.03	0.05	0.06	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.04	0.04	0.11	0.04
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.25	0.66	0.38	0.27	0.54	0.35	0.27	0.17	0.21	0.4	0.34	0.56	0.37
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.18	0.05	0.05	0.13	0.14	0.22	0.14	0.05	0.22	0.06	0.32	0.33	0.4
DOC	mg/L								6.8						
COD	mg/L		16	32	7	12	28	18	12	14	10	<5	12	21	10
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.019	0.033	0.013	0.012	0.031	0.017	0.031	0.019	0.018	0.014	0.032	0.073	0.065
Phosphate	mg/L														
Aluminum	mg/L	0.075*													
Barium	mg/L		0.023	0.029	0.017	0.018	0.029	0.021	0.021	0.018	0.024	0.02	0.022	0.036	0.032
Beryllium	mg/L	0.011*													
Bismuth	mg/L														
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009													
Copper	mg/L	0.005	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	0.004	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*													
Nickel	mg/L	0.025													
Phosphorus (total)	mg/L	0.030*	<0.02	0.08	0.07	0.03	0.04	0.03	<0.05	<0.02	<0.02	<0.02	0.02	0.03	0.04
Silver	mg/L	0.0001													
Strontium	mg/L														
Vanadium	mg/L	0.006*													
Zinc	mg/L	0.020*	<0.005	0.011	0.006	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	<0.005
Total Dissolved Solids	mg/L		78	52	44	50	58	<10	64	58	88	44	60	110	94
Selenium	mg/L	0.100													
Antimony	mg/L	0.020*													
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<5	<5	<5	<5	<5	<5		<5	<5	<5	<5	<5	<5
Total Suspended Solids	mg/L					16	23	64		<10	<10	<10	<10	<10	<10

- NOTES:
- 1) Blank indicates data not available.
 - 2) * indicates interim objective.
 - 3) * indicates interim objective.
 - 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4
SAMPLING DATE			30-Oct-16	24-May-17	28-Aug-17	22-Nov-17	22-May-18	19-Sep-18	14-Nov-18	15-May-19	14-May-20	19-Aug-20	26-Nov-20	13-May-21	31-Aug-21
pH	pH units	6.5 - 8.5	7.19	7.32	7.11	7.39	6.42	7.2	6.61	6.39	7.18	6.58	6.52	6.51	6.94
Conductivity	µS/cm		108	57	98	62	54	72	81	54	64	83	68	59	99
Alkalinity (as CaCO ₃)	mg/L		23	11	21	13	12	13	14	10	11	25	17	12	32
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		23	11	21	13	12	13	14	10	11	25	17	12	32
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L														
Chloride	mg/L		11.5	4.27	4.73	4.37	4.41	5.44	8.34	4.33	5.45	7.02	4.97	5.09	7.32
Sulphate	mg/L		8.89	5.34	3.88	5.60	4.92	6.56	6.58	4.38	7.21	5.25	7.02	5.38	5.54
Calcium	mg/L			4.53	5.37	5.10	5.09	6.07	5.04	4.14	5.39	8.19	6.02	6.23	8.49
Magnesium	mg/L			1.11	1.36	1.30	1.31	1.51	1.27	0.98	1.3	2	1.41	1.60	2.11
Potassium	mg/L			0.88	10.3	1.01	1.2	1.08	4.64	0.90	0.93	1.44	1.2	1.05	1.57
Sodium	mg/L			3.12	3.60	3.44	3.33	3.89	4.07	2.77	3.11	5.21	3.63	4.12	5.66
Iron	mg/L	0.300	0.195	0.394	0.846	0.407	0.501	0.554	0.279	0.286	0.337	0.908	0.846	0.469	0.825
Manganese	mg/L														
Ammonia (total)	mg/L		0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.03	<0.02	0.03	0.08	0.05	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.25	0.21	0.37	0.35	0.18	0.31	0.12	0.22	0.22	0.35	0.28	0.24	0.30
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.21	0.69	0.18	0.13	0.17	0.16	0.11	0.42	0.13	0.22	0.18	0.16	0.18
DOC	mg/L			6.4	9.0	5.1	6.9	6.7	5.8	5.1	4.1	7.7	6.6	5.3	7.7
COD	mg/L		7	14	23	5	<5	<5	<5	18	11	<5	10	<5	14
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002	<0.001	<0.001
Boron	mg/L	0.200*	0.026	0.018	0.026	0.020	0.026	0.027	0.021	0.016	0.018	0.035	0.024	0.019	0.048
Phosphate	mg/L														
Aluminum	mg/L	0.075*													
Barium	mg/L		0.024	0.023	0.020	0.016	0.016	0.023	0.015	0.019	0.018	0.023	0.018	0.017	0.022
Beryllium	mg/L	0.011*													
Bismuth	mg/L														
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	<0.003
Cobalt	mg/L	0.0009													
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*													
Nickel	mg/L	0.025													
Phosphorus (total)	mg/L	0.030*	<0.02	<0.02	0.02	0.02	<0.02	0.03	0.03	0.03	<0.02	<0.02	0.03	<0.02	0.05
Silver	mg/L	0.0001													
Strontium	mg/L														
Vanadium	mg/L	0.006*													
Zinc	mg/L	0.020*	<0.005	0.006	<0.005	0.006	0.006	<0.005	0.006	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	mg/L		72	40	64	56	36	62	40	24	46	94	36	44	62
Selenium	mg/L	0.100													
Antimony	mg/L	0.020*													
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<2	<2	<2.00	<2
Total Suspended Solids	mg/L		<10	<10	<10	<10	<10	<10	13	166	<10	<10	<10	<10	<10

- NOTES:
- 1) Blank indicates data not available.
 - and updates.
 - 3) * indicates interim objective.
 - 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S4	S4	S4	S4	S4	S4	S4
SAMPLING DATE			9-Nov-21	5-May-22	15-Sep-22	23-May-23	8-Nov-23	1-May-24	30-Sep-24
pH	pH units	6.5 - 8.5	6.67	6.5	7.37	6.66	6.53	7.20	7.10
Conductivity	µS/cm		63	56	182	60	76	67	129
Alkalinity (as CaCO ₃)	mg/L		19	10	43	8	24	20	37
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		19	10	43	8	24	20	37
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L								
Chloride	mg/L		4.12	4.78	15.6	6.85	6.07	4.28	11.3
Sulphate	mg/L		4.61	4.72	10.2	4.44	6.19	4.87	7.94
Calcium	mg/L		5.63	4.83	16.2	3.9	8.59	5.96	11.8
Magnesium	mg/L		1.21	1.07	4.08	0.89	1.67	1.52	3.04
Potassium	mg/L		1.33	1.19	3.02	0.64	2.13	1.10	2.62
Sodium	mg/L		3.55	3.62	11.8	5.38	4.28	4.29	8.36
Iron	mg/L	0.300	0.526	0.666	0.352	0.308	0.622	0.557	0.372
Manganese	mg/L								
Ammonia (total)	mg/L		<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.23	0.25	0.21	0.14	0.24	<0.10	0.98
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.13	0.12	0.16	0.08	0.11	0.12	0.23
DOC	mg/L		5.3	5	6.3	6.1	6.4	5.8	7.0
COD	mg/L		6	12	18	15	41	<5	27
Phenols	mg/L	0.001	<0.001	0.001	<0.001	<0.001	0.003	0.001	<0.001
Boron	mg/L	0.200*	0.030	<0.010	0.078	<0.010	0.032	0.042	0.065
Phosphate	mg/L								
Aluminum	mg/L	0.075*							
Barium	mg/L		0.016	0.021	0.035	0.013	0.023	0.021	0.022
Beryllium	mg/L	0.011*							
Bismuth	mg/L								
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	0.0023	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009							
Copper	mg/L	0.005	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005
Molybdenum	mg/L	0.040*							
Nickel	mg/L	0.025							
Phosphorus (total)	mg/L	0.030*	<0.02	0.02	<0.02	<0.02	0.03	<0.02	<0.02
Silver	mg/L	0.0001							
Strontium	mg/L								
Vanadium	mg/L	0.006*							
Zinc	mg/L	0.020*	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total Dissolved Solids	mg/L		160	<10	94	34	34	64	64
Selenium	mg/L	0.100							
Antimony	mg/L	0.020*							
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<2.00	<2	NA	<2	2	<2	<6
Total Suspended Solids	mg/L		<10	<10	<10	<10	<10	<10	<10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S5	S5	S5	S5	S5	S5	S5	S5	S5	S5
SAMPLING DATE			30-May-11	16-May-12	17-Oct-12	15-Nov-12	13-May-13	29-Oct-13	21-May-14	18-Jun-14	15-Oct-14	12-Nov-14
pH	pH units	6.5 - 8.5	7.47	6.94	6.98	6.98	6.59	6.85	7.29	7.46	6.96	7.25
Conductivity	µS/cm		100	164	125	126	127	106	107	88	76	85
Alkalinity (as CaCO ₃)	mg/L		28	23	10	17	16	22	23	28	17	24
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		28	23	10	17	16	22	23	28	17	24
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		12.3	30.6	19.6	22.4	26.2	13.6	15.7	7.68	7.65	7.95
Sulphate	mg/L		2.22	3.45	16.10	6.59	3.8	4.53	2.99	2.31	2.49	3.41
Calcium	mg/L		8.78	12.8	10.9	10.8	9.99	9.47				
Magnesium	mg/L		1.36	2.51	2.16	1.98	1.83	1.72				
Potassium	mg/L		1.01	2.85	3.60	1.85	1.37	2.02				
Sodium	mg/L		10.9	10.5	9.9	9.9	10.8	8.62				
Iron	mg/L	0.300	4.64	0.229	0.420	0.353	0.293	0.303	0.342	0.9	1.22	0.603
Manganese	mg/L		0.293	0.070	0.011	0.006	0.023	0.004				
Ammonia (total)	mg/L		80	0.08	0.22	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	0.02
Ammonia (unionized)	mg/L	0.02	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.33	0.43	1.18	0.54	0.33	0.36	0.2	0.63	0.51	0.49
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12
DOC	mg/L		16.4	9.6	9.9	6.8	7.4	6.9				
COD	mg/L		25	<5	38	24	15	27	17	23	28	<5
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.015	0.014	0.019	0.018	0.011	0.014	0.012	0.018	<0.010	0.011
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.05	0.046	0.049	0.038	0.034	0.031	0.032	0.03	0.041	0.026
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.003	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	<0.05	<0.006	0.027	<0.02	0.017	0.02	0.02	0.04	0.08	0.05
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.007	0.010	0.014	0.007	<0.005	0.005	<0.005	0.006	0.007	0.006
Total Dissolved Solids	mg/L		88	134	100	112	74	80	58	64	56	68
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L								<5	<5	<5	<5
Total Suspended Solids	mg/L											

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S5	S5	S5	S5	S5	S5	S5	S5	S5	S5
SAMPLING DATE			06-May-15	10-Jun-15	18-May-16	22-Nov-17	22-May-18	15-May-19	20-Nov-19	26-Nov-20	13-May-21	9-Nov-21
pH	pH units	6.5 - 8.5	7.33	6.88	7.01	7.28	6.57	6.67	6.70	6.75	6.68	6.93
Conductivity	µS/cm		152	138	98	82	124	91	84	89	117	91
Alkalinity (as CaCO ₃)	mg/L		18	33	25	29	36	23	15	29	25	32
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		18	33	25	29	36	23	15	29	25	32
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		31.8	16	14.6	5.90	18	10.7	9.32	8.22	19.4	7.69
Sulphate	mg/L		2.1	1.01	4.31	2.61	3.56	3.09	5.97	3.72	3.70	1.91
Calcium	mg/L					7.42	10.8	6.30	5.81	7.97	8.43	8.04
Magnesium	mg/L					1.40	1.52	0.92	0.98	1.52	1.47	1.00
Potassium	mg/L					1.37	1.49	1.10	1.28	1.34	1.39	1.67
Sodium	mg/L					5.41	11	7.81	7.18	6.86	10.7	7.11
Iron	mg/L	0.300	0.208	12.5	0.264	0.501	3.41	0.260	0.420	0.749	0.644	0.800
Manganese	mg/L											
Ammonia (total)	mg/L		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.33	1.51	0.36	0.33	0.39	0.20	0.28	0.23	0.39	0.24
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DOC	mg/L					6.2	12.1	6.2	9.7	7.7	11.5	6.9
COD	mg/L		14	75	9	8	5	12	16	14	<5	44
Phenols	mg/L	0.001	<0.001	0.002	<0.001	<0.001	0.001	<0.001	<0.02	0.001	<0.001	0.002
Boron	mg/L	0.200*	<0.010	0.017	0.014	<0.010	0.017	<0.010	0.010	<0.010	<0.010	0.011
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.032	0.062	0.031	0.019	0.034	0.023	0.024	0.024	0.027	0.026
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	0.002	0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.02	0.2	<0.02	<0.02	0.04	<0.02	0.002	<0.02	<0.02	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	0.013	0.01	<0.005	<0.005	<0.005	0.006	<0.005	0.005	<0.020
Total Dissolved Solids	mg/L		92	74	72	66	70	24	68	38	70	168
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<5	<5	<5	<5	<5	<5	11	<2	<2.00	<2.00
Total Suspended Solids	mg/L		12	202	<10	<10	21	<10	<10	<10	17	13

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S5	S5	S5	S5
SAMPLING DATE			5-May-22	23-May-23	8-Nov-23	1-May-24
pH	pH units	6.5 - 8.5	6.64	7.06	6.57	7.18
Conductivity	µS/cm		137	135	98	115
Alkalinity (as CaCO ₃)	mg/L		27	32	35	39
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		27	32	35	39
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5
Hardness	mg/L					
Chloride	mg/L		20.5	7.60	9.24	11.2
Sulphate	mg/L		2.77	1.70	2.27	2.17
Calcium	mg/L		10.9	5.53	7.77	8.18
Magnesium	mg/L		1.5	1.11	1.39	1.1
Potassium	mg/L		2.08	1.13	2.36	0.79
Sodium	mg/L		12.9	9.09	10.1	12.4
Iron	mg/L	0.300	0.69	0.387	0.883	0.507
Manganese	mg/L					
Ammonia (total)	mg/L		<0.02	<0.02	<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.32	0.18	0.24	<0.10
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		<0.05	<0.05	<0.05	<0.05
DOC	mg/L		8	8.2	8.5	8.9
COD	mg/L		17	20	47	29
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	<0.010	0.011	0.014	0.02
Phosphate	mg/L					
Aluminum	mg/L	0.075*				
Barium	mg/L		0.037	0.030	0.028	0.031
Beryllium	mg/L	0.011*				
Bismuth	mg/L					
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	0.0006	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009				
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.0005
Molybdenum	mg/L	0.040*				
Nickel	mg/L	0.025				
Phosphorus (total)	mg/L	0.030*	<0.02	<0.02	0.03	<0.02
Silver	mg/L	0.0001				
Strontium	mg/L					
Vanadium	mg/L	0.006*				
Zinc	mg/L	0.020*	<0.020	<0.020	<0.020	<0.020
Total Dissolved Solids	mg/L		86	46	70	56
Selenium	mg/L	0.100				
Antimony	mg/L	0.020*				
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<2	<2	2	<2
Total Suspended Solids	mg/L		<10	<10	<10	<10

NOTES:

1) Blank indicates data not available.

and updates.

3) * indicates interim objective.

4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S6	S6	S6	S6	S6	S6	S6	S6	S6	S6
SAMPLING DATE			16-May-12	12-Sep-12	13-May-13	10-Jun-13	9-Sep-13	29-Oct-13	21-May-14	18-Jun-14	24-Jul-14	20-Aug-14
pH	pH units	6.5 - 8.5	7.11	7.79	6.87	6.53	7.04	7.18	7.46	7.48	7.6	7.76
Conductivity	µS/cm		460	593	455	543	624	457	408	417	611	717
Alkalinity (as CaCO ₃)	mg/L		24	77	18	26	73	21	25	40	39	59
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		24	77	18	26	73	21	25	40	39	59
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		115	133	117.5	140	142	105	101	86.5	135	115
Sulphate	mg/L		5.73	40.10	10.2	8.35	35.2	19.3	11.8	23.9	36.2	75.8
Calcium	mg/L		29.9	59.4	30	33.5	49.4	32.3			38.4	
Magnesium	mg/L		6.56	9.71	7.82	8.53	9.99	9.02			8.73	
Potassium	mg/L		1.79	4.21	2.15	2.07	3.86	2.46			3.19	
Sodium	mg/L		34.9	42.2	35.6	43.4	52.4	37.3			59.4	
Iron	mg/L	0.300	0.176	0.439	0.097	0.506	0.428	0.056	0.214	0.347	0.084	0.315
Manganese	mg/L		0.471	0.385	0.409	0.365	0.36	0.319				
Ammonia (total)	mg/L		<0.05	0.23	0.04	<0.02	<0.02	<0.02	<0.02	0.08	0.09	0.06
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.03	0.84	<0.10	0.94	0.18	<0.10	0.3	0.38	0.14	0.38
Nitrite	mg/L		<0.05	<0.05	<0.10	<0.10	<0.20	<0.05	<0.05	<0.05	<0.10	<0.05
Nitrate	mg/L		0.14	<0.05	<0.10	0.18	0.23	0.12	0.15	0.12	<0.10	0.08
DOC	mg/L		5	8.5	3.4	3.7	7.1	3			5.4	
COD	mg/L		<0.10	23	<5	12	16	17	8	15	11	20
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.032	0.230	0.047	0.05	0.197	0.062	0.037	0.071	0.078	0.177
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.181	0.146	0.187	0.21	0.181	0.182	0.169	0.124	0.172	0.166
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.002	<0.002	<0.002	<0.0001	<0.002	0.0002	0.0001	0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.003	<0.003	<0.003	<0.002	<0.003	<0.002	<0.002	0.003	<0.002	0.003
Lead	mg/L	0.003*	<0.002	<0.002	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	2.9	0.03	<0.05	<0.02	<0.05	0.02	0.03	0.03	0.75	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.161	0.007	0.017	0.012	0.006	0.025	0.011	0.015	0.007	0.01
Total Dissolved Solids	mg/L		322	444	264	358	432	282	278	310	372	406
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L								<5	<5	<5	<5
Total Suspended Solids	mg/L											

