2024 Annual Report

Black Donald Waste Disposal Site ECA No. A411902

March 27, 2025

Jp2g Project # 22-6213D



Table of Contents

DIS	TRIBU	TION LI	STi	ii
EXE		/E SUM	MARYii	ii
1	INTR	ODUCT	ION	1
	1.1	Site Loo	cation	1
	1.2	Site Ow	nership and Key Personnel	1
	1.3	Descrip	tion and Development of the Waste Disposal Site	2
	1.4	Ministr	y Consultation	3
	1.5	Purpos	e and Scope	5
2	SITE	DESCRI	PTION	5
	2.1	Topogr	aphy and Drainage	5
	2.2	Hydrog	eological Conditions	5
	2.3	Land U	se	6
	2.4	Operat	ional Setting	6
3	FNVI	RONM	NTAL MONITORING PROGRAM	7
	3.1	Monito	ring Locations	7
	0.1	3.1.1	Groundwater Monitoring Locations	7
		3.1.2	Surface Water Monitoring Locations	, 8
	3.2	Monito	ring Procedures and Methods.	8
	3.3	Monito	ring Program 2024	8
	3.4	Analyti	cal Laboratory Accreditation	8
	3.5	Landfill	Gas Monitoring	9
	3.6	Operat	ional Monitoring	9
л	ENI//			۵
4		Historia		ס ר
	4.1 1 0	Ground	al Dala	9
	4.Z	Ground	water Plow Molilitoring	9
	4.5		Croundwater Assessment Criteria	9
		4.3.1	Groundwater Assessment Criteria	9
		4.3.2	Groundwater Quality 2024	U 1
		4.5.5	Reasonable Use Concept Assessment	ך ד
	A A	4.3.4	Reasonable Use Conclusions 2024	2 ว
	4.4		Surface Water Accessment Criteria	2 ว
		4.4.1	Surface Water Assessment Criteria	2 ว
	4 5	4.4.Z	Surface Water Monitoring 2024	2 ว
	4.5			5 ว
		4.5.1	Un-Ionized Ammonia	3 ∧
		4.5.Z	DdTIUTT	н л
		4.5.3	DUI UII	н л
		4.5.4	Chromium	4
		4.5.5	Chamical Owygan Domand (COD)	4 F
		4.5.0	Iron	5 E
		4.5./	II UII	с С
		4.5.8	Nitrate	C



		4.5.9	Sodium	.15
		4.5.10	Sulphate	.16
		4.5.11	Total Kjeldahl Nitrogen	.16
		4.5.12	Total Phosphorus	.16
		4.5.13	Trigger Mechanism Review Summary	.16
	4.6	Operati	ions Summary	.16
		4.6.1	Site Operations	.16
		4.6.2	Waste Disposal Summary	.17
		4.6.3	Monitoring and Screening Checklist	.17
5	CON		NS AND RECOMMENDATIONS	.17
	5.1	Ground	lwater Monitoring	.18
	5.2	Surface	Water Monitoring	.18
REF	EREN	CES		.19
LIM	ITATI	ONS AN	ID USE OF THE REPORT	.20

Tables

Monitoring Locations
Monitoring Program 2024
Median Background Concentrations 2024
Reasonable Use Determination 2024
Reasonable Use Conclusions 2024
Surface Water Triggers Assessment 2024
Proposed Monitoring Program 2025

Figures

Figure 1	Regional Location Map
Figure 2	Existing Condition Plan
Figure 3	Site Plan and Monitoring Locations
Figure 4a	Ground Water Flow – Spring 2024
Figure 4b	Ground Water Flow – Fall 2024

Appendices

, appendices	
Appendix A	Environmental Compliance Approval
Appendix B	MECP Correspondence
Appendix C	Borehole Logs
Appendix D	Photographs Album
Appendix E	Sampling Protocol
Appendix F	Historic Static levels, Ground and Surface water results
Appendix G	Groundwater Elevations 2024
Appendix H	Laboratory Certificates of Analysis 2024
Appendix I	Chemistry Analysis 2024
Appendix J	Monitoring and Screening Checklist 2024



DISTRIBUTION LIST

PDF	Association / Company
1	Township of Greater Madawaska
1	Ministry of the Environment, Conservation and Parks (Ottawa District Office)
1	Jp2g Consultants Inc.