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S6	S6	S6	S6	S6	S6	S6	S6	S6	S6
SAMPLING DATE			15-Oct-14	06-May-15	10-Jun-15	18-May-16	24-May-17	28-Aug-17	22-May-18	15-May-19	14-May-20	26-Nov-20
pH	pH units	6.5 - 8.5	7.2	7.41	7.19	7.16	7.80	7.58	7.09	7.19	7.64	6.94
Conductivity	µS/cm		330	294	383	311	329	352	343	369	362	302
Alkalinity (as CaCO ₃)	mg/L		40	25	52	34	33	51	79	54	40	48
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		40	25	52	34	33	51	79	54	40	48
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		44	63.1	68.8	67.6	66.5	52.5	59.7	62.0	58.1	39.1
Sulphate	mg/L		44.6	11.6	26.1	16.8	18.4	29.2	11.5	20.5	46.5	34.6
Calcium	mg/L						18.9	24.3	27.3	18.4	27.06	22.46
Magnesium	mg/L						4.39	4.25	4.65	3.38	4.43	3.57
Potassium	mg/L						2.75	3.64	4.87	4.20	3.93	4.05
Sodium	mg/L						31.3	30.2	30.7	33.3	30.30	24.48
Iron	mg/L	0.300	0.604	0.168	0.383	0.135	0.044	0.196	0.516	0.438	0.069	0.788
Manganese	mg/L											
Ammonia (total)	mg/L		0.19	0.05	0.04	0.04	<0.02	<0.02	<0.02	0.16	<0.02	0.09
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		1.3	0.32	0.51	0.34	0.18	0.40	0.75	0.38	0.34	0.36
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.08	0.32	0.34	0.28	0.21	0.24	0.2	0.24	0.20	0.59
DOC	mg/L						4.5	7.0	7.6	5.9	4.8	7.9
COD	mg/L		30	7	21	<5	13	19	<5	9	22	6
Phenols	mg/L	0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.111	0.043	0.134	0.072	0.056	0.153	0.137	0.109	0.113	0.104
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.086	0.074	0.108	0.088	0.087	0.057	0.067	0.072	0.065	0.048
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.08	0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.016	0.005	0.005	0.006	0.006	<0.005	0.005	0.007	<0.005	<0.005
Total Dissolved Solids	mg/L		194	162	220	184	162	194	190	158	210	152
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<2
Total Suspended Solids	mg/L			<10	<10	<10	<10	<10	<10	<10	31	<10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S6	S6	S6	S6
SAMPLING DATE			13-May-21	5-May-22	8-Nov-23	1-May-24
pH	pH units	6.5 - 8.5	6.84	6.95	6.89	7.57
Conductivity	µS/cm		312	381	432	393
Alkalinity (as CaCO ₃)	mg/L		40	47	62	66
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		40	47	62	66
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5
Hardness	mg/L					
Chloride	mg/L		51.8	48.5	50.4	42.6
Sulphate	mg/L		33.4	61.3	76.7	59.9
Calcium	mg/L		29.9	33.3	43.3	39.3
Magnesium	mg/L		5.08	4.65	5.32	5.22
Potassium	mg/L		4.75	6.72	9.22	5.06
Sodium	mg/L		32.0	30.9	27.4	35.9
Iron	mg/L	0.300	0.307	0.472	1.99	0.277
Manganese	mg/L					
Ammonia (total)	mg/L		<0.02	<0.02	0.06	0.03
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.62	0.37	0.36	0.15
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.25	0.56	0.78	0.3
DOC	mg/L		6.2	6.8	5.8	7.1
COD	mg/L		<5	9	38	21
Phenols	mg/L	0.001	<0.001	0.001	0.002	<0.001
Boron	mg/L	0.200*	0.107	0.274	0.369	0.288
Phosphate	mg/L					
Aluminum	mg/L	0.075*				
Barium	mg/L		0.054	0.063	0.074	0.051
Beryllium	mg/L	0.011*				
Bismuth	mg/L					
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009				
Copper	mg/L	0.005	0.003	0.002	0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.0005
Molybdenum	mg/L	0.040*				
Nickel	mg/L	0.025				
Phosphorus (total)	mg/L	0.030*	<0.02	<0.02	0.03	<0.02
Silver	mg/L	0.0001				
Strontium	mg/L					
Vanadium	mg/L	0.006*				
Zinc	mg/L	0.020*	<0.005	<0.020	<0.020	<0.020
Total Dissolved Solids	mg/L		178	202	250	230
Selenium	mg/L	0.100				
Antimony	mg/L	0.020*				
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<2.00	<2	3	<2
Total Suspended Solids	mg/L		<10	<10	15	10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S7	S7	S7	S7	S7	S7	S7	S7	S7	S7
SAMPLING DATE			17-Oct-12	15-Nov-12	13-May-13	10-Jun-13	11-Jul-13	13-Aug-13	9-Sep-13	29-Oct-13	26-Nov-13	21-May-14
pH	pH units	6.5 - 8.5	6.56	6.49	6.15	6	6.85	6.3	6.26	6.11	6.07	6.65
Conductivity	µS/cm		68	53	40	43	50	62	64	41	38	36
Alkalinity (as CaCO ₃)	mg/L		5	<5	5	8	15	10	10	<5	<5	<5
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		5	<5	5	8	15	10	10	<5	<5	<5
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		5.76	4.62	3.54	2.96	2.58	5.7	7.89	3.54	2.97	3.18
Sulphate	mg/L		13.3	9.28	5.56	3.47	2.84	3.53	4.64	5.11	5.48	4.45
Calcium	mg/L		7.49	5.19	3.87	4.08	6.38	5.33	5.92	4.11	3.31	
Magnesium	mg/L		1.6	1.09	0.82	0.85	1.17	1.21	1.33	0.93	0.75	
Potassium	mg/L		1.17	0.67	0.5	0.42	0.62	0.56	0.8	0.63	0.45	
Sodium	mg/L		2.93	2.42	2.18	2.2	2.36	2.77	3.22	2.28	1.96	
Iron	mg/L	0.300	0.552	0.285	0.371	1.52	1.36	0.729	0.65	0.216	0.298	0.305
Manganese	mg/L		0.07	0.015	0.018	0.067	0.079	0.036	0.05	0.009	0.035	
Ammonia (total)	mg/L		0.19	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.04	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.59	0.61	0.26	1.14	0.24	0.32	<0.10	0.43	0.33	<0.10
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.08	0.06	<0.05	0.08	0.23	0.22	0.17	0.07	0.12	<0.05
DOC	mg/L		7.5	5.9	6.7	8.3	7.4	6	6.1	6.9	5.5	
COD	mg/L		27	17	15	22	8	12	21	23	17	5
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	<0.010	<0.010	<0.010	<0.010	0.033	<0.010	0.01	<0.010	<0.010	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.053	0.025	0.021	0.022	0.023	0.021	0.027	0.021	0.022	0.02
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.015	<0.02	0.015	0.04	0.05	<0.02	<0.02	0.03	<0.02	0.03
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	1.4	0.032	0.005	0.014	0.01	<0.005	<0.005	0.007	0.119	0.006
Total Dissolved Solids	mg/L		60	42	36	42	54	58	60	44	54	26
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L											<5
Total Suspended Solids	mg/L											

- NOTES:
- 1) Blank indicates data not available.
 - 2) Blank indicates data not available and updates.
 - 3) * indicates interim objective.
 - 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S7	S7	S7	S7	S7	S7	S7	S7	S7	S7
SAMPLING DATE			18-Jun-14	24-Jul-14	20-Aug-14	10-Sep-14	15-Oct-14	12-Nov-14	6-May-15	10-Jun-15	22-Jul-15	19-Aug-15
pH	pH units	6.5 - 8.5	6.66	6.89	7.08	7.05	6.53	6.69	6.79	6.58	7.97	6.94
Conductivity	µS/cm		31	45	59	50	34	31	38	36	52	49
Alkalinity (as CaCO ₃)	mg/L		<5	11	13	12	5	<5	5	9	22	14
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		<5	11	13	12	5	<5	5	9	22	14
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		2.69	3.42	3.54	3.88	3.17	2.92	3.44	2.54	2.84	2.82
Sulphate	mg/L		2.82	2.72	3.32	2.59	2.4	3.2	4.08	2.46	2.55	2.52
Calcium	mg/L			4.3								4.76
Magnesium	mg/L			0.93								1.13
Potassium	mg/L			0.52								
Sodium	mg/L			2.22								2.5
Iron	mg/L	0.300	0.649	0.842	0.728	0.855	0.625	0.364	0.19	1.11	1.41	0.976
Manganese	mg/L											
Ammonia (total)	mg/L		<0.02	0.05	0.1	0.03	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.42	0.18	0.31	0.25	0.54	0.29	0.23	0.58	0.37	0.43
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		<0.05	0.15	0.07	0.15	<0.05	<0.05	0.09	0.06	0.22	0.16
DOC	mg/L			6.3								
COD	mg/L		27	20	23	16	24	<5	8	35	23	18
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	<0.010	<0.010	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.02	0.018	0.021	0.022	0.023	0.016	0.011	0.024	0.019	0.016
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.03	0.03	<0.02	<0.02	0.08	0.04	0.05	0.04	0.02	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.009	<0.005	<0.005	<0.005	0.007	0.006	<0.005	0.01	0.005	<0.005
Total Dissolved Solids	mg/L		36	44	52	54	30	44	28	40	<10	50
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Suspended Solids	mg/L								<10	20	50	<10

- NOTES:
- 1) Blank indicates data not available.
 - 2) * indicates interim objective.
 - 3) * indicates interim objective.
 - 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S7	S7	S7	S7	S7	S7	S7	S7	S7	S7
SAMPLING DATE			23-Sep-15	27-Oct-15	17-Nov-15	18-May-16	29-Jun-16	20-Jul-16	17-Aug-16	14-Sep-16	30-Oct-16	24-May-17
pH	pH units	6.5 - 8.5	7.38	6.64	6.77	6.51	6.89	6.57	7.09	7.13	6.78	7.19
Conductivity	µS/cm		51	56	85	37	52	57	77	65	75	39
Alkalinity (as CaCO ₃)	mg/L		13	9	7	6	11	12	9	12	12	8
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		13	9	7	6	11	12	9	12	12	8
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		3.02	4.76	5.99	3.44	3.35	5.08	8.67	6.45	8	3.10
Sulphate	mg/L		2.75	4.22	15.8	5.47	4.82	4.79	8.07	4.77	5.96	4.18
Calcium	mg/L		4.62				4.32		5.68			3.40
Magnesium	mg/L		1.15				1.05		1.64			0.80
Potassium	mg/L		0.71									0.54
Sodium	mg/L		2.64				2.66		4.08			2.07
Iron	mg/L	0.300	0.521	0.252	0.197	0.219	0.337	0.641	0.964	0.128	0.289	0.811
Manganese	mg/L		0.059									
Ammonia (total)	mg/L		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.22	0.15	0.2	0.30	0.14	0.28	0.35	0.26	0.24	0.24
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.09	0.35	0.15	0.05	0.24	0.17	0.21	0.16	0.2	0.08
DOC	mg/L		5.9									6.4
COD	mg/L		17	13	10	<5	9	7	12	<5	7	16
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	<0.010	<0.010	<0.010	<0.010	<0.010	0.028	0.010	<0.010	<0.010	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.014	0.016	0.025	0.019	0.022	0.023	0.032	0.022	0.024	0.027
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	<0.05	<0.02	<0.02	<0.02	0.03	0.02	0.02	0.03	<0.02	0.03
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.005	<0.005	<0.005	0.005	0.006	<0.005	0.007	<0.005	<0.005	0.009
Total Dissolved Solids	mg/L		42	48	66	32	24	50	78	50	60	32
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L			<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Suspended Solids	mg/L			<10	55	<10	15	<10	<10	<10	<10	<10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S7	S7	S7	S7	S7	S7	S7	S7	S7	S7
SAMPLING DATE			28-Aug-17	22-Nov-17	22-May-18	19-Sep-18	14-Nov-18	15-May-19	20-Nov-19	14-May-20	19-Aug-20	26-Nov-20
pH	pH units	6.5 - 8.5	6.20	6.96	6.1	6.98	6.34	6.33	6.67	6.91	6.49	6.37
Conductivity	µS/cm		40	35	38	45	35	37	44	38	49	39
Alkalinity (as CaCO ₃)	mg/L		10	6	7	9	6	9	6	6	15	8
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		10	6	7	9	6	9	6	6	15	8
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		2.38	2.76	3.17	3.35	2.60	3.05	3.02	3.17	4.35	3.22
Sulphate	mg/L		2.21	2.87	3.59	3.18	3.23	2.98	5.92	4.39	2.29	2.76
Calcium	mg/L		3.30	2.87	3.46	4.13	2.87	2.79	3.63	3.38	4.74	3.43
Magnesium	mg/L		0.83	0.74	0.86	1.02	0.72	0.65	0.90	0.89	1.29	0.9
Potassium	mg/L		0.42	0.62	0.75	0.61	0.54	0.59	0.56	0.48	0.84	0.62
Sodium	mg/L		1.89	1.87	2.15	2.27	1.89	1.83	2.07	1.95	3.21	2.07
Iron	mg/L	0.300	0.933	0.412	0.432	0.607	0.374	0.258	0.309	0.273	1.12	0.767
Manganese	mg/L											
Ammonia (total)	mg/L		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.12	<0.02	0.02	0.04
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.41	0.31	0.19	0.31	<0.10	0.20	0.21	0.24	0.41	0.26
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.10	0.11	0.1	0.14	0.08	0.07	0.14	0.09	0.18	0.13
DOC	mg/L		9.0	4.6	6.7	6.7	5.5	3.5	4.7	3.8	7.3	6.4
COD	mg/L		26	6	<5	<5	<5	11	<5	9	<5	6
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02	<0.001	0.002	0.002
Boron	mg/L	0.200*	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.029	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.019	0.014	0.015	0.021	0.014	0.017	0.017	0.015	0.019	0.016
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.001	<0.02	<0.02	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	0.006	0.010	0.009	<0.005	0.009	0.006	0.006	<0.005	<0.005	<0.005
Total Dissolved Solids	mg/L		56	42	34	42	70	<20	50	32	52	20
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<2	4
Total Suspended Solids	mg/L		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S7	S7	S7	S7	S7	S7	S7	S7	S7	S7
SAMPLING DATE			13-May-21	31-Aug-21	9-Nov-21	5-May-22	15-Sep-22	23-Nov-22	22-Aug-23	8-Nov-23	1-May-24	30-Sep-24
pH	pH units	6.5 - 8.5	6.39	6.91	6.41	6.53	7.08	6.98	6.51	6.39	7.03	6.79
Conductivity	µS/cm		37	54	40	52	70	64	71	42	40	66
Alkalinity (as CaCO ₃)	mg/L		8	27	10	9	13	16	20	11	9	17
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		8	27	10	9	13	16	20	11	9	17
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		3.43	3.88	2.83	4.58	6.06	10	4.60	3.76	3.11	6.02
Sulphate	mg/L		2.94	2.58	4.16	4.07	4.91	4.99	2.83	2.74	2.83	3.02
Calcium	mg/L		3.83	4.83	3.38	4.18	6.18	5.23	6.13	3.25	3.33	6.43
Magnesium	mg/L		1.04	1.26	0.73	1.17	1.23	1.69	1.75	1.08	0.98	1.91
Potassium	mg/L		0.69	0.93	0.71	1.18	1.35	0.96	0.75	1.47	<0.50	1.35
Sodium	mg/L		2.48	2.69	2.24	3.21	4.2	3.48	3.81	2.07	3.28	3.53
Iron	mg/L	0.300	0.469	1.03	0.723	0.36	0.166	0.342	0.969	0.703	0.491	0.688
Manganese	mg/L											
Ammonia (total)	mg/L		0.04	<0.02	0.02	<0.02	<0.02	0.05	<0.02	0.02	<0.02	0.04
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.13	0.31	0.22	0.18	0.18	0.21	<0.10	0.19	<0.10	<0.10
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.1	0.14	0.09	0.14	0.14	0.24	0.27	0.08	0.07	0.19
DOC	mg/L		5.4	7.2	5.6	4.9	4.4	3.7	6.5	6.0	5.7	5.9
COD	mg/L		<5	14	6	10	<5	13	27	39	19	21
Phenols	mg/L	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001
Boron	mg/L	0.200*	<0.010	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.015	0.021	0.015	0.019	0.021	0.017	0.019	0.019	0.02	0.02
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	<0.005	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total Dissolved Solids	mg/L		26	64	84	34	30	40	46	38	30	38
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<2.00	4	<2.00	<2	NA	2	2	2	<2	<2
Total Suspended Solids	mg/L		<10	<10	<10	<10	<10	<10	17	<10	<10	<10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S8
SAMPLING DATE			17-Aug-16
pH	pH units	6.5 - 8.5	8.18
Conductivity	µS/cm		732
Alkalinity (as CaCO ₃)	mg/L		143
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		143
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5
Hardness	mg/L		
Chloride	mg/L		60.6
Sulphate	mg/L		106
Calcium	mg/L		67.4
Magnesium	mg/L		13.9
Potassium	mg/L		
Sodium	mg/L		45.7
Iron	mg/L	0.300	0.118
Manganese	mg/L		
Ammonia (total)	mg/L		<0.02
Ammonia (unionized)	mg/L	0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.69
Nitrite	mg/L		<0.10
Nitrate	mg/L		0.32
DOC	mg/L		
COD	mg/L		35
Phenols	mg/L	0.001	<0.001
Boron	mg/L	0.200*	0.439
Phosphate	mg/L		
Aluminum	mg/L	0.075*	
Barium	mg/L		0.066
Beryllium	mg/L	0.011*	
Bismuth	mg/L		
Cadmium	mg/L	0.0001*	<0.0001
Chromium	mg/L	0.01	<0.003
Cobalt	mg/L	0.0009	
Copper	mg/L	0.005	0.007
Lead	mg/L	0.003*	<0.001
Molybdenum	mg/L	0.040*	
Nickel	mg/L	0.025	
Phosphorus (total)	mg/L	0.030*	0.03
Silver	mg/L	0.0001	
Strontium	mg/L		
Vanadium	mg/L	0.006*	
Zinc	mg/L	0.020*	0.005
Total Dissolved Solids	mg/L		448
Selenium	mg/L	0.100	
Antimony	mg/L	0.020*	
Mercury	mg/L	0.0002	<0.0001
Arsenic	mg/L	0.005*	<0.003
BOD5	mg/L		<5
Total Suspended Solids	mg/L		<10

NOTES:

- 1) Blank indicates data not available.
- and updates.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	S9	S9	S9	S9	S9	S9	S9	S9	S9
SAMPLING DATE			24-May-17	22-May-18	15-May-19	14-May-20	26-Nov-20	13-May-21	5-May-22	8-Nov-23	1-May-24
pH	pH units	6.5 - 8.5	7.66	6.76	6.93	7.5	6.68	6.78	6.74	6.63	7.34
Conductivity	µS/cm		221	211	257	346	146	250	209	229	202
Alkalinity (as CaCO ₃)	mg/L		24	43	33	36	30	31	23	32	34
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		24	43	33	36	30	31	23	32	34
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L										
Chloride	mg/L		44.5	37.6	44.9	60.7	17.6	43	27.1	26.9	25.5
Sulphate	mg/L		14.0	9.89	13.6	35.8	15.2	25.4	28	35.8	26.4
Calcium	mg/L		13.3	16.1	12.4	22.58	11.06	22.5	19	24.2	18.4
Magnesium	mg/L		2.89	3.01	2.54	3.83	1.86	4.15	3.98	2.76	3.05
Potassium	mg/L		1.86	2.71	2.88	3.26	2.01	3.79	4.63	3.37	3.79
Sodium	mg/L		19.4	18.3	22.4	25.34	11.37	25.5	18.1	17.8	17.9
Iron	mg/L	0.300	0.088	0.103	0.232	0.091	0.625	0.688	4.36	0.282	0.708
Manganese	mg/L										
Ammonia (total)	mg/L		<0.02	0.04	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.13	0.23	0.18	0.23	0.26	0.34	0.3	0.16	<0.10
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.10	0.23	0.20	<0.05	0.24	0.19	0.33	0.32	0.21
DOC	mg/L		3.9	4.7	4.5	4.1	6.2	5.4	5.4	4.2	5.1
COD	mg/L		15	<5	<5	13	<5	<5	10	33	26
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Boron	mg/L	0.200*	0.040	0.072	0.068	0.09	0.046	0.082	0.115	0.158	0.135
Phosphate	mg/L										
Aluminum	mg/L	0.075*									
Barium	mg/L		0.062	0.035	0.053	0.05	0.028	0.05	0.097	0.047	0.044
Beryllium	mg/L	0.011*									
Bismuth	mg/L										
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.005	<0.003	<0.003
Cobalt	mg/L	0.0009									
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.0005
Molybdenum	mg/L	0.040*									
Nickel	mg/L	0.025									
Phosphorus (total)	mg/L	0.030*	0.06	0.04	0.05	<0.02	<0.02	0.05	0.16	<0.02	0.02
Silver	mg/L	0.0001									
Strontium	mg/L										
Vanadium	mg/L	0.006*									
Zinc	mg/L	0.020*	<0.005	0.006	0.005	<0.005	<0.005	0.005	0.025	<0.020	<0.020
Total Dissolved Solids	mg/L		134	122	112	170	92	152	112	136	114
Selenium	mg/L	0.100									
Antimony	mg/L	0.020*									
Mercury	mg/L	0.0002	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<5	<5	<5	<5	<2	<2.00	<2	<2	<2
Total Suspended Solids	mg/L		201	27	44	<10	31	17	253	<10	26

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1
SAMPLING DATE			20-May-03	23-Nov-04	18-May-05	3-May-06	29-Oct-07	19-Jun-08	24-Sep-08	9-Jun-09	17-Sep-09	3-May-10
pH	pH units	6.5 - 8.5	6.73	7.78	7.08	6.9	7	6.9	6.7	6.7	6.7	6.8
Conductivity	µS/cm		62	67	46.9	60	58	39	47	47	67	54
Alkalinity (as CaCO ₃)	mg/L		9	11	6	11	8	5	6	7	12	8
Bicarbonate Alkalinity (as CaCO ₃)	mg/L											8
Carbonate Alkalinity (as CaCO ₃)	mg/L		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness	mg/L		18.1	15.8	14	18	15	12	13	13	18	14
Chloride	mg/L		4.9	5.1	3.1	4	6	3	4	4	7	5
Sulphate	mg/L		8.4	7.2	6.5	8	8	7	8	7	7	8
Calcium	mg/L		5.23	4.2	3.6	5.9	4.7	3.2	3.4	3.68	5.07	4.09
Magnesium	mg/L		1.23	1.26	1.07	1.4	1.4	0.83	0.84	0.92	1.36	0.97
Potassium	mg/L		1	0.8	0.6	1.2	0.84	0.47	0.49	<1	<1	<1
Sodium	mg/L		2.7	3.4	2.9	3.4	3.8	1.9	2.4	3	4.7	3.3
Iron	mg/L	0.300	0.15	0.38	0.12	0.35	0.44	0.39	0.28	0.69	0.41	0.21
Manganese	mg/L		0.011	0.023	0.028	0.1	0.023	0.042	0.022	0.047	0.027	0.026
Ammonia (total)	mg/L		0.27	0.23	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.03	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L											0.4
Nitrite	mg/L			<0.2	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate	mg/L		0.4	<0.2	0.1	0.2	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
DOC	mg/L		4.6	4.1	4.1							3.9
COD	mg/L											
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*		0.014	<0.01	0.019	<0.01	<0.010	0.01	<0.01	0.024	<0.01
Phosphate	mg/L			<0.3	<0.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Aluminum	mg/L	0.075*		0.047	0.065	0.16	0.078	0.094	0.048	0.29	0.072	
Barium	mg/L			0.015	0.016	0.025	0.017	0.017	0.013	0.018	0.017	0.015
Beryllium	mg/L	0.011*		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Bismuth	mg/L			<0.001						<0.001		
Cadmium	mg/L	0.0001*		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01		<0.005	<0.005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.005
Cobalt	mg/L	0.0009		<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Copper	mg/L	0.005	<0.005	0.0007	0.007	0.003	0.001	<0.0001	<0.0001	0.002	<0.001	<0.001
Lead	mg/L	0.003*		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Molybdenum	mg/L	0.040*		<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	
Nickel	mg/L	0.025		<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	
Phosphorus (total)	mg/L	0.030*		0.06	<0.05	0.02	0.018	0.011	0.01	0.047	0.013	0.005
Silver	mg/L	0.0001		<0.0001	<0.0005	0.0003	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	
Strontium	mg/L			0.031	0.025	0.049				0.026	0.041	
Vanadium	mg/L	0.006*		0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	
Zinc	mg/L	0.020*	0.018	<0.005	0.014	0.011	<0.005	<5	0.007	0.008	<0.005	<0.005
Total Dissolved Solids	mg/L		37	48	22.3							32
Selenium	mg/L	0.100		<0.002	<0.002	<0.002	<0.002	<0.0002	<0.0002	<0.002	<0.002	
Antimony	mg/L	0.020*		<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*		<0.002	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001
BOD5	mg/L											
Total Suspended Solids	mg/L											

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1
SAMPLING DATE			14-Sep-10	30-May-11	21-Sep-11	16-May-12	12-Sep-12	13-May-13	9-Sep-13	21-May-14	10-Sep-14	06-May-15
pH	pH units	6.5 - 8.5	6.9	6.23	7.18	6.54	7.04	6.13	6.15	6.62	6.81	6.79
Conductivity	µS/cm		58	39	64	49	124	44	68	40	50	40
Alkalinity (as CaCO ₃)	mg/L		10	5	11	7	16	5	10	<5	8	5
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		10	5	11	7	16	5	10	<5	8	5
Carbonate Alkalinity (as CaCO ₃)	mg/L		<1	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L		15				88					
Chloride	mg/L		6	2.81	7.48	3.86	21.30	4.02	7.97	3.22	3.89	3.73
Sulphate	mg/L		6	8.11	6.89	5.74	10.90	6.39	6.33	5.49	6.23	4.36
Calcium	mg/L		4.6	3.46	5.22	3.83	7.91	3.72	5.13			
Magnesium	mg/L		1.4	0.85	1.48	0.99	2.26	0.89	1.39			
Potassium	mg/L		0.77	0.55	0.94	0.68	1.45	0.65	0.89			
Sodium	mg/L		4.1	2.18	4.69	2.95	11.10	2.89	4.93			
Iron	mg/L	0.300	0.27	0.19	0.216	0.122	0.352	0.173	0.465	0.208	0.565	0.396
Manganese	mg/L		0.024	0.03	0.029	0.025	0.041	0.03	0.046			
Ammonia (total)	mg/L		<0.05	<0.02	0.05	0.07	0.06	<0.02	0.02	<0.02	0.05	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.4	0.5	0.13	0.27	0.72	<0.10	<0.10	<0.10	0.27	0.26
Nitrite	mg/L		<0.01	<0.05	<0.05	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		<0.1	0.08	<0.05	0.09	<0.05	0.08	<0.05	0.1	<0.05	0.14
DOC	mg/L		4.9	5.9	4.7	4.4	4.5	4.9	5.8			
COD	mg/L		14	<5	<5	26	14	8	20	10	15	11
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Boron	mg/L	0.200*	<0.01	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.014	0.015	0.015	0.013	0.021	0.013	0.019	0.013	0.019	0.016
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.004	<0.02	<0.02	<0.006	0.02	0.019	<0.02	0.02	<0.02	0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	0.016	<0.005	<0.005	<0.005	<0.005	0.123	<0.005	<0.005	<0.005
Total Dissolved Solids	mg/L		32	38	64	42	88	30	56	40	62	28
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L									<5	<5	<5
Total Suspended Solids	mg/L											13

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1
SAMPLING DATE			23-Sep-15	18-May-16	14-Sep-16	24-May-17	22-Nov-17	22-May-18	19-Sep-18	15-May-19	31-Aug-19	20-Nov-19
pH	pH units	6.5 - 8.5	7.05	6.59	7.17	7.15	6.99	6.17	6.8	6.25	6.84	6.75
Conductivity	µS/cm		98	48	80	49	50	45	53	42	118	47
Alkalinity (as CaCO ₃)	mg/L		11	7	12	8	7	8	7	7	11	6
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		11	7	12	8	7	8	7	7	11	6
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		15.6	5.12	10.1	4.63	4.34	4.85	5.68	3.94	14.3	4.73
Sulphate	mg/L		5.09	6.95	5.98	4.64	5.28	4.99	4.69	3.43	5.58	4.97
Calcium	mg/L		5.28			3.14	3.61	3.5	3.94	3.13	5.71	3.34
Magnesium	mg/L		1.43			0.76	0.90	0.83	0.98	0.66	1.53	0.83
Potassium	mg/L		1			0.61	1.10	0.66	0.65	0.57	0.93	0.58
Sodium	mg/L		9.75			3.28	3.19	3.35	3.69	2.62	7.95	3.25
Iron	mg/L	0.300	0.378	0.182	0.252	0.158	0.453	0.184	0.273	0.364	0.187	0.212
Manganese	mg/L		0.024									
Ammonia (total)	mg/L		0.02	<0.02	0.05	<0.02	0.02	<0.02	<0.02	0.02	0.07	0.16
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.4	0.26	0.3	0.23	0.39	0.14	0.27	0.38	0.31	0.16
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		<0.05	0.09	<0.05	0.05	0.08	0.11	<0.05	0.08	<0.05	0.07
DOC	mg/L		6.5			5.9	6.1	5.6	5.4	4.1	4.1	5.5
COD	mg/L		13	<5	8	14	9	<5	<5	12	<5	<5
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02
Boron	mg/L	0.200*	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.016	0.015	0.015	0.014	0.015	0.011	0.017	0.013	0.016	0.011
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	<0.05	<0.02	0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.001
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	0.006	<0.005	0.007	0.007	<0.005	<0.005	0.006	<0.005	<0.005
Total Dissolved Solids	mg/L		64	40	52	24	48	30	40	20	52	36
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L			<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Suspended Solids	mg/L			<10	<10	34	<10	<10	12	33	<10	<10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1
SAMPLING DATE			14-May-20	19-Aug-20	26-Nov-20	13-May-21	31-Aug-21	9-Nov-21	5-May-22	15-Sep-22	23-May-23	22-Aug-23
pH	pH units	6.5 - 8.5	6.64	6.36	6.34	6.29	6.56	6.41	6.37	6.09	6.99	6.25
Conductivity	µS/cm		44	58	51	47	64	49	44	106	74	63
Alkalinity (as CaCO ₃)	mg/L		6	12	8	5	11	10	6	9	17	10
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		6	12	8	5	11	10	6	9	17	10
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		4.66	7.21	5.34	4.94	6.51	4.44	4.09	17.1	4.97	6.2
Sulphate	mg/L		4.8	4.85	5.1	7.68	4.74	4.03	4.09	5.21	6.14	4.49
Calcium	mg/L		3.53	4.32	3.76	4.27	5.01	3.71	3.47	5.85	7.41	4.29
Magnesium	mg/L		0.93	1.16	0.87	1.15	1.22	0.85	0.82	1.55	1.56	1.13
Potassium	mg/L		0.62	0.75	0.58	0.75	0.59	0.79	<1.15	0.96	1.24	0.5
Sodium	mg/L		3.12	4.94	3.55	3.83	4.47	3.52	3.41	8.91	4.75	5.73
Iron	mg/L	0.300	0.221	0.397	0.362	0.345	0.665	0.636	0.339	0.443	0.699	0.487
Manganese	mg/L											
Ammonia (total)	mg/L		0.02	0.03	0.04	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.31	0.32	0.26	0.27	0.33	0.55	0.16	0.2	0.15	<0.10
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.07	<0.05	0.1	0.1	<0.05	0.06	0.14	<0.05	0.12	<0.05
DOC	mg/L		4.7	5.8	9.6	4.9	6.2	6.5	5.7	6.4	6.6	6.7
COD	mg/L		18	<5	<5	<5	16	<5	14	13	13	27
Phenols	mg/L	0.001	0.001	0.003	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.031	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.012	0.013	0.012	0.012	0.019	0.013	0.013	0.018	0.022	0.015
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	<0.02	<0.02	<0.02	<0.02	0.07	0.03	<0.02	<0.02	<0.02	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.020	<0.020	<0.020	<0.020	<0.020
Total Dissolved Solids	mg/L		40	52	28	40	42	90	16	54	54	28
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<5	<2	<2	<2.00	<2	<2.00	<2	NA	<2	<2
Total Suspended Solids	mg/L		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	SW1	SW1	SW1
SAMPLING DATE			8-Nov-23	1-May-24	30-Sep-24
pH	pH units	6.5 - 8.5	6.31	6.79	6.44
Conductivity	µS/cm		47	44	77
Alkalinity (as CaCO ₃)	mg/L		9	8	10
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		9	8	10
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5
Hardness	mg/L				
Chloride	mg/L		4.93	4.26	10.7
Sulphate	mg/L		4.19	3.65	4.84
Calcium	mg/L		3.21	3.26	4.51
Magnesium	mg/L		0.54	0.95	1.24
Potassium	mg/L		0.6	<0.50	0.93
Sodium	mg/L		3.17	4.88	6.35
Iron	mg/L	0.300	0.432	0.211	0.472
Manganese	mg/L				
Ammonia (total)	mg/L		0.04	<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.15	<0.10	<0.10
Nitrite	mg/L		<0.05	<0.05	<0.05
Nitrate	mg/L		0.06	0.06	<0.05
DOC	mg/L		5.1	5.3	5.7
COD	mg/L		37	16	26
Phenols	mg/L	0.001	0.002	<0.001	<0.001
Boron	mg/L	0.200*	<0.010	0.013	<0.010
Phosphate	mg/L				
Aluminum	mg/L	0.075*			
Barium	mg/L		0.014	0.012	0.014
Beryllium	mg/L	0.011*			
Bismuth	mg/L				
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009			
Copper	mg/L	0.005	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.0005	<0.0005
Molybdenum	mg/L	0.040*			
Nickel	mg/L	0.025			
Phosphorus (total)	mg/L	0.030*	<0.02	<0.02	<0.02
Silver	mg/L	0.0001			
Strontium	mg/L				
Vanadium	mg/L	0.006*			
Zinc	mg/L	0.020*	<0.020	<0.020	<0.020
Total Dissolved Solids	mg/L		26	42	34
Selenium	mg/L	0.100			
Antimony	mg/L	0.020*			
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003
BOD5	mg/L		<2	<2	4
Total Suspended Solids	mg/L		<10	<10	<10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2
SAMPLING DATE			20-May-03	23-Nov-04	18-May-05	3-May-06	29-Oct-07	19-Jun-08	24-Sep-08	9-Jun-09	17-Sep-09	3-May-10
pH	pH units	6.5 - 8.5	6.8	7.46	6.57	6.7	7.4	7.6	6.7	6.8	6.5	6.8
Conductivity	µS/cm		72	130	46.6	41	99	72	49	50	66	55
Alkalinity (as CaCO ₃)	mg/L		11	28	5	6	18	16	8	7	11	7
Bicarbonate Alkalinity (as CaCO ₃)	mg/L											7
Carbonate Alkalinity (as CaCO ₃)	mg/L		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness	mg/L		22.2	40.8	13	12	30	23	13	13	18	14
Chloride	mg/L		5.6	10.3	9.7	3	10	6	5	4	7	5
Sulphate	mg/L		11.0	15.0	<0.5	7.0	11	6	6	8	8	8
Calcium	mg/L		6.40	10.70	3.60	4.00	9	6.6	4.6	3.73	5.03	4.13
Magnesium	mg/L		1.51	3.42	1.05	1.4	2.4	1.5	1.2	0.88	1.37	1.00
Potassium	mg/L		1	2.1	0.6	0.79	2	1.1	0.73	<1	1	2
Sodium	mg/L		3.2	6.2	3	2.5	7.8	3.4	3.2	3.3	5.2	3.3
Iron	mg/L	0.300	0.15	0.43	0.24	0.4	0.39	1	0.43	0.26	0.48	0.26
Manganese	mg/L		0.013	0.041	0.03	0.067	0.021	0.055	0.055	0.026	0.031	0.038
Ammonia (total)	mg/L		0.03	0.1	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L											0.4
Nitrite	mg/L			0.3	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate	mg/L		0.3	<0.2	<0.1	<0.1	0.1	0.3	<0.1	0.1	0.1	<0.1
DOC	mg/L		5.0	5.0	4.8							4.1
COD	mg/L											
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200*		0.036	<0.01	<0.01	0.021	0.021	<0.010	<0.01	0.021	<0.01
Phosphate	mg/L			<0.3	<0.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Aluminum	mg/L	0.075*		0.2	0.087	0.17	0.082	0.2	0.11	0.071	0.081	
Barium	mg/L			0.028	0.015	0.019	0.027	0.026	0.018	0.014	0.017	0.016
Beryllium	mg/L	0.011*		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Bismuth	mg/L			<0.001						<0.001		
Cadmium	mg/L	0.0001*		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001
Chromium	mg/L	0.01		<0.005	<0.005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.005
Cobalt	mg/L	0.0009		0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Copper	mg/L	0.005	<0.005	0.0007	0.001	0.003	0.002	<0.0001	<0.0001	<0.001	<0.001	<0.001
Lead	mg/L	0.003*		<0.0005	0.001	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Molybdenum	mg/L	0.040*		<0.001	0.001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	
Nickel	mg/L	0.025		<0.001	0.001	<0.001	<0.001	<0.0001	0.001	<0.001	<0.001	
Phosphorus (total)	mg/L	0.030*		0.06	<0.05	0.019	0.016	0.023	0.02	0.013	0.011	0.013
Silver	mg/L	0.0001		<0.0001	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	
Strontium	mg/L			0.094	0.024	0.029				0.026	0.04	
Vanadium	mg/L	0.006*		<0.0005	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	
Zinc	mg/L	0.020*	0.019	<0.005	0.023	0.015	0.006	0.006	0.005	<0.005	<0.005	0.021
Total Dissolved Solids	mg/L		43	83	21.7							34
Selenium	mg/L	0.100		<0.002	<0.002	<0.002	<0.002	<0.0002	<0.0002	<0.002	<0.002	
Antimony	mg/L	0.020*		<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*		<0.002	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001
BOD5	mg/L											
Total Suspended Solids	mg/L											

NOTES:

- 1) Blank indicates data not available.
- and updates.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2
SAMPLING DATE			14-Sep-10	30-May-11	21-Sep-11	16-May-12	12-Sep-12	13-May-13	9-Sep-13	21-May-14	10-Sep-14	06-May-15
pH	pH units	6.5 - 8.5	6.8	6.54	7.09	6.49	7.01	6.14	6.12	6.65	6.88	6.8
Conductivity	µS/cm		57	40	65	50	124	45	67	40	50	41
Alkalinity (as CaCO ₃)	mg/L		9	5	10	7	16	6	10	5	7	5
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		9	5	10	7	16	6	10	5	7	5
Carbonate Alkalinity (as CaCO ₃)	mg/L		<1	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L		15									
Chloride	mg/L		6	3.02	7.53	3.91	21.40	4.33	8.1	3.28	3.83	3.69
Sulphate	mg/L		6	7.3	7.6	5.86	11.00	6.37	6.24	5.44	6.23	4.4
Calcium	mg/L		4.7	3.6	5.26	3.79	8.07	3.81	4.99			
Magnesium	mg/L		1.5	0.87	1.48	0.97	2.27	0.88	1.36			
Potassium	mg/L		0.85	0.61	0.97	0.71	1.44	0.67	0.88			
Sodium	mg/L		4.6	2.24	4.76	2.91	11.20	2.84	4.97			
Iron	mg/L	0.300	0.3	0.234	0.194	0.128	0.378	0.191	0.395	0.232	0.451	0.227
Manganese	mg/L		0.032	0.037	0.027	0.026	0.042	0.031	0.018			
Ammonia (total)	mg/L		<0.05	<0.02	0.02	0.06	<0.02	<0.02	<0.02	<0.02	0.05	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.4	0.47	0.23	0.21	0.53	<0.10	0.15	0.15	0.22	0.26
Nitrite	mg/L		0.01	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		<0.1	0.08	0.1	0.08	<0.05	0.09	<0.05	0.09	<0.05	0.14
DOC	mg/L		4.9	5.9	4.8	4.5	4.6	5.2	5.5			
COD	mg/L		13	7	15	10	15	16	18	8	14	11
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Boron	mg/L	0.200*	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.014	0.015	0.015	0.013	0.021	0.015	0.018	0.015	0.016	0.012
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.006	<0.02	<0.02	<0.006	0.03	0.009	0.02	0.03	<0.02	0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	0.012	0.122	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	mg/L		32	36	56	38	82	20	56	38	48	26
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L									<5	<5	<5
Total Suspended Solids	mg/L											<10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2
SAMPLING DATE			23-Sep-15	18-May-16	14-Sep-16	24-May-17	22-Nov-17	22-May-18	19-Sep-18	31-Aug-19	20-Nov-19	14-May-20
pH	pH units	6.5 - 8.5	7.07	6.51	7.14	7.45	7.36	6.08	6.89	6.99	6.94	6.88
Conductivity	µS/cm		98	46	80	64	62	46	54	94	62	54
Alkalinity (as CaCO ₃)	mg/L		11	6	12	15	13	7	7	12	10	9
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		11	6	12	15	13	7	7	12	10	9
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		15.9	5.12	10	4.65	4.33	4.67	5.71	14.3	4.96	4.68
Sulphate	mg/L		4.86	6.87	6.01	4.58	6.28	4.93	4.8	5.50	7.85	6.12
Calcium	mg/L		5.26			3.41	4.97	3.6	3.98	5.56	4.73	4.39
Magnesium	mg/L		1.43			0.82	1.27	0.84	0.98	1.49	1.20	1.06
Potassium	mg/L		1.04			0.65	0.95	0.64	0.67	0.91	0.81	0.80
Sodium	mg/L		9.84			3.24	3.70	3.3	3.7	7.88	3.59	3.10
Iron	mg/L	0.300	0.437	0.196	0.243	0.247	0.414	0.25	0.243	0.211	0.232	0.234
Manganese	mg/L		0.025									
Ammonia (total)	mg/L		<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	0.04	0.05	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.32	1.2	0.29	0.32	0.41	0.3	0.26	0.37	0.18	0.25
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.05	0.09	<0.05	0.07	0.12	0.11	<0.05	<0.05	0.13	0.10
DOC	mg/L		6.5			5.9	5.1	6	5.4	3.9	5.0	4.4
COD	mg/L		16	6	8	12	7	<5	<5	<5	<5	20
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02	<0.001
Boron	mg/L	0.200*	<0.010	<0.010	<0.010	<0.010	0.017	<0.010	<0.010	<0.010	0.015	0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.016	0.016	0.015	0.015	0.015	0.011	0.017	0.016	0.014	0.014
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	<0.05	<0.02	<0.02	0.02	0.02	0.04	<0.02	<0.02	<0.001	<0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	0.006	<0.005	0.008	0.007	<0.005	0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	mg/L		52	34	50	44	50	32	46	72	52	38
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L			<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Suspended Solids	mg/L			<10	<10	26	<10	<10	<10	<10	<10	<10

NOTES:

- 1) Blank indicates data not available.
- 2) and updates.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2
SAMPLING DATE			19-Aug-20	26-Nov-20	13-May-21	31-Aug-21	9-Nov-21	5-May-22	15-Sep-22	23-May-23	22-Aug-23	8-Nov-23
pH	pH units	6.5 - 8.5	6.57	6.53	6.33	6.56	6.60	6.19	6.5	6.82	6.29	6.2
Conductivity	µS/cm		86	62	50	64	58	43	107	62	64	46
Alkalinity (as CaCO ₃)	mg/L		26	15	9	12	35	<5	10	11	10	9
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		26	15	9	12	35	<5	10	11	10	9
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness	mg/L											
Chloride	mg/L		7.16	5.04	4.96	6.65	4.49	4.08	17.5	6.29	6.82	4.84
Sulphate	mg/L		5.48	5.24	4.72	4.75	4.30	4.06	5.17	5.07	4.51	4.13
Calcium	mg/L		9.19	5.48	5.29	4.92	5.12	3.35	7.08	4.81	4.3	3.66
Magnesium	mg/L		2.38	1.3	1.36	1.25	1.24	0.75	1.65	1.18	1.17	1.06
Potassium	mg/L		1.47	1.02	0.93	0.91	0.96	<1.15	0.88	0.89	1	0.88
Sodium	mg/L		5.61	3.53	4.07	4.40	3.57	3.29	10.1	5	4.47	3.77
Iron	mg/L	0.300	0.962	0.635	0.365	0.737	1.49	0.385	0.429	0.336	0.546	0.672
Manganese	mg/L											
Ammonia (total)	mg/L		0.03	0.06	<0.02	0.02	0.03	<0.02	<0.02	<0.02	0.02	0.03
Ammonia (unionized)	mg/L	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.34	0.24	0.33	17.6	0.25	0.17	0.22	0.14	<0.10	0.31
Nitrite	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate	mg/L		0.21	0.15	0.12	<0.05	0.10	0.14	<0.05	0.08	<0.05	0.06
DOC	mg/L		7.4	6.3	5	6.3	5.8	5.2	6.1	6.1	6.3	5.8
COD	mg/L		<5	5	<5	15	10	10	20	13	29	32
Phenols	mg/L	0.001	0.002	0.002	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.001	<0.001
Boron	mg/L	0.200*	0.034	0.02	<0.010	0.011	0.020	<0.010	<0.010	0.014	<0.010	<0.010
Phosphate	mg/L											
Aluminum	mg/L	0.075*										
Barium	mg/L		0.024	0.015	0.014	0.018	0.020	0.014	0.018	0.015	0.016	0.017
Beryllium	mg/L	0.011*										
Bismuth	mg/L											
Cadmium	mg/L	0.0001*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009										
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	mg/L	0.003*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.040*										
Nickel	mg/L	0.025										
Phosphorus (total)	mg/L	0.030*	0.03	0.03	<0.02	0.05	0.02	<0.02	<0.02	<0.02	<0.02	0.02
Silver	mg/L	0.0001										
Strontium	mg/L											
Vanadium	mg/L	0.006*										
Zinc	mg/L	0.020*	<0.005	<0.005	<0.005	<0.005	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total Dissolved Solids	mg/L		88	32	46	28	96	34	50	20	34	40
Selenium	mg/L	0.100										
Antimony	mg/L	0.020*										
Mercury	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
BOD5	mg/L		<2	10	<2.00	10	<2.00	<2	NA		<2	<2
Total Suspended Solids	mg/L		13	<10	<10	20	<10	<10	<10	15	<10	<10

NOTES:
1) Blank indicates data not available.
and updates.
3) * indicates interim objective.
4) Shading indicates concentration exceeds PWQO.

TABLE F-2
SURFACE WATER CHEMICAL RESULTS
TRI-R COMMITTEE LANDFILL

PARAMETER	UNITS	PWQO	SW2	SW2
SAMPLING DATE			1-May-24	30-Sep-24
pH	pH units	6.5 - 8.5	6.77	6.50
Conductivity	µS/cm		44	70
Alkalinity (as CaCO ₃)	mg/L		7	10
Bicarbonate Alkalinity (as CaCO ₃)	mg/L		7	10
Carbonate Alkalinity (as CaCO ₃)	mg/L		<5	<5
Hardness	mg/L			
Chloride	mg/L		4.34	9.40
Sulphate	mg/L		3.57	4.36
Calcium	mg/L		3.62	4.52
Magnesium	mg/L		0.51	1.41
Potassium	mg/L		0.65	0.88
Sodium	mg/L		3.40	6.17
Iron	mg/L	0.300	0.212	0.624
Manganese	mg/L			
Ammonia (total)	mg/L		<0.02	<0.02
Ammonia (unionized)	mg/L	0.02	<0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		<0.10	<0.10
Nitrite	mg/L		<0.05	<0.05
Nitrate	mg/L		0.06	<0.05
DOC	mg/L		5.5	6.1
COD	mg/L		17	27
Phenols	mg/L	0.001	0.001	<0.001
Boron	mg/L	0.200*	0.012	<0.010
Phosphate	mg/L			
Aluminum	mg/L	0.075*		
Barium	mg/L		0.011	0.015
Beryllium	mg/L	0.011*		
Bismuth	mg/L			
Cadmium	mg/L	0.0001*	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.003	<0.003
Cobalt	mg/L	0.0009		
Copper	mg/L	0.005	<0.002	<0.002
Lead	mg/L	0.003*	<0.0005	<0.0005
Molybdenum	mg/L	0.040*		
Nickel	mg/L	0.025		
Phosphorus (total)	mg/L	0.030*	<0.02	<0.02
Silver	mg/L	0.0001		
Strontium	mg/L			
Vanadium	mg/L	0.006*		
Zinc	mg/L	0.020*	<0.020	<0.020
Total Dissolved Solids	mg/L		26	26
Selenium	mg/L	0.100		
Antimony	mg/L	0.020*		
Mercury	mg/L	0.0002	<0.0001	<0.0001
Arsenic	mg/L	0.005*	<0.003	<0.003
BOD5	mg/L		<2	<2
Total Suspended Solids	mg/L		<10	<10

NOTES:

- 1) Blank indicates data not available.
- 2) * indicates interim objective.
- 3) * indicates interim objective.
- 4) Shading indicates concentration exceeds PWQO.

FIGURE F-1
TIME CONCENTRATION GRAPH - Chloride

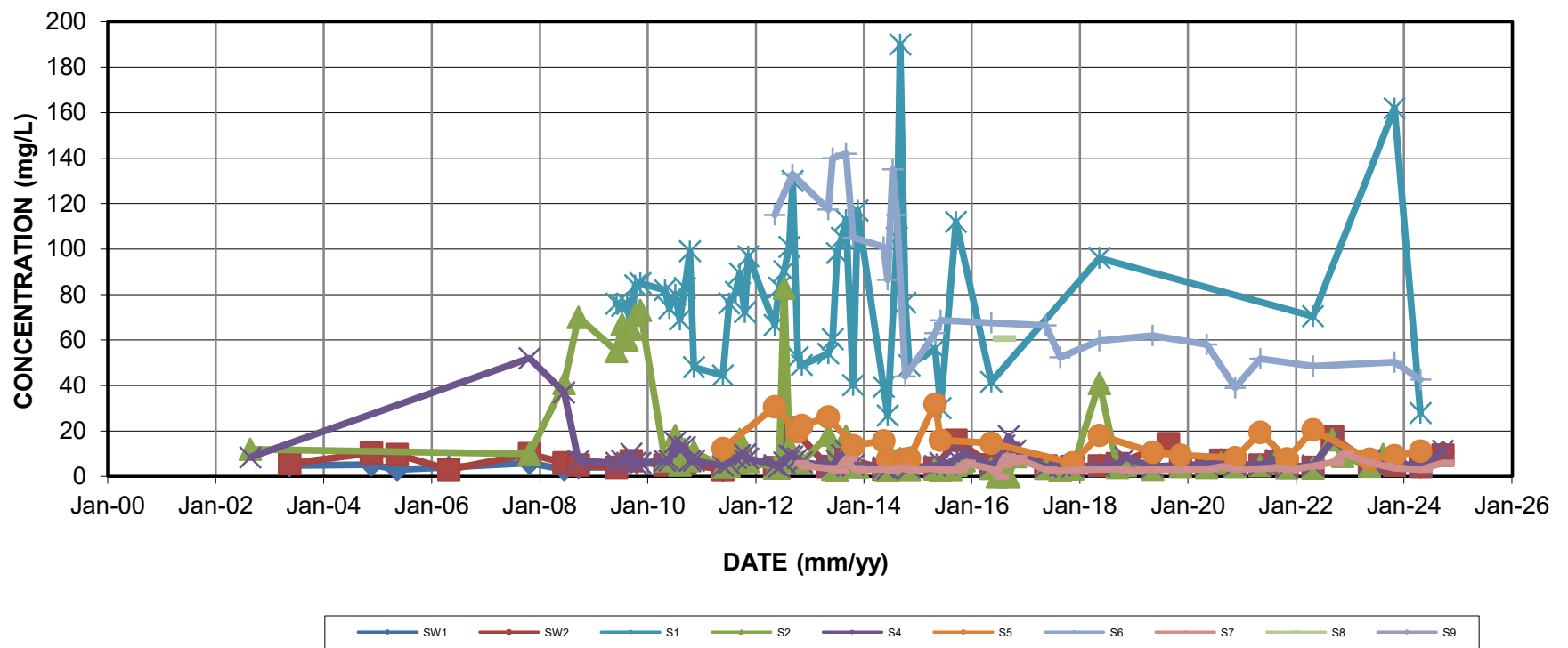
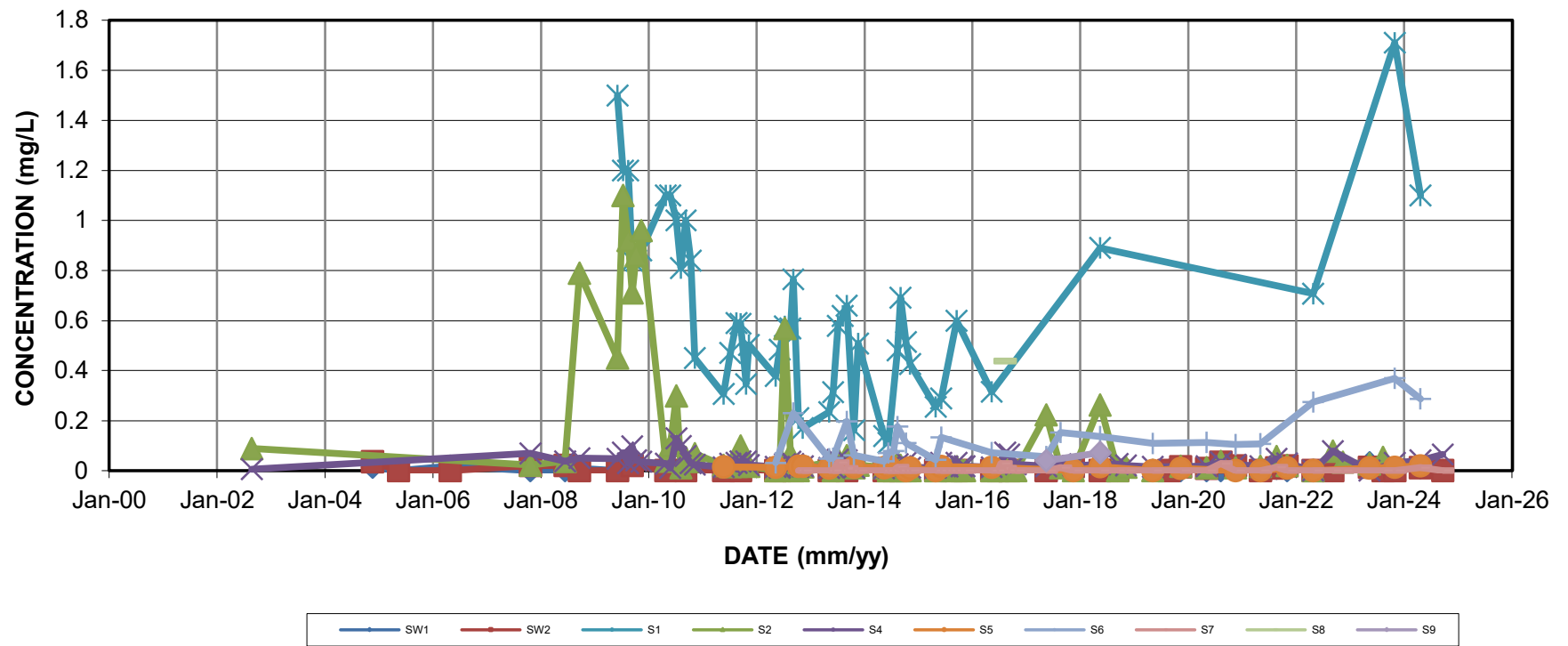