Jp2g Consultants Inc. Signatures

Abdul Alhaj

Report Prepared By:

Abdul Kader Alhaj, EIT Environmental Technologist | Environmental Services

Report Reviewed By:

Kevin Mooder, MCIP RPP Manager | Environment Services

Maraw Be

Report Reviewed and Approved By:

Andrew Buzza, P.Geo Senior Hydrogeologist





EXECUTIVE SUMMARY

Jp2g Consultants Inc. (Jp2g) was retained by the Township of Greater Madawaska to conduct the 2024 ground and surface water monitoring at the Black Donald Waste Disposal Site (WDS or landfill), located on part of Lot 9, Concession 2 and 3 within the geographic Township pf Brougham, in the amalgamated Township of Greater Madawaska, in the County of Renfrew. This annual report summarizes the results of the groundwater and surface water sampling that was completed at the site in April, August, and November 2024, and the results are compared to historical results dating from 2016 to 2023.

The groundwater flow direction at the site was similar to historical interpretations with predominant groundwater flow direction to the southeast of the site.

Groundwater immediately downgradient from the site at monitoring wells BH1 and BH4 are interpreted to be impacted from landfill-related activities in 2024. At monitoring wells BH1 and BH4, all parameters met the ODWQS except for field pH, alkalinity, hardness, TDS (spring only), DOC, manganese, aluminum, sulphate (fall only), and iron. Results from monitoring well BH1 were interpreted to be most representative of leachate quality at the Black Donald site at this time. As per the ECA, volatile organic compounds VOC samples to be collected from BH1 every five (5) years. VOC samples were last collected from BH1 in 2023, and all values were below ODWS limits. The next sampling event for VOC analysis at monitoring well BH1 is scheduled for 2028.

In 2024, all parameters met the Reasonable Use Criteria (RUC) at MW08-7S except for DOC, therefore the Black Donald site was interpreted to meet the intent of Ministry Guideline B-7 at the downgradient eastern CAZ boundary in 2024. All parameters met the Reasonable Use Criteria (RUC) at MW23-7D in 2024 except for TDS (spring only), alkalinity (spring only), manganese (fall only), and DOC. Given the considerations to naturally occurring concentrations of alkalinity, DOC, manganese, and TDS in the background (BH2), the Black Donald site was interpreted to meet the intent of Ministry Guideline B-7 and was interpreted to be in compliance with RUC at the southeastern CAZ boundary.

Based on the surface water quality results in 2024, and the significant distance of each sampling location from the Approved Landfilling Area of the Black Donald site, the surface water system northeast and southeast of the Black Donald site were not interpreted to be impacted from landfill-related activities.

Based on a review of five (5) year time trend analysis for parameters un-ionized ammonia, barium, boron, chloride, chromium, COD, iron, nitrate, sodium, sulphate, TKN and total phosphorus, the Trigger Mechanism was not interpreted to be activated in 2024.

Based on a capacity survey completed December 20, 2023, the remaining lifespan of the site based on a total remaining capacity of approximately 2718m³ and annual landfilling rate of 857m is approximately 3 years as of December 2023, based on an average (mean) five (5) year fill rate (2018 to 2023) of 857 cubic metres. The site did not receive any C&D and bulky waste in 2023 and 2024 as it was directed to the Mount St. Patrick site for disposal. All other municipal waste generated within the Township was directed to the Township's transfer stations at the Griffith, Norway Lake, and Mount St. Patrick Sites for storage and haulage to its end use.

An application to expand the Black Donald Waste Disposal Site will be filed with the Ministry in 2025.



2025 Monitoring Recommendations

In support of the application to expand the landfilling area in 2025 and consultation with MECP TSS staff, Jp2g has recommend and changes to the monitoring program in 2025. Ground and surface water should continue to be sampled bi-annually (May/June and October/November) for the same list of parameters as analyzed in 2024.



1 INTRODUCTION

This report was prepared by Jp2g Consultants Inc. (Jp2g) for the purposes of presenting and interpreting the results of the 2024 ground and surface water monitoring program completed at Black Donald Waste Disposal Site (WDS). The site is located centrally in the Township of Greater Madawaska, and according to the Township's long- term waste management plan, the Black Donald WDS was identified for the landfilling of waste received from the Griffith, Norway Lake, and Mount St. Patrick transfer stations. The site was closed to the public on April 5, 2010, with disposal operations available for municipal vehicles and Township-approved haulers only for construction and demolition (C&D) and bulky waste, with other municipal waste generated within the Township directed to the Township's existing transfer stations for transfer and disposal to GFL Environmental Inc.