FIGURE F-2
TIME CONCENTRATION GRAPH - Boron



TIME CONCENTRATION GRAPH - Iron

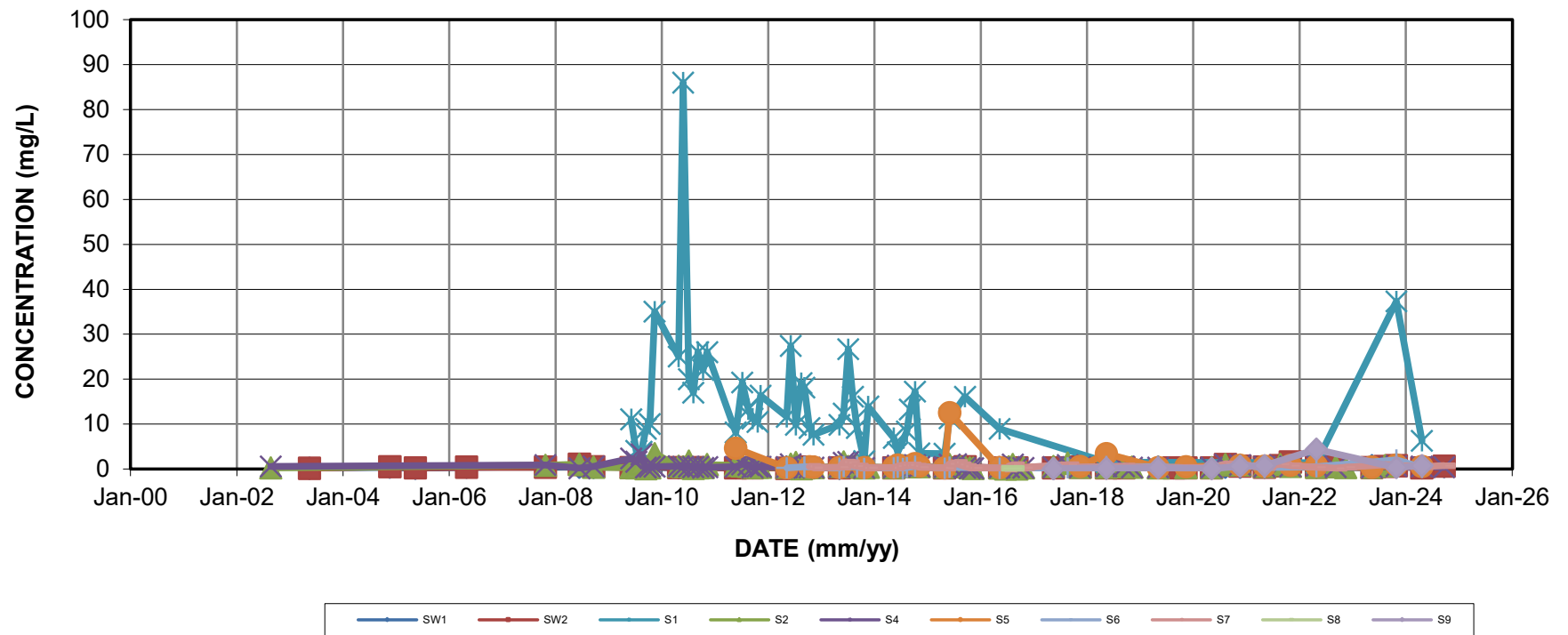


FIGURE F-4
TIME CONCENTRATION GRAPH - Total Phosphorus

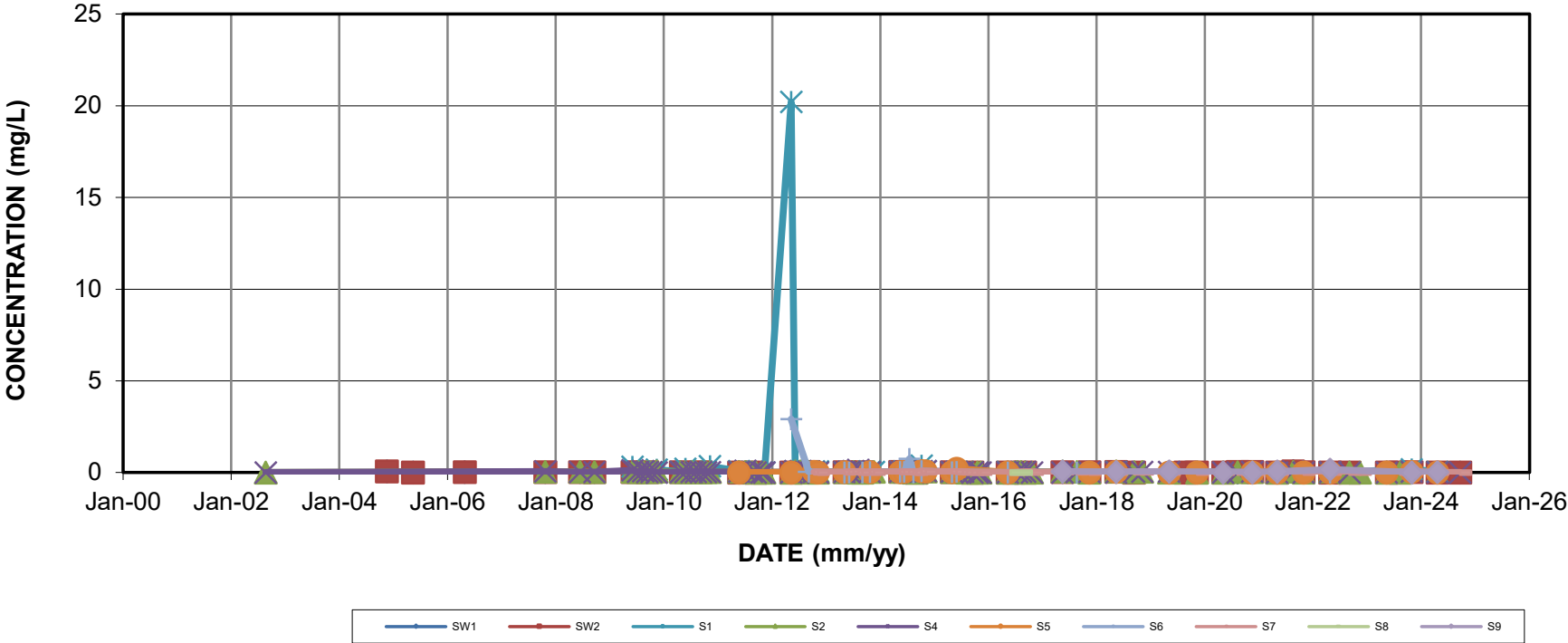


FIGURE F-5
TIME CONCENTRATION GRAPH - Ammonia

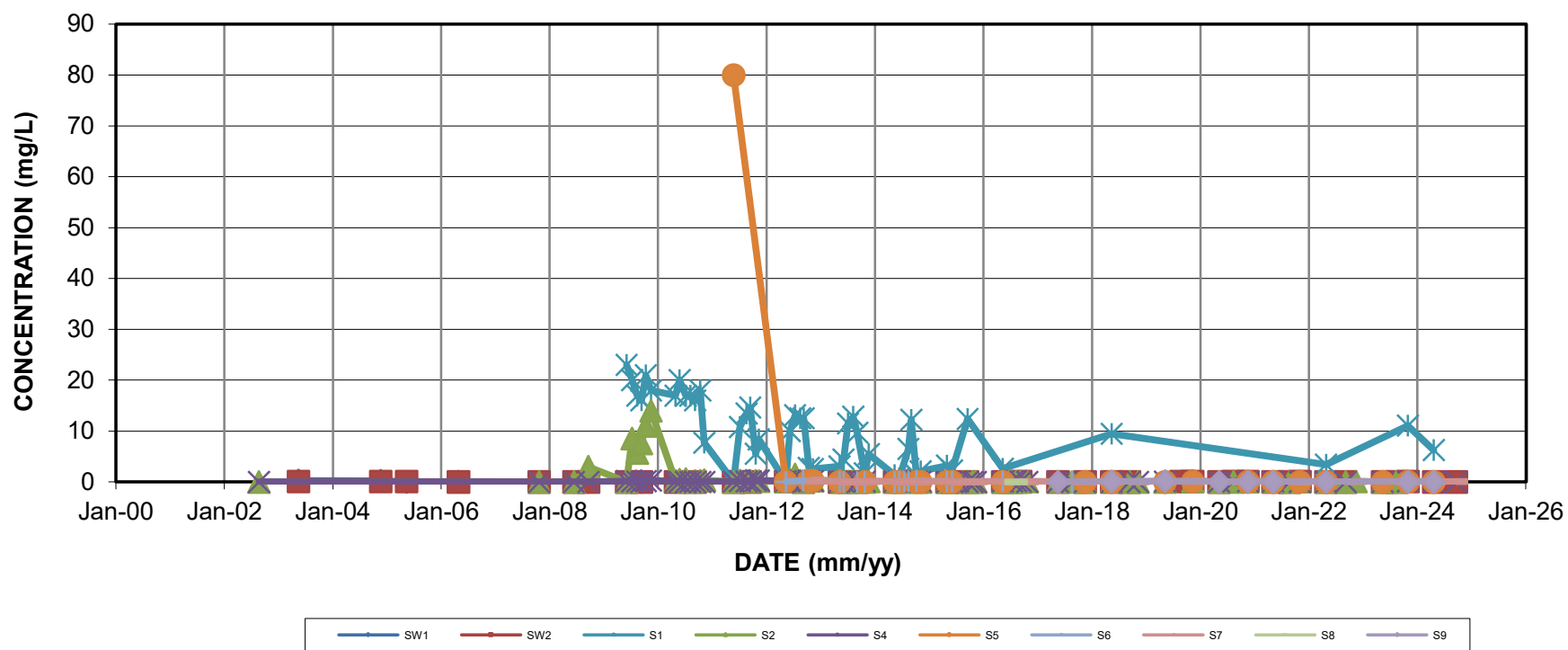


FIGURE F-6
TIME CONCENTRATION GRAPH - TKN

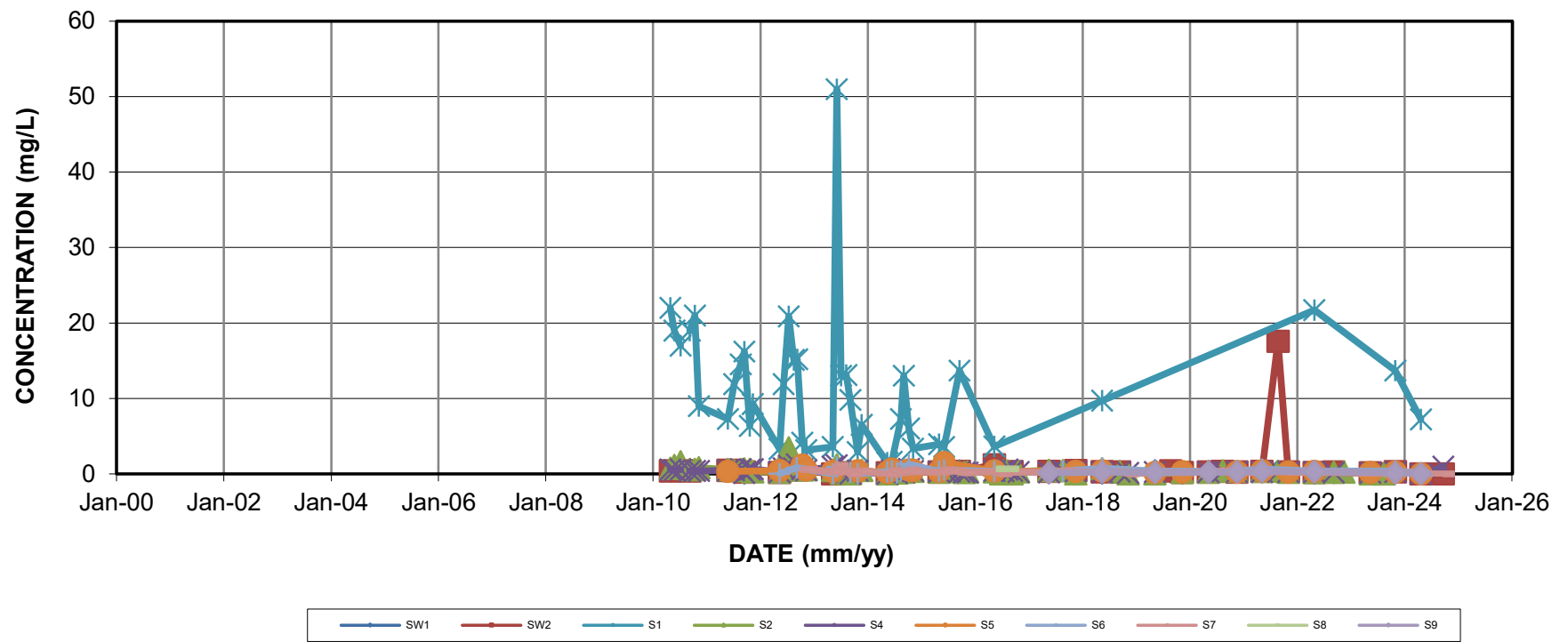
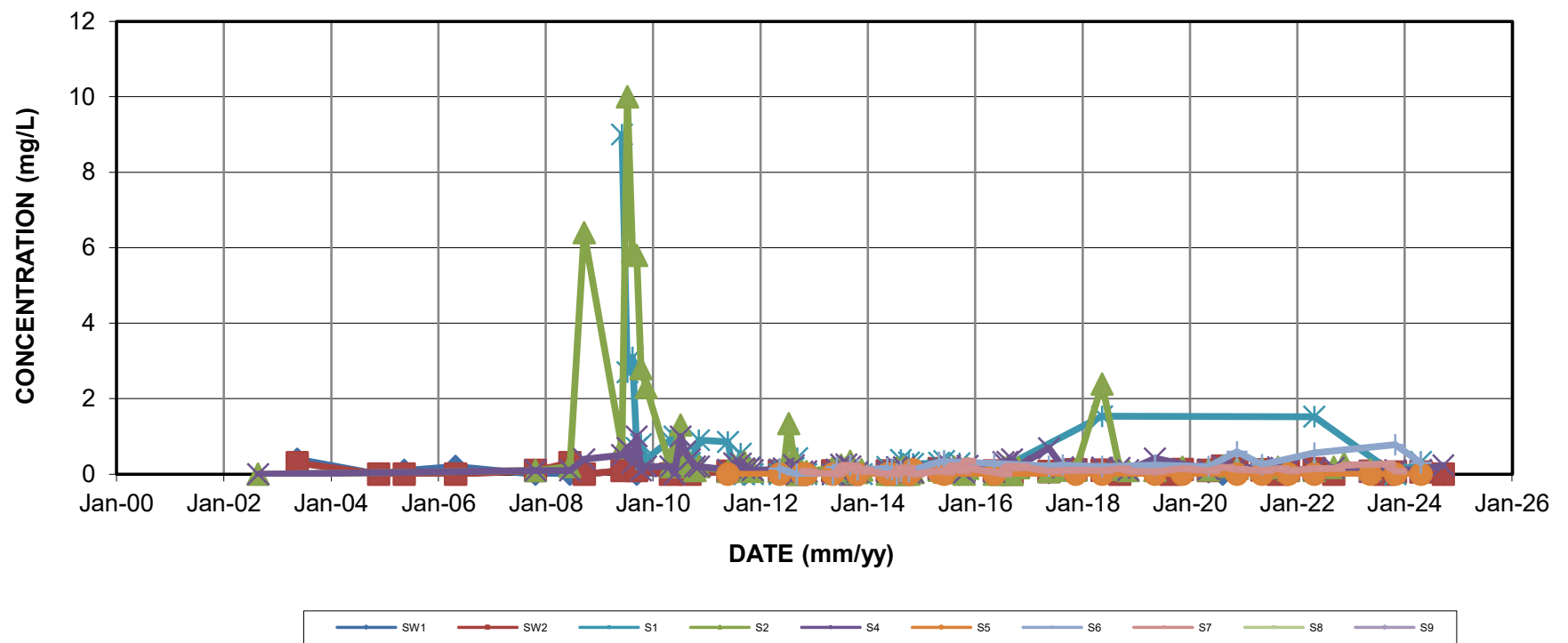
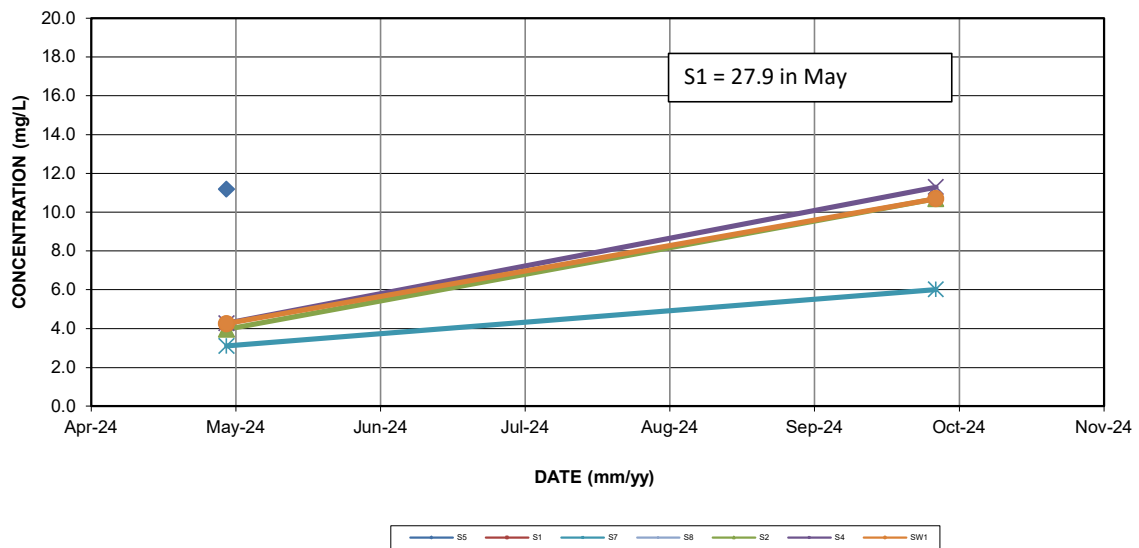


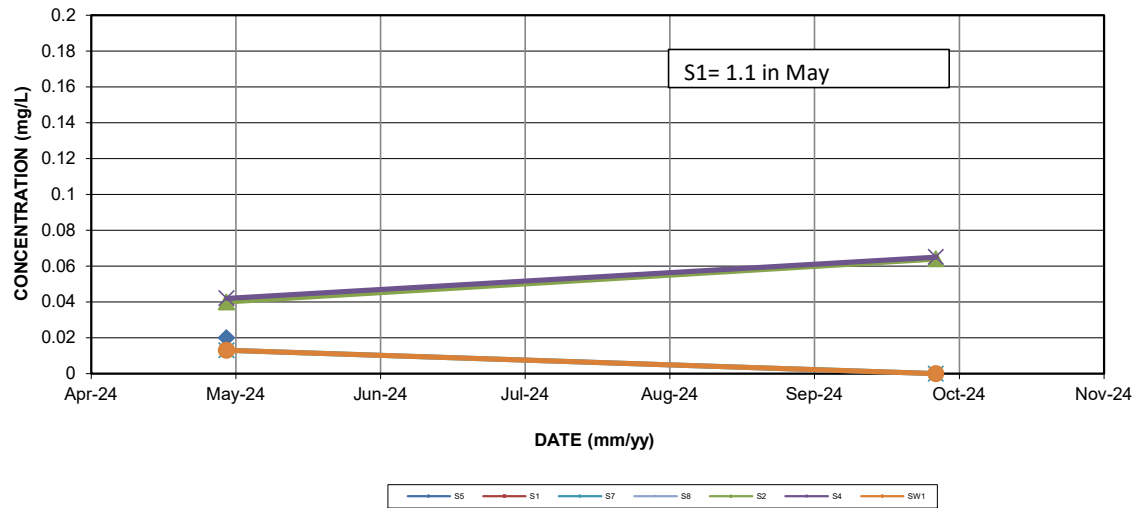
FIGURE F-7
TIME CONCENTRATION GRAPH - Nitrate



**FIGURE F-8
DISTANCE CONCENTRATION GRAPH - Chloride**



**FIGURE F-9
DISTANCE CONCENTRATION GRAPH - Boron**



Appendix G

Laboratory Certificates of Analysis



CLIENT NAME: RESENV CONSULTING LIMITED
BOX 490, 14336 COUNTY ROAD 21
COLBORNE, ON K0K1S0
(905) 836-1119

ATTENTION TO: Jason Balsdon

PROJECT: 13-004-00

AGAT WORK ORDER: 24T146773

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Inorganic Team Lead

DATE REPORTED: May 15, 2024

PAGES (INCLUDING COVER): 9

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

***Notes**

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T146773

PROJECT: 13-004-00

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: RESENV CONSULTING LIMITED

SAMPLING SITE: TRI-R Landfil

ATTENTION TO: Jason Balsdon

SAMPLED BY: JB

Tri-R Committee Landfill - Surface Water Comprehensive Parameters

DATE RECEIVED: 2024-05-03

DATE REPORTED: 2024-05-15

Parameter		SAMPLE DESCRIPTION:		S1		S2		S4		S5		S6		S7		S9	
		SAMPLE TYPE:		Water		Water		Water		Water		Water		Water		Water	
		DATE SAMPLED:	RD	2024-05-01	RD	2024-05-01	RD	2024-05-01	RD	2024-05-01	RD	2024-05-01	RD	2024-05-01	RD	2024-05-01	RD
Unit	G / S	RD	RD	5836281	RD	5836371	RD	5836372	RD	5836373	RD	5836374	RD	5836375	RD	5836376	RD
BOD (5)		2	2	<2	2	<2	2	<2	2	<2	2	<2	2	<2	2	<2	<2
Total Dissolved Solids	mg/L	10	10	490	10	60	10	64	10	56	10	230	10	30	10	114	10
Total Suspended Solids	mg/L	10	10	19	10	<10	10	<10	10	<10	10	10	10	<10	10	26	10
Electrical Conductivity	uS/cm	2	2	878	2	63	2	67	2	115	2	393	2	40	2	202	2
pH	pH Units	6.5-8.5	NA	7.50	NA	7.27	NA	7.20	NA	7.18	NA	7.57	NA	7.03	NA	7.34	NA
Alkalinity (as CaCO ₃)	mg/L	5	5	381	5	17	5	20	5	39	5	66	5	9	5	34	5
Bicarbonate (as CaCO ₃)	mg/L	5	5	381	5	17	5	20	5	39	5	66	5	9	5	34	5
Carbonate (as CaCO ₃)	mg/L	5	5	<5	5	<5	5	<5	5	<5	5	<5	5	<5	5	<5	5
Chloride	mg/L	0.12	0.12	27.9	0.10	3.96	0.10	4.28	0.10	11.2	0.10	42.6	0.10	3.11	0.10	25.5	0.10
Nitrate as N	mg/L	0.05	0.05	0.33	0.05	0.14	0.05	0.12	0.05	<0.05	0.05	0.30	0.05	0.07	0.05	0.21	0.05
Nitrite as N	mg/L	0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05
Sulphate	mg/L	0.10	0.10	51.0	0.10	4.08	0.10	4.87	0.10	2.17	0.10	59.9	0.10	2.83	0.10	26.4	0.10
Ammonia as N	mg/L	0.03	0.03	6.27	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	0.03	0.02	<0.02	0.02	<0.02	0.02
Chemical Oxygen Demand	mg/L	5	5	61	5	15	5	<5	5	29	5	21	5	19	5	26	5
Total Kjeldahl Nitrogen	mg/L	0.10	0.10	7.25	0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	0.15	0.10	<0.10	0.10	<0.10	0.10
Total Phosphorus	mg/L	*	0.02	0.04	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	0.02	0.02
Dissolved Organic Carbon	mg/L	0.5	0.5	22.0	0.5	6.3	0.5	5.8	0.5	8.9	0.5	7.1	0.5	5.7	0.5	5.1	0.5
Phenols	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	<0.001	0.001	<0.001	0.001	0.001	0.001	<0.001	0.001
Total Calcium	mg/L	0.20	0.20	103	0.20	4.98	0.20	5.96	0.20	8.18	0.20	39.3	0.20	3.33	0.20	18.4	0.20
Total Magnesium	mg/L	0.10	0.10	17.3	0.10	1.29	0.10	1.52	0.10	1.10	0.10	5.22	0.10	0.98	0.10	3.05	0.10
Total Potassium	mg/L	0.50	0.50	21.5	0.50	1.21	0.50	1.10	0.50	0.79	0.50	5.06	0.50	<0.50	0.50	3.79	0.50
Total Sodium	mg/L	0.10	0.10	41.3	0.10	3.64	0.10	4.29	0.10	12.4	0.10	35.9	0.10	3.28	0.10	17.9	0.10
Total Arsenic	mg/L	0.1	0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003
Total Barium	mg/L	0.002	0.002	0.149	0.002	0.021	0.002	0.021	0.002	0.031	0.002	0.051	0.002	0.020	0.002	0.044	0.002
Total Boron	mg/L	0.2	0.010	1.10	0.010	0.040	0.010	0.042	0.010	0.020	0.010	0.288	0.010	0.013	0.010	0.135	0.010
Total Cadmium	mg/L	0.0002	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001
Total Chromium	mg/L	0.003	0.003	0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003
Total Copper	mg/L	0.005	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002
Total Iron	mg/L	0.3	0.050	6.20	0.050	0.485	0.050	0.557	0.050	0.507	0.050	0.277	0.050	0.491	0.050	0.708	0.050
Total Lead	mg/L	*	0.0005	0.0006	0.0005	0.0009	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005

Certified By:

Yris Varastegui



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T146773

PROJECT: 13-004-00

5835 COOPERS AVENUE
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CANADA L4Z 1Y2
TEL (905)712-5100
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<http://www.agatlabs.com>

CLIENT NAME: RESENV CONSULTING LIMITED

SAMPLING SITE: TRI-R Landfill

ATTENTION TO: Jason Balsdon

SAMPLED BY: JB

Tri-R Committee Landfill - Surface Water Comprehensive Parameters

DATE RECEIVED: 2024-05-03				DATE REPORTED: 2024-05-15									
SAMPLE DESCRIPTION:				S1	S2	S4	S5	S6	S7	S9			
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water			
DATE SAMPLED:				2024-05-01	2024-05-01	2024-05-01	2024-05-01	2024-05-01	2024-05-01	2024-05-01			
Parameter	Unit	G / S	RDL	5836281	RDL	5836371	5836372	5836373	5836374	5836375	5836376		
Total Mercury	mg/L		0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
Total Zinc	mg/L	0.030	0.020	<0.020	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020		
Lab Filtration DOC				2024/05/06		2024/05/06	2024/05/06	2024/05/06	2024/05/06	2024/05/06	2024/05/06		

Certified By:

Yris Varastegui



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T146773

PROJECT: 13-004-00

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
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<http://www.agatlabs.com>

CLIENT NAME: RESENV CONSULTING LIMITED

SAMPLING SITE: TRI-R Landfill

ATTENTION TO: Jason Balsdon

SAMPLED BY: JB

Tri-R Committee Landfill - Surface Water Comprehensive Parameters									
DATE RECEIVED: 2024-05-03					DATE REPORTED: 2024-05-15				
Parameter	Unit	SAMPLE DESCRIPTION:				SW1		SW2	
		SAMPLE TYPE:		DATE SAMPLED:		Water		Water	
		G / S	RDL	2024-05-01	5836377	2024-05-01	5836378		
BOD (5)	mg/L		2		<2			<2	
Total Dissolved Solids	mg/L		10		42			26	
Total Suspended Solids	mg/L		10		<10			<10	
Electrical Conductivity	uS/cm		2		44			44	
pH	pH Units	6.5-8.5	NA		6.79			6.77	
Alkalinity (as CaCO3)	mg/L		5		8			7	
Bicarbonate (as CaCO3)	mg/L		5		8			7	
Carbonate (as CaCO3)	mg/L		5		<5			<5	
Chloride	mg/L		0.10		4.26			4.34	
Nitrate as N	mg/L		0.05		0.06			0.06	
Nitrite as N	mg/L		0.05		<0.05			<0.05	
Sulphate	mg/L		0.10		3.65			3.57	
Ammonia as N	mg/L		0.02		<0.02			<0.02	
Chemical Oxygen Demand	mg/L		5		16			17	
Total Kjeldahl Nitrogen	mg/L		0.10		<0.10			<0.10	
Total Phosphorus	mg/L	*	0.02		<0.02			<0.02	
Dissolved Organic Carbon	mg/L		0.5		5.3			5.5	
Phenols	mg/L	0.001	0.001		<0.001			0.001	
Total Calcium	mg/L		0.20		3.26			3.62	
Total Magnesium	mg/L		0.10		0.95			0.51	
Total Potassium	mg/L		0.50		<0.50			0.65	
Total Sodium	mg/L		0.10		4.88			3.40	
Total Arsenic	mg/L	0.1	0.003		<0.003			<0.003	
Total Barium	mg/L		0.002		0.012			0.011	
Total Boron	mg/L	0.2	0.010		0.013			0.012	
Total Cadmium	mg/L	0.0002	0.0001		<0.0001			<0.0001	
Total Chromium	mg/L		0.003		<0.003			<0.003	
Total Copper	mg/L	0.005	0.002		<0.002			<0.002	
Total Iron	mg/L	0.3	0.050		0.211			0.212	
Total Lead	mg/L	*	0.0005		<0.0005			<0.0005	

Certified By:

José Varastegui



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T146773

PROJECT: 13-004-00

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CLIENT NAME: RESENV CONSULTING LIMITED

SAMPLING SITE: TRI-R Landfil

ATTENTION TO: Jason Balsdon

SAMPLED BY: JB

Tri-R Committee Landfill - Surface Water Comprehensive Parameters					
DATE RECEIVED: 2024-05-03			DATE REPORTED: 2024-05-15		
SAMPLE DESCRIPTION:					
SAMPLE TYPE:		SW1		SW2	
DATE SAMPLED:		Water		Water	
G / S		2024-05-01		2024-05-01	
Parameter	Unit	RDL	5836377	RDL	5836378
Total Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001
Total Zinc	mg/L	0.030	0.020	<0.020	<0.020
Lab Filtration DOC			2024/05/06		2024/05/06

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to PWQO * Variable - refer to guideline reference document
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.
5836281-5836378 DOC analysis completed on a lab filtered sample.
Dilution required, RDL has been increased accordingly.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

José Varastegui



AGAT Laboratories

Exceedance Summary

AGAT WORK ORDER: 24T146773

PROJECT: 13-004-00

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CLIENT NAME: RESENV CONSULTING LIMITED

ATTENTION TO: Jason Balsdon

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
5836281	S1	ON PWQO	Tri-R Committee Landfill - Surface Water Comprehensive Parameters	Total Boron	mg/L	0.2	1.10
5836281	S1	ON PWQO	Tri-R Committee Landfill - Surface Water Comprehensive Parameters	Total Iron	mg/L	0.3	6.20
5836371	S2	ON PWQO	Tri-R Committee Landfill - Surface Water Comprehensive Parameters	Total Iron	mg/L	0.3	0.485
5836372	S4	ON PWQO	Tri-R Committee Landfill - Surface Water Comprehensive Parameters	Total Iron	mg/L	0.3	0.557
5836373	S5	ON PWQO	Tri-R Committee Landfill - Surface Water Comprehensive Parameters	Total Iron	mg/L	0.3	0.507
5836374	S6	ON PWQO	Tri-R Committee Landfill - Surface Water Comprehensive Parameters	Total Boron	mg/L	0.2	0.288
5836375	S7	ON PWQO	Tri-R Committee Landfill - Surface Water Comprehensive Parameters	Total Iron	mg/L	0.3	0.491
5836376	S9	ON PWQO	Tri-R Committee Landfill - Surface Water Comprehensive Parameters	Total Iron	mg/L	0.3	0.708



Quality Assurance

CLIENT NAME: RESENV CONSULTING LIMITED

PROJECT: 13-004-00

SAMPLING SITE: TRI-R Landfil

AGAT WORK ORDER: 24T146773

ATTENTION TO: Jason Balsdon

SAMPLED BY: JB

Water Analysis

RPT Date: May 15, 2024

DUPLICATE

REFERENCE MATERIAL

METHOD BLANK SPIKE

MATRIX SPIKE

PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value			Recovery	Acceptable Limits		Recovery	Acceptable Limits	
							Lower	Upper			Lower	Upper		Lower	Upper

Tri-R Committee Landfill - Surface Water Comprehensive Parameters

BOD (5)	5836240		<2	<2	NA	< 2	101%	75%	125%						
Total Dissolved Solids	5840646		582	618	6.0%	< 10	94%	80%	120%						
Total Suspended Solids	5836132		<10	<10	NA	< 10	100%	80%	120%						
Electrical Conductivity	5837079		11700	11000	6.2%	< 2	97%	80%	120%						
pH	5837079		7.04	7.14	1.4%	NA	100%	90%	110%						
Alkalinity (as CaCO3)	5837079		409	411	0.5%	< 5	106%	80%	120%						
Bicarbonate (as CaCO3)	5837079		409	411	0.5%	< 5	NA	80%	120%						
Carbonate (as CaCO3)	5837079		<5	<5	NA	< 5	NA	80%	120%						
Chloride	5836899		45.6	45.3	0.7%	< 0.10	94%	70%	130%	101%	80%	120%	107%	70%	130%
Nitrate as N	5836899		1.40	1.36	2.9%	< 0.05	95%	70%	130%	95%	80%	120%	97%	70%	130%
Nitrite as N	5836899		<0.05	<0.05	NA	< 0.05	95%	70%	130%	94%	80%	120%	97%	70%	130%
Sulphate	5836899		7.87	7.78	1.2%	< 0.10	92%	70%	130%	96%	80%	120%	98%	70%	130%
Ammonia as N	5852783		0.04	0.06	NA	< 0.02	104%	70%	130%	102%	80%	120%	91%	70%	130%
Chemical Oxygen Demand	5833601		<5	<5	NA	< 5	99%	90%	110%	103%	90%	110%	113%	70%	130%
Total Kjeldahl Nitrogen	5822121		3.37	3.22	4.6%	< 0.10	102%	70%	130%	100%	80%	120%	93%	70%	130%
Total Phosphorus	5846273		<0.02	<0.02	NA	< 0.02	97%	70%	130%	105%	80%	120%	93%	70%	130%
Dissolved Organic Carbon	5833601		1.0	0.9	NA	< 0.5	92%	90%	110%	102%	90%	110%	105%	80%	120%
Phenols	5836281	5836281	0.001	0.001	NA	< 0.001	95%	90%	110%	92%	90%	110%	103%	80%	120%
Total Calcium	5836899		130	127	2.3%	< 0.20	107%	70%	130%	101%	80%	120%	102%	70%	130%
Total Magnesium	5836899		15.6	15.9	1.9%	< 0.10	116%	70%	130%	114%	80%	120%	101%	70%	130%
Total Potassium	5836899		1.13	1.20	NA	< 0.50	123%	70%	130%	108%	80%	120%	103%	70%	130%
Total Sodium	5836899		42.5	36.7	14.6%	< 0.10	119%	70%	130%	118%	80%	120%	121%	70%	130%
Total Arsenic	5836899		<0.003	<0.003	NA	< 0.003	96%	70%	130%	86%	80%	120%	83%	70%	130%
Total Barium	5836899		0.075	0.075	0.0%	< 0.002	101%	70%	130%	101%	80%	120%	87%	70%	130%
Total Boron	5836899		0.020	0.013	NA	< 0.010	101%	70%	130%	99%	80%	120%	90%	70%	130%
Total Cadmium	5836899		<0.0001	<0.0001	NA	< 0.0001	101%	70%	130%	99%	80%	120%	83%	70%	130%
Total Chromium	5836899		<0.003	<0.003	NA	< 0.003	102%	70%	130%	98%	80%	120%	87%	70%	130%
Total Copper	5836899		<0.002	<0.002	NA	< 0.002	101%	70%	130%	99%	80%	120%	85%	70%	130%
Total Iron	5836899		0.075	0.067	NA	< 0.050	97%	70%	130%	95%	80%	120%	85%	70%	130%
Total Lead	5836899		<0.0005	<0.0005	NA	< 0.0005	97%	70%	130%	92%	80%	120%	79%	70%	130%
Total Mercury	5836281	5836281	<0.0001	<0.0001	NA	< 0.0001	104%	70%	130%	102%	80%	120%	96%	70%	130%
Total Zinc	5836899		<0.020	<0.020	NA	< 0.020	100%	70%	130%	94%	80%	120%	84%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By:

Joris Veraestegui



Method Summary

CLIENT NAME: RESENV CONSULTING LIMITED

PROJECT: 13-004-00

SAMPLING SITE: TRI-R Landfil

AGAT WORK ORDER: 24T146773

ATTENTION TO: Jason Balsdon

SAMPLED BY: JB

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
BOD (5)	INOR-93-6006	Modified from SM 5210 B	DO METER
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C, D	BALANCE
Total Suspended Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C, D	BALANCE
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
Alkalinity (as CaCO ₃)	INOR-93-6000	Modified from SM 2320 B	PC TITRATE
Bicarbonate (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Carbonate (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH ₃ H	LACHAT FIA
Chemical Oxygen Demand	INOR-93-6042	modified from SM 5220 A and SM 5220 D	SPECTROPHOTOMETER
Total Kjeldahl Nitrogen	INOR-93-6048	modified from EPA 351.2 and SM 4500-NORG D	LACHAT FIA
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-93-6049	modified from SM 5310 B	SHIMADZU CARBON ANALYZER
Phenols	INOR-93-6072	modified from SM 5530 D	LACHAT FIA
Total Calcium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Magnesium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Potassium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Sodium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Barium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Boron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Iron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Lab Filtration DOC	SR-78-9001		FILTRATION



CLIENT NAME: RESENV CONSULTING LIMITED
BOX 490, 14336 COUNTY ROAD 21
COLBORNE, ON K0K1S0
(905) 836-1119

ATTENTION TO: Jason Balsdon

PROJECT: 13-004-00

AGAT WORK ORDER: 24T146775

WATER ANALYSIS REVIEWED BY: Nivine Basily, Inorganic Team Lead

DATE REPORTED: May 16, 2024

PAGES (INCLUDING COVER): 7

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

***Notes**

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T146775

PROJECT: 13-004-00

5835 COOPERS AVENUE
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<http://www.agatlabs.com>

CLIENT NAME: RESENV CONSULTING LIMITED

SAMPLING SITE: TRI-R Landfill

ATTENTION TO: Jason Balsdon

SAMPLED BY: JB

Tri-R Committee Landfill - Groundwater Indicator Parameters															
DATE RECEIVED: 2024-05-03				DATE REPORTED: 2024-05-16											
		SAMPLE DESCRIPTION:		BH2		BH3		BH03-1		BH03-2		BH07-1		BH07-2	
		SAMPLE TYPE:		Water		Water		Water		Water		Water		Water	
		DATE SAMPLED:		2024-05-01		2024-05-01		2024-05-01		2024-05-01		2024-05-01		2024-05-01	
Parameter	Unit	G / S	RDL	5836414	5836446	RDL	5836447	5836448	5836449	5836450					
Total Dissolved Solids	mg/L	10	728	10	1100	10	26	30	246	108					
Electrical Conductivity	uS/cm	2	1110	2	1690	2	33	33	483	187					
pH	pH Units	NA	6.76	NA	6.97	NA	6.19	6.21	7.96	7.48					
Alkalinity (as CaCO3)	mg/L	5	404	5	408	5	10	9	194	67					
Bicarbonate (as CaCO3)	mg/L	5	404	5	408	5	10	9	194	67					
Carbonate (as CaCO3)	mg/L	5	<5	5	<5	5	<5	<5	<5	<5					
Chloride	mg/L	0.12	158	0.24	173	0.10	1.37	0.85	30.0	10.9					
Nitrate as N	mg/L	0.05	<0.05	0.07	<0.07	0.05	<0.05	<0.05	<0.05	<0.05					
Sulphate	mg/L	0.10	38.3	0.19	254	0.10	3.84	5.14	20.9	9.89					
Ammonia as N	mg/L	0.02	0.07	0.03	5.29	0.02	<0.02	<0.02	<0.02	<0.02					
Dissolved Calcium	mg/L	0.05	58.7	0.05	80.9	0.05	1.40	1.88	48.0	16.4					
Dissolved Magnesium	mg/L	0.05	9.80	0.05	21.9	0.05	0.50	0.55	8.69	2.90					
Dissolved Potassium	mg/L	0.50	5.48	0.50	32.4	0.50	<0.50	<0.50	2.62	0.69					
Dissolved Sodium	mg/L	0.05	120	0.05	105	0.05	1.71	2.16	6.65	3.37					
Dissolved Barium	mg/L	0.002	0.101	0.002	0.119	0.002	0.013	0.006	0.335	0.192					
Dissolved Boron	mg/L	0.010	0.453	0.010	0.387	0.010	0.030	0.022	0.048	0.034					
Dissolved Iron	mg/L	0.020	6.55	0.020	9.42	0.020	<0.020	0.027	<0.020	<0.020					
Dissolved Zinc	mg/L	0.005	0.006	0.005	0.018	0.005	0.006	<0.005	0.022	<0.005					



Certified By:

Neil B. Smith



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T146775

PROJECT: 13-004-00

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CLIENT NAME: RESENV CONSULTING LIMITED

SAMPLING SITE: TRI-R Landfill

ATTENTION TO: Jason Balsdon

SAMPLED BY: JB

Tri-R Committee Landfill - Groundwater Indicator Parameters														
DATE RECEIVED: 2024-05-03					DATE REPORTED: 2024-05-16									
Parameter	SAMPLE DESCRIPTION:				BH07-3		BH10-1		BH10-2		BH15-2		BH15-3	
	SAMPLE TYPE:				Water		Water		Water		Water		Water	
	DATE SAMPLED:				2024-05-01		2024-05-01		2024-05-01		2024-05-01		2024-05-01	
	G / S	RDL	5836451	5836452	5836453	5836454	5836455	5836456						
Total Dissolved Solids	Unit	10	202	224	108	18	250	100						
Electrical Conductivity	mg/L	2	288	369	146	42	430	142						
pH	uS/cm	NA	6.69	6.58	6.67	6.33	7.27	6.79						
Alkalinity (as CaCO3)	pH Units	5	30	62	59	17	134	60						
Bicarbonate (as CaCO3)	mg/L	5	30	62	59	17	134	60						
Carbonate (as CaCO3)	mg/L	5	<5	<5	<5	<5	<5	<5						
Chloride	mg/L	0.10	63.0	43.5	10.7	0.65	33.6	11.9						
Nitrate as N	mg/L	0.05	0.21	0.14	<0.05	<0.05	0.18	<0.05						
Sulphate	mg/L	0.10	4.99	67.1	3.79	3.04	52.4	6.29						
Ammonia as N	mg/L	0.02	<0.02	<0.02	0.33	<0.02	0.02	0.33						
Dissolved Calcium	mg/L	0.05	13.6	22.6	7.35	2.56	13.7	8.94						
Dissolved Magnesium	mg/L	0.05	6.11	6.81	4.07	0.64	2.78	3.90						
Dissolved Potassium	mg/L	0.50	1.20	2.62	0.60	0.55	1.04	<0.50						
Dissolved Sodium	mg/L	0.05	10.8	23.4	8.71	1.06	97.6	10.7						
Dissolved Barium	mg/L	0.002	0.022	0.076	0.021	0.023	0.023	0.020						
Dissolved Boron	mg/L	0.010	0.022	0.239	0.020	0.012	0.305	0.017						
Dissolved Iron	mg/L	0.020	0.035	0.071	20.3	0.036	0.086	20.9						
Dissolved Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005						

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5836414-5836456 Metals analysis completed on a filtered sample.

Dilution required, RDL has been increased accordingly.

Analysis performed at AGAT Toronto (unless marked by *)



Certified By:

Quality Assurance

CLIENT NAME: RESENV CONSULTING LIMITED

PROJECT: 13-004-00

SAMPLING SITE: TRI-R Landfill

AGAT WORK ORDER: 24T146775

ATTENTION TO: Jason Balsdon

SAMPLED BY: JB

Water Analysis															
RPT Date: May 16, 2024			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Tri-R Committee Landfill - Groundwater Indicator Parameters

Total Dissolved Solids	5836414	5836414	728	716	1.7%	< 10	94%	80%	120%						
Electrical Conductivity	5838267		1320	1320	0.0%	< 2	99%	80%	120%						
pH	5838267		7.96	8.05	1.1%	NA	99%	90%	110%						
Alkalinity (as CaCO3)	5838267		121	123	1.6%	< 5	107%	80%	120%						
Bicarbonate (as CaCO3)	5838267		121	123	1.6%	< 5	NA	80%	120%						
Carbonate (as CaCO3)	5838267		<5	<5	NA	< 5	NA	80%	120%						
Chloride	5836446	5836446	173	170	1.7%	< 0.10	94%	70%	130%	101%	80%	120%	104%	70%	130%
Nitrate as N	5836446	5836446	<0.07	<0.07	NA	< 0.05	93%	70%	130%	95%	80%	120%	98%	70%	130%
Sulphate	5836446	5836446	254	249	2.0%	< 0.10	92%	70%	130%	96%	80%	120%	NA	70%	130%
Ammonia as N	5836414	5836414	0.07	0.07	NA	< 0.02	105%	70%	130%	102%	80%	120%	79%	70%	130%
Dissolved Calcium	5837079		745	710	4.8%	< 0.05	85%	70%	130%	90%	80%	120%	80%	70%	130%
Dissolved Magnesium	5837079		85.4	79.7	6.9%	< 0.05	101%	70%	130%	102%	80%	120%	73%	70%	130%
Dissolved Potassium	5837079		2.57	2.73	6.0%	< 0.50	104%	70%	130%	108%	80%	120%	NA	70%	130%
Dissolved Sodium	5837079		1380	1470	6.3%	< 0.05	119%	70%	130%	118%	80%	120%	NA	70%	130%
Dissolved Barium	5837079		0.179	0.179	0.0%	< 0.002	107%	70%	130%	110%	80%	120%	119%	70%	130%
Dissolved Boron	5837079		0.034	0.029	NA	< 0.010	99%	70%	130%	103%	80%	120%	101%	70%	130%
Dissolved Iron	5837079		0.042	0.047	NA	< 0.010	103%	70%	130%	114%	80%	120%	123%	70%	130%
Dissolved Zinc	5837079		0.012	0.023	NA	< 0.005	97%	70%	130%	111%	80%	120%	95%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate NA: results are under 5X the RDL and will not be calculated.

Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

Certified By:


Nivine Basily



Method Summary

CLIENT NAME: RESENV CONSULTING LIMITED

AGAT WORK ORDER: 24T146775

PROJECT: 13-004-00

ATTENTION TO: Jason Balsdon

SAMPLING SITE: TRI-R Landfill

SAMPLED BY: JB

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C, D	BALANCE
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
Alkalinity (as CaCO ₃)	INOR-93-6000	Modified from SM 2320 B	PC TITRATE
Bicarbonate (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Carbonate (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH ₃ H	LACHAT FIA
Dissolved Calcium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP/MS
Dissolved Magnesium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Dissolved Potassium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP/MS
Dissolved Sodium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Barium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Boron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Iron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Zinc	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS



Laboratories



Have feedback?
Scan here for a
quick survey!

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
web@earth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: ResEnv Consulting Limited
Contact: JASON BALSBERG
Address: 14336 County Road 21
Colborne ON K0K 1S0
Phone: 905-836-1119 Fax: 905-836-1119
Reports to be sent to:
1. Email: resenvucl@gmail.com
2. Email:

Project Information:

Project: 13-004-00
Site Location: TR-12 Caribou
Sampled By: STB
AGAT Quote #: 18113077030
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Company:
Contact:
Address:
Email:
Bill To Same: Yes ☒ No ☐

Regulatory Requirements:

(Please check all applicable boxes)
☐ Regulation 153/04 ☐ Regulation 406
Table Indicate One
☐ Ind/Com ☐ Sanitary ☐ Storm
☐ Res/Park ☐ Prov. Water Quality Objectives (PWQO)
☐ Agriculture ☐ Other
Soil Texture (Check One)
☐ Coarse ☐ Fine
☐ CCME

Is this submission for a Record of Site Condition (RSC)?

☐ Yes ☒ No

Report Guideline on Certificate of Analysis

☐ Yes ☒ No

Legal Sample

☐

Sample Matrix Legend

GW Ground Water SD Sediment
O Oil SW Surface Water
P Paint R Rock/Shale
S Soil

Sample Matrix
Date Sampled
Time Sampled
of Containers

Comments/
Special Instructions

Field Filtered - Metals, Hg, Cu, DOC
N / Y

Metals & Inorganics
Metals - ☐ Cu, ☐ Hg, ☐ HWSB
BTEX, F1-F4 PHCs
VOC
PAHs
PCBs: Aroclors ☐

Regulation 406 Characterization Package
pH, Metals, BTEX, F1-F4
EC, SAR
Regulation 406 SPLP Rainwater Leach
mSPLP ☐ Metals ☐ VOCs ☐ SVOCs ☐ OC
Landfill Disposal Characterization TCLP
TCLP ☐ M&I ☐ VOCs ☐ ABNs ☐ BAP ☐ PCBs
Corrosivity: ☐ Moisture ☐ Sulphide

O. Reg 406
O. Reg 453
O. Reg 458

Potentially Hazardous or High Concentration (Y/N)

1. B415-3
2. Duo
3. 4
4. 4
5. 4
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7. 4
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10. 4
11. 4

3415-3
Duo
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Comments/
Special Instructions

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N / Y

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O. Reg 406
O. Reg 453
O. Reg 458

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3415-3
Duo
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Comments/
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O. Reg 406
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O. Reg 458

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3415-3
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Potentially Hazardous or High Concentration (Y/N)

1. B415-3
2. Duo
3. 4
4. 4
5.



CLIENT NAME: RESENV CONSULTING LIMITED
BOX 490, 14336 COUNTY ROAD 21
COLBORNE, ON K0K1S0
(905) 836-1119

ATTENTION TO: JASON BALSDON

PROJECT: 13-004-00

AGAT WORK ORDER: 24T203830

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Inorganic Team Lead

DATE REPORTED: Oct 15, 2024

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

***Notes**

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information is available on request from AGAT Laboratories, in accordance with ISO/IEC 17025:2017, ISO/IEC 17025:2005 (Quebec), DR-12-PALA and/or NELAP Standards.
- This document is signed by an authorized signatory who meets the requirements of the MELCCFP, CALA, CCN and NELAP.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T203830

PROJECT: 13-004-00

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: RESENV CONSULTING LIMITED
SAMPLING SITE: Tri-R Landfill

ATTENTION TO: JASON BALSDON
SAMPLED BY: JTB

TSS (Water)				DATE REPORTED: 2024-10-15
DATE RECEIVED: 2024-10-02		SAMPLE DESCRIPTION: BH15-1		
		SAMPLE TYPE:	Water	
		DATE SAMPLED:	2024-09-30	
Parameter	Unit	G / S	RDL	
Total Suspended Solids	mg/L	10	6190810	212

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Yris Varastegui



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T203830

PROJECT: 13-004-00

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: RESENV CONSULTING LIMITED

SAMPLING SITE: Tri-R Landfill

ATTENTION TO: JASON BALSDON

SAMPLED BY: JTB

Tri-R Committee Landfill - Groundwater Comprehensive Parameters

DATE RECEIVED: 2024-10-02				DATE REPORTED: 2024-10-15											
Parameter	Unit	SAMPLE DESCRIPTION:				BH03-1		BH07-1		BH03-2		BH07-2		BH15-1	
		SAMPLE TYPE:		DATE SAMPLED:		Water		Water		Water		Water		Water	
		G / S	RDL	2024-09-30	6190805	2024-09-30	6190806	2024-09-30	6190807	2024-09-30	6190808	2024-09-30	6190810		
Total Dissolved Solids	mg/L	10	232	20	228	30	100	100	860						
Electrical Conductivity	uS/cm	2	425	34	425	44	217	217	2170						
pH	pH Units	NA	7.52	5.75	7.69	6.01	7.13	7.13	6.73						
Alkalinity (as CaCO3)	mg/L	5	170	9	174	10	70	70	931						
Bicarbonate (as CaCO3)	mg/L	5	170	9	174	10	70	70	931						
Carbonate (as CaCO3)	mg/L	5	<5	<5	<5	<5	<5	<5	<5						
Chloride	mg/L	0.10	30.0	2.67	29.8	1.61	15.7	15.7	80.0						
Nitrate as N	mg/L	0.05	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.14						
Nitrite as N	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.11						
Sulphate	mg/L	0.10	21.8	5.75	21.8	7.67	15.0	15.0	10.5						
Ammonia as N	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	91.4						
Chemical Oxygen Demand	mg/L	5	13	15	12	7	10	10	223						
Total Kjeldahl Nitrogen	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	103						
Total Phosphorus	mg/L	0.02	0.07	0.30	0.07	0.67	0.05	0.05	0.25						
Dissolved Organic Carbon	mg/L	0.5	1.3	2.0	1.2	2.9	0.8	0.8	51.4						
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003						
Dissolved Calcium	mg/L	0.05	69.9	2.34	68.7	3.53	25.0	25.0	114						
Dissolved Magnesium	mg/L	0.05	12.3	0.74	11.7	1.00	4.60	4.60	34.7						
Dissolved Potassium	mg/L	0.50	4.03	<0.50	3.76	0.59	1.89	1.89	77.4						
Dissolved Sodium	mg/L	0.05	9.90	2.68	9.40	3.45	5.69	5.69	96.0						
Dissolved Arsenic	mg/L	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.006						
Dissolved Barium	mg/L	0.002	0.340	0.017	0.328	0.011	0.237	0.237	0.126						
Dissolved Boron	mg/L	0.010	0.044	<0.010	0.031	0.011	0.027	0.027	1.38						
Dissolved Cadmium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002						
Dissolved Chromium	mg/L	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.006						
Dissolved Copper	mg/L	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.007						
Dissolved Iron	mg/L	0.010	<0.010	0.021	<0.010	0.055	<0.010	<0.010	56.6						
Dissolved Lead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002						
Dissolved Manganese	mg/L	0.002	0.028	0.009	0.020	0.007	<0.002	<0.002	2.14						
Dissolved Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001						

Certified By:

Yris Varastegui



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T203830

PROJECT: 13-004-00

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: RESENV CONSULTING LIMITED

SAMPLING SITE: Tri-R Landfill

ATTENTION TO: JASON BALSDON

SAMPLED BY: JTB

Tri-R Committee Landfill - Groundwater Comprehensive Parameters									
DATE RECEIVED: 2024-10-02				DATE REPORTED: 2024-10-15					
SAMPLE DESCRIPTION:									
SAMPLE TYPE:									
DATE SAMPLED:									
G / S									
RDL									
Unit									
mg/L									
Dissolved Zinc		0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.010	0.056

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

6190793-6190808 Metals analysis completed on a filtered sample.

6190810 Metals analysis completed on a filtered sample.

Dilution required, RDL has been increased accordingly.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Yris Varastegui



Quality Assurance

CLIENT NAME: RESENV CONSULTING LIMITED

PROJECT: 13-004-00

SAMPLING SITE: Tri-R Landfill

AGAT WORK ORDER: 24T203830

ATTENTION TO: JASON BALSDON

SAMPLED BY: JTB

Water Analysis															
RPT Date: Oct 15, 2024			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Tri-R Committee Landfill - Groundwater Comprehensive Parameters

Total Dissolved Solids	6189116		350	358	2.3%	< 10	100%	80%	120%						
Electrical Conductivity	6190793	6190793	425	425	0.0%	< 2	106%	80%	120%						
pH	6190793	6190793	7.52	7.75	3.0%	NA	100%	90%	110%						
Alkalinity (as CaCO3)	6190793	6190793	170	174	2.3%	< 5	100%	80%	120%						
Bicarbonate (as CaCO3)	6190793	6190793	170	174	2.3%	< 5	NA	80%	120%						
Carbonate (as CaCO3)	6190793	6190793	<5	<5	NA	< 5	NA	80%	120%						
Chloride	6191195		131	133	1.5%	< 0.10	94%	70%	130%	101%	80%	120%	104%	70%	130%
Nitrate as N	6191195		149	151	1.3%	< 0.05	99%	70%	130%	101%	80%	120%	NA	70%	130%
Nitrite as N	6191195		<0.05	<0.05	NA	< 0.05	96%	70%	130%	95%	80%	120%	93%	70%	130%
Sulphate	6191195		253	254	0.4%	< 0.10	98%	70%	130%	99%	80%	120%	NA	70%	130%
Ammonia as N	6192280		<0.02	<0.02	NA	< 0.02	108%	70%	130%	107%	80%	120%	115%	70%	130%
Chemical Oxygen Demand	6179532		16	14	NA	< 5	94%	90%	110%	96%	90%	110%	99%	70%	130%
Total Kjeldahl Nitrogen	6181106		<0.10	<0.10	NA	< 0.10	102%	70%	130%	102%	80%	120%	92%	70%	130%
Total Phosphorus	6198877		0.09	0.09	NA	< 0.02	94%	70%	130%	95%	80%	120%	91%	70%	130%
Dissolved Organic Carbon	6190793	6190793	1.3	1.4	NA	< 0.5	97%	90%	110%	93%	90%	110%	95%	80%	120%
Phenols	6189114		<0.001	<0.001	NA	< 0.001	101%	90%	110%	102%	90%	110%	104%	80%	120%
Dissolved Calcium	6188265		150	146	2.7%	< 0.05	101%	70%	130%	103%	80%	120%	102%	70%	130%
Dissolved Magnesium	6188265		27.5	25.7	6.8%	< 0.05	104%	70%	130%	111%	80%	120%	104%	70%	130%
Dissolved Potassium	6188265		12.3	11.9	3.3%	< 0.50	99%	70%	130%	103%	80%	120%	96%	70%	130%
Dissolved Sodium	6188265		242	238	1.7%	< 0.05	98%	70%	130%	105%	80%	120%	112%	70%	130%
Dissolved Arsenic	6188265		<0.003	<0.003	NA	< 0.003	101%	70%	130%	105%	80%	120%	109%	70%	130%
Dissolved Barium	6188265		0.508	0.516	1.6%	< 0.002	100%	70%	130%	98%	80%	120%	97%	70%	130%
Dissolved Boron	6188265		0.113	0.111	1.8%	< 0.010	97%	70%	130%	104%	80%	120%	96%	70%	130%
Dissolved Cadmium	6188265		<0.001	<0.001	NA	< 0.001	98%	70%	130%	100%	80%	120%	98%	70%	130%
Dissolved Chromium	6188265		<0.003	<0.003	NA	< 0.003	99%	70%	130%	105%	80%	120%	101%	70%	130%
Dissolved Copper	6188265		<0.003	<0.003	NA	< 0.003	101%	70%	130%	102%	80%	120%	101%	70%	130%
Dissolved Iron	6188265		23.8	23.3	2.1%	< 0.010	101%	70%	130%	100%	80%	120%	NA	70%	130%
Dissolved Lead	6188265		<0.001	<0.001	NA	< 0.001	95%	70%	130%	98%	80%	120%	94%	70%	130%
Dissolved Manganese	6188265		0.362	0.365	0.8%	< 0.002	101%	70%	130%	104%	80%	120%	102%	70%	130%
Dissolved Mercury	6190793	6190793	<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	100%	80%	120%	101%	70%	130%
Dissolved Zinc	6188265		<0.005	<0.005	NA	< 0.005	99%	70%	130%	104%	80%	120%	108%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate NA: results are under 5X the RDL and will not be calculated.

Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

TSS (Water)

Total Suspended Solids	6192280		<10	<10	NA	< 10	104%	80%	120%						
------------------------	---------	--	-----	-----	----	------	------	-----	------	--	--	--	--	--	--

Comments: NA signifies Not Applicable.

Duplicate NA: results are under 5X the RDL and will not be calculated.



Quality Assurance

CLIENT NAME: RESENV CONSULTING LIMITED

PROJECT: 13-004-00

SAMPLING SITE: Tri-R Landfill

AGAT WORK ORDER: 24T203830

ATTENTION TO: JASON BALSDON

SAMPLED BY: JTB

Water Analysis (Continued)

RPT Date: Oct 15, 2024			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Certified By:

Iris Veraestegui



Method Summary

CLIENT NAME: RESENV CONSULTING LIMITED

PROJECT: 13-004-00

SAMPLING SITE: Tri-R Landfill

AGAT WORK ORDER: 24T203830

ATTENTION TO: JASON BALSDON

SAMPLED BY: JTB

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Total Suspended Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540B,C,D	BALANCE
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C,D	BALANCE
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
Alkalinity (as CaCO ₃)	INOR-93-6000	Modified from SM 2320 B	PC TITRATE
Bicarbonate (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Carbonate (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH ₃ H	LACHAT FIA
Chemical Oxygen Demand	INOR-93-6042	modified from SM 5220 A and SM 5220 D	SPECTROPHOTOMETER
Total Kjeldahl Nitrogen	INOR-93-6048	modified from EPA 351.2 and SM 4500-NORG D	LACHAT FIA
Total Phosphorus	INOR-93-6057	modified from LACHAT 10-115-01-3A	LACHAT FIA
Dissolved Organic Carbon	INOR-93-6049	modified from SM 5310 B	SHIMADZU CARBON ANALYZER
Phenols	INOR-93-6072	modified from SM 5530 D	LACHAT FIA
Dissolved Calcium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP/MS
Dissolved Magnesium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Dissolved Potassium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP/MS
Dissolved Sodium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP/MS
Dissolved Arsenic	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Barium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Boron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cadmium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Chromium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Copper	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Iron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Lead	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Manganese	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Dissolved Zinc	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS

Have feedback?
Scan here for a quick survey!



5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
web@earth.agatlabs.com

Chain of Custody Record

It is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information

Company: Resenvu Consulting Limited
Contact: Dawn Beland
Address: 14336 County Road 21
Colborne ON / K0L5O
905-836-1119 Fax: _____
Phone: resenvu@gmail.com
Reports to be sent to:
1. Email: _____
2. Email: _____

Project Information

Project: 13-004-00
Site Location: Tr-R Landfill
Sampled By: JMB
AGAT Quote #: B113077030 PO: _____

Invoice Information

Company: _____
Contact: _____
Address: _____
Email: _____
Bill To Same: Yes ☒ No ☐

Regulatory Requirements:

☐ Regulation 153/04 ☐ Regulation 406
Table Indicate One
☐ Ind/Com ☐ Storm
☐ Res/Park ☐ Region
☐ Agriculture ☐ Prov. Water Quality Objectives (PWQO)
Soil Texture (Check One)
☐ Coarse ☐ Other
☐ Fine ☐ CCME

Report Guideline on Certificate of Analysis

Is this submission for a Record of Site Condition (RSC)?
☐ Yes ☒ No

Legal Sample

Sample Matrix Legend

GW Ground Water SD Sediment
O Oil SW Surface Water
P Paint R Rock/Shale
S Soil

Laboratory Use Only

Work Order #: 247203830
Cooler Quantity: 1
Arrival Temperatures: 9.5 9.8 9.9
Depot Temperatures: _____
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: Loose melted ice

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply): _____

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CSR

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC	Metals & Inorganics	Metals - CrVI, Hg, HWSB	BTEX, F1-F4 PHCs	PAHs	PCBs: Aroclors	Regulation 406 Characterization Package	PH, Metals, BTEX, F1-F4	EC, SAR	Regulation 406 SLP Rainwater Leach	MSLP: Metals VOCs SVOCs OC	Landfill Disposal Characterization TCLP	TCLP: Metals VOCs ABNs BAP PCBs	Corrosivity: Moisture Sulfide	Potentially Hazardous or High Concentration (Y/N)
1. <u>DW</u>	<u>Sp30</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														
2. <u>BH03-1</u>	<u>_____</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														
3. <u>BH07-1</u>	<u>_____</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														
4. <u>BH03-2</u>	<u>_____</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														
5. <u>BH07-2</u>	<u>_____</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														
6. <u>BH15-1</u>	<u>_____</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														
7. <u>_____</u>	<u>_____</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														
8. <u>_____</u>	<u>_____</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														
9. <u>_____</u>	<u>_____</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														
10. <u>_____</u>	<u>_____</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														
11. <u>_____</u>	<u>_____</u>	<u>AM PM</u>	<u>2</u>	<u>GW</u>		<u>Y</u>														

Samples Relinquished By (Print Name and Sign): Dawn Beland

Samples Relinquished By (Print Name and Sign): _____

Samples Relinquished By (Print Name and Sign): _____

Date: Sp30

Date: _____

Date: _____

Samples Received By (Print Name and Sign): T. Khan

Samples Received By (Print Name and Sign): _____

Samples Received By (Print Name and Sign): _____

Date: Oct 2

Date: _____

Date: _____

Time: 9:30 AM

Time: _____

Time: _____

Page: 1 of 1

Page: 1 of 1

Page: 1 of 1

No: T-150122

Date Issued: Jul 16, 2004

Page 8 of 8



CLIENT NAME: RESENV CONSULTING LIMITED
BOX 490, 14336 COUNTY ROAD 21
COLBORNE, ON K0K1S0
(905) 836-1119

ATTENTION TO: JASON BALSDON

PROJECT:

AGAT WORK ORDER: 24T203831

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Inorganic Team Lead

DATE REPORTED: Oct 13, 2024

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

***Notes**

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information is available on request from AGAT Laboratories, in accordance with ISO/IEC 17025:2017, ISO/IEC 17025:2005 (Quebec), DR-12-PALA and/or NELAP Standards.
- This document is signed by an authorized signatory who meets the requirements of the MELCCFP, CALA, CCN and NELAP.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T203831

PROJECT:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: RESENV CONSULTING LIMITED
SAMPLING SITE: Codrington Pit

ATTENTION TO: JASON BALSDON
SAMPLED BY:

BOD5									
DATE RECEIVED: 2024-10-02				DATE REPORTED: 2024-10-13					
SAMPLE DESCRIPTION:									
SAMPLE TYPE:									
DATE SAMPLED:									
G / S									
Parameter	Unit	G / S	RDL	S7	S2	S4	RDL	SW2	SW1
Biochemical Oxygen Demand, Total	mg/L	2	<2	Water	Water	Water	RDL	Water	Water
				2024-09-30	2024-09-30	2024-09-30		2024-09-30	2024-09-30
				6189193	6189203	6189204		6189205	6189206
				<2	<2	<6	6	<2	4

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
6189204 RDL for BOD is raised due to insufficient DO depletion at selected dilution levels.
Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Yris Varastegui



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T203831

PROJECT:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: RESENV CONSULTING LIMITED

SAMPLING SITE: Codrington Pit

ATTENTION TO: JASON BALSDON

SAMPLED BY:

Surface Water Comprehensive Chemistry										DATE REPORTED: 2024-10-13
DATE RECEIVED: 2024-10-02										
Parameter	Unit	SAMPLE DESCRIPTION:		SAMPLE TYPE:		DATE SAMPLED:		DATE REPORTED:		DATE REPORTED: 2024-10-13
		G / S	RDL	S7	Water	2024-09-30	6189193	S2	Water	
				66	122	70	77	SW1	Water	
Electrical Conductivity	µS/cm	2	NA	6.79	6.99	7.10	7.10	6189203	6189204	6189206
pH	pH Units			6.79	6.99	7.10	7.10	6.50	6.44	
Total Dissolved Solids	mg/L	10	38	64	64	26	34	34	34	
Total Suspended Solids	mg/L	10	<10	<10	<10	<10	<10	<10	<10	
Alkalinity (as CaCO ₃)	mg/L	5	17	34	34	10	10	10	10	
Bicarbonate (as CaCO ₃)	mg/L	5	17	34	34	10	10	10	10	
Carbonate (as CaCO ₃)	mg/L	5	<5	<5	<5	<5	<5	<5	<5	
Chloride	mg/L	0.10	6.02	10.7	11.3	9.40	10.7	10.7	10.7	
Nitrate as N	mg/L	0.05	0.19	0.24	0.23	<0.05	<0.05	<0.05	<0.05	
Nitrite as N	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Sulphate	mg/L	0.10	3.02	6.75	7.94	4.36	4.84	4.36	4.84	
Ammonia as N	mg/L	0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Chemical Oxygen Demand	mg/L	5	21	25	27	27	26	26	26	
Dissolved Organic Carbon	mg/L	0.5	5.9	7.3	7.0	6.1	5.7	5.7	5.7	
Phenols	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Total Kjeldahl Nitrogen	mg/L	0.10	<0.10	<0.10	0.98	<0.10	<0.10	<0.10	<0.10	
Total Phosphorus	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Total Calcium	mg/L	0.20	6.43	12.1	11.8	4.52	4.51	4.51	4.51	
Total Magnesium	mg/L	0.10	1.91	3.23	3.04	1.41	1.24	1.24	1.24	
Total Potassium	mg/L	0.50	1.35	2.64	2.62	0.88	0.93	0.93	0.93	
Total Sodium	mg/L	0.10	3.53	8.42	8.36	6.17	6.35	6.35	6.35	
Total Arsenic	mg/L	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Total Barium	mg/L	0.002	0.020	0.025	0.022	0.015	0.014	0.014	0.014	
Total Boron	mg/L	0.010	<0.010	0.064	0.065	<0.010	<0.010	<0.010	<0.010	
Total Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Chromium	mg/L	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Total Copper	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Total Iron	mg/L	0.050	0.688	0.735	0.372	0.624	0.472	0.472	0.472	
Total Lead	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Total Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	

Yris Varastegui

Certified By:



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T203831

PROJECT:

CLIENT NAME: RESENV CONSULTING LIMITED

SAMPLING SITE: Codrington Pit

ATTENTION TO: JASON BALSDON

SAMPLED BY:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

Surface Water Comprehensive Chemistry									
DATE RECEIVED: 2024-10-02				DATE REPORTED: 2024-10-13					
SAMPLE DESCRIPTION:									
SAMPLE TYPE:									
DATE SAMPLED:									
G / S									
RDL									
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Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Yris Varastegui



Quality Assurance

CLIENT NAME: RESENV CONSULTING LIMITED

PROJECT:

SAMPLING SITE: Codrington Plt

AGAT WORK ORDER: 24T203831

ATTENTION TO: JASON BALSDON

SAMPLED BY:

Water Analysis

RPT Date: Oct 13, 2024			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE		MATRIX SPIKE	
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper

Surface Water Comprehensive Chemistry

Electrical Conductivity	6188265		2570	2530	1.6%	< 2	104%	90%	110%						
pH	6188265		6.99	7.00	0.1%	NA	99%	90%	110%						
Total Dissolved Solids	6189116		350	358	2.3%	< 10	100%	80%	120%						
Total Suspended Solids	6189174		<10	<10	NA	< 10	100%	80%	120%						
Alkalinity (as CaCO3)	6188265		581	587	1.0%	< 5	98%	80%	120%						
Bicarbonate (as CaCO3)	6188265		581	587	1.0%	< 5	NA								
Carbonate (as CaCO3)	6188265		<5	<5	NA	< 5	NA								
Chloride	6189176		95.8	95.7	0.1%	< 0.10	94%	70%	130%	101%	80%	120%	102%	70%	130%
Nitrate as N	6189176		<0.05	<0.05	NA	< 0.05	99%	70%	130%	99%	80%	120%	98%	70%	130%
Nitrite as N	6189176		<0.05	<0.05	NA	< 0.05	97%	70%	130%	95%	80%	120%	92%	70%	130%
Sulphate	6189176		28.9	29.0	0.3%	< 0.10	97%	70%	130%	99%	80%	120%	97%	70%	130%
Ammonia as N	6190810		109	116	6.2%	< 0.02	108%	70%	130%	107%	80%	120%	NA	70%	130%
Chemical Oxygen Demand	6179532		16	14	NA	< 5	94%	80%	120%	96%	90%	110%	99%	70%	130%
Dissolved Organic Carbon	6192305		3.1	3.1	0.0%	< 0.5	97%	90%	110%	93%	90%	110%	95%	80%	120%
Phenols	6189114		<0.001	<0.001	NA	< 0.001	101%	90%	110%	102%	90%	110%	104%	80%	120%
Total Kjeldahl Nitrogen	6181106		<0.10	<0.10	NA	< 0.10	102%	70%	130%	102%	80%	120%	92%	70%	130%
Total Phosphorus	6197777		0.46	0.46	0.0%	< 0.02	100%	70%	130%	102%	80%	120%	NA	70%	130%
Total Calcium	6182053		116	115	0.9%	< 0.20	98%	70%	130%	97%	80%	120%	97%	70%	130%
Total Magnesium	6182053		13.1	13.0	0.8%	< 0.10	104%	70%	130%	104%	80%	120%	105%	70%	130%
Total Potassium	6182053		1.07	1.06	NA	< 0.50	101%	70%	130%	99%	80%	120%	101%	70%	130%
Total Sodium	6182053		20.6	20.7	0.5%	< 0.10	96%	70%	130%	100%	80%	120%	97%	70%	130%
Total Arsenic	6182053		<0.003	<0.003	NA	< 0.003	101%	70%	130%	103%	80%	120%	102%	70%	130%
Total Barium	6182053		0.040	0.040	0.0%	< 0.002	97%	70%	130%	102%	80%	120%	99%	70%	130%
Total Boron	6182053		<0.010	<0.010	NA	< 0.010	98%	70%	130%	101%	80%	120%	102%	70%	130%
Total Cadmium	6182053		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	102%	80%	120%	103%	70%	130%
Total Chromium	6182053		<0.003	<0.003	NA	< 0.003	102%	70%	130%	104%	80%	120%	105%	70%	130%
Total Copper	6182053		<0.002	<0.002	NA	< 0.002	101%	70%	130%	104%	80%	120%	103%	70%	130%
Total Iron	6182053		<0.050	<0.050	NA	< 0.050	104%	70%	130%	104%	80%	120%	106%	70%	130%
Total Lead	6182053		<0.0005	<0.0005	NA	< 0.0005	95%	70%	130%	96%	80%	120%	94%	70%	130%
Total Mercury	6189193 6189193		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	100%	80%	120%	93%	70%	130%
Total Zinc	6182053		0.031	0.028	NA	< 0.020	98%	70%	130%	102%	80%	120%	103%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate NA: results are under 5X the RDL and will not be calculated.

Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

BOD5

Biochemical Oxygen Demand, Total 6190900 6190900 711 711 0.0% < 2 83% 70% 130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.



Quality Assurance

CLIENT NAME: RESENV CONSULTING LIMITED

AGAT WORK ORDER: 24T203831

PROJECT:

ATTENTION TO: JASON BALSDON

SAMPLING SITE: Codrington Plt

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Oct 13, 2024			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE		MATRIX SPIKE	
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper

Certified By:

Iris Veraátegui



Method Summary

CLIENT NAME: RESENV CONSULTING LIMITED

PROJECT:

SAMPLING SITE: Codrington Plt

AGAT WORK ORDER: 24T203831

ATTENTION TO: JASON BALSDON

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Biochemical Oxygen Demand, Total	INOR-121-6023	SM 5210 B	INCUBATOR
Electrical Conductivity	INOR-93-6000	modified from SM 2510 B	PC TITRATE
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C, D	BALANCE
Total Suspended Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540B, C, D	BALANCE
Alkalinity (as CaCO ₃)	INOR-93-6000	Modified from SM 2320 B	PC TITRATE
Bicarbonate (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Carbonate (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH ₃ H	LACHAT FIA
Chemical Oxygen Demand	INOR-93-6042	modified from SM 5220 A and SM 5220 D	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-93-6049	modified from SM 5310 B	SHIMADZU CARBON ANALYZER
Phenols	INOR-93-6072	modified from SM 5530 D	LACHAT FIA
Total Kjeldahl Nitrogen	INOR-93-6048	modified from EPA 351.2 and SM 4500-NORG D	LACHAT FIA
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
Total Calcium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Magnesium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Potassium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Sodium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Barium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Boron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Iron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Lab Filtration DOC	SR-78-9001		FILTRATION



Have feedback?
Scan here for a
quick survey!

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
web@earth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:
 Company: ResENV Consulting Ltd.
 Contact: Person Balsdon
 Address: 14336 County Road 21
Collingwood ON K9K 1S0
 Phone: 905-836-1119
 Reports to be sent to:
 1. Email: resenvu@gmail.com
 2. Email:

Project Information:
 Project:
 Site Location:
 Sampled By:
 AGAT Quote #:
 PO: _____

Invoice Information:
 Company:
 Contact:
 Address:
 Email:
 Bill To Same: Yes ☐ No ☐

Regulatory Requirements:
 (Please check all applicable boxes)
☐ Regulation 153/04
☐ Regulation 406
 Table - Indicate One
☐ Ind/Com
☐ Res/Park
☐ Agriculture
☐ Regulation 558
☐ CCME
☐ Sewer Use
☐ Sanitary
☐ Storm
 Region:
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
 Indicate One
☐ Coarse
☐ Fine
 Soil Texture (Check One)
☐ Coarse
☐ Fine

Report Guideline on Certificate of Analysis
 Is this submission for a Record of Site Condition (RSC)?
☐ Yes ☒ No

Legal Sample ☐
Sample Matrix Legend
 GW Ground Water SD Sediment
 O Oil SW Surface Water
 P Paint R Rock/Shale
 S Soil

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/Special Instructions	N / Y
1. <u>S7</u>	<u>Sept 30</u>	<u>AM</u>	<u>10</u>	<u>SW</u>		
2. <u>S7</u>		<u>PM</u>	<u>10</u>	<u>SW</u>		
3. <u>S4</u>		<u>AM</u>	<u>10</u>	<u>SW</u>		
4. <u>SW2</u>		<u>PM</u>	<u>10</u>	<u>SW</u>		
5. <u>SW1</u>		<u>AM</u>	<u>10</u>	<u>SW</u>		
6.		<u>PM</u>				
7.		<u>AM</u>				
8.		<u>PM</u>				
9.		<u>AM</u>				
10.		<u>PM</u>				
11.		<u>AM</u>				

Signature and Stamp:
 Samples Received By (Print Name and Sign): Amy Tilley
 Samples Received By (Print Name and Sign):
 Samples Received By (Print Name and Sign):
 Samples Received By (Print Name and Sign):

Laboratory Use Only

Work Order #: 247203831
 Cooler Quantity: 2
 Arrival Temperatures: 8.5 8.9 9.3
 Depart Temperatures: 9.8 9.2 9.9
 Custody Seal Intact: ☐ Yes ☒ No
 Notes: 100% (multid.)

Turnaround Time (TAT) Required:
Regular TAT ☒ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day
 OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
 *TAT is exclusive of weekends and statutory holidays
 For 'Same Day' analysis, please contact your AGAT CSR

Regulation 406 Characterization Package	Regulation 406 SPLP Rainwater Leach	mSPR: Metals ☐ VOCs ☐ SVOCs ☐ PCBs	Landfill Disposal Characterization TCLP: TCLP: ☐ Metals ☐ VOCs ☐ ABNs ☐ BAP ☐ PCBs	Corrosivity: ☐ Moisture ☐ Sulphide	Potentially Hazardous or High Concentration (Y/N)
EC, SAR					
PH, Metals, BTEX, F1-F4					
PCBs: Aroclors ☐					
PAHs					
BTEX, F1-F4 PHCs					
Metals & Inorganics					
Metals: ☐ Cu, ☐ Hg, ☐ HWSB					
VOC					
Surf					

Date and Time:
 Date: Oct 2 Time: 9:30 AM
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