Jp2g Consultants Inc. completed the environmental monitoring program in 2024, previously Greenview Environmental provided this service until 2022. For consistency in reporting, details previously provided by Greenview (2023) have been repeated in part or in whole in this report.

1.1 Site Location

A detailed description of the site location is as follows:

- The site is located on part of Lot 9, Concession 2 and 3 within the geographic Township of Brougham, in the Township of Greater Madawaska as shown on **Figure 1**.
- The civic address of the site is 34 Hydro Dam Road.
- The site coordinates are:
 - 45°14'00" N 76°52'13"W
 - NAD 1983 UTM Zone 18 353188E 5010581N
- Access to the site is provided by Hydro Dam Road, located off County Road 508, approximately fifteen (15) kilometers (km) southwest of the Village of Calabogie.
- The site is situated on Township-owned lands and consists of a 1.2-hectare (ha) waste disposal site within a total licensed property area of 21.36 ha, inclusive of lands used for operational buffer and contaminant attenuation zone (CAZ) purposes.
- The site is operated as a solid waste landfill for the Township of Greater Madawaska (Township) under Environmental Compliance Approval (ECA) A411902 as most recently amended on January 24, 2013. A copy of the ECA is included in Appendix A.

1.2 Site Ownership and Key Personnel

Site operations are directed by the Township of Greater Madawaska. Contacts for the municipality and the Competent Environmental Practitioner (CEP) for both groundwater and surface water as defined by the Ministry (2010) are as follows:

Municipal Contact

Township of Greater Madawaska Leonard Emon Facilities Manager Phone: 613.752.2249 Email: <u>lemon@greatermadawaska.com</u> <u>CEP Contact</u> Jp2g Consultants Inc. Andrew Buzza, P.Geo Sr. Hydrogeologist Email: <u>andrew.buzza@jp2g.com</u>



1.3 Description and Development of the Waste Disposal Site

The following section provides a general description of the site, including operational details:

Environmental Compliance Approval:

The site operates under ECA No. A411902 dated March 27, 1980 as amended October 22, 2001, July 12, 2002 and January 24, 2013 (**Appendix A**).

Site Status:

The site is currently operational, with disposal operations available for municipal vehicles and Township-approved haulers only for construction and demolition (C&D) and bulky wastes.

Site Capacity:

Under Condition 18 of the current ECA, the approved total waste disposal volume is 46,785m³.

Projected Site Life:

The site did not receive waste in 2023 and 2024. Based on a capacity survey completed December 20, 2023 the remaining lifespan of the site based on a total remaining capacity of approximately 2718m³ and annual landfilling rate of 857m is approximately 3 years as of December 2023. A more accurate remaining capacity will be determined when landfilling operations commence and a survey is completed when the ground waste is compacted.

Area of current waste cell footprint and approved footprint:

The current ECA recognizes a 1.2 ha landfilling area within a total site area of 21.36ha.

Dates when the site opened, operated and closed as applicable:

The site was opened in the 1960's and ceased receiving municipal solid waste and was closed to the public on April 5, 2010. Under the current ECA the site receives construction and demolition (C&D) and bulky wastes.

Information on final cover, slopes and engineering controls:

Details are found in the Site Design, Operations and Development Plan dated December 22, 2010 (Greenview 2010). Final cover was applied to portions of the landfill site and the side slopes.

Any Permits To Take Water associated with the site: There are no permits to take water associated with the site.

Other authorizing and/or control instruments associated with the site: There are no storm water management facilities associated with the site.

Description of any leachate collection systems; and any sewage works, including the C of A number of the works: The Black Donald Waste Disposal Site is designed for the natural attenuation of leachate. There are no collection systems or sewage works at the site.

Any site developments which occurred during the year of the monitoring report:

None

Any new developments in the vicinity of the site of relevance from a monitoring perspective: None.



Historical Site Overview

Environmental Baseline Investigations which were undertaken:

Investigations of the Black Donald Waste Disposal Site have been carried out since 1999. Reports have been submitted annually to the Ministry.

Design and Construction of the Site:

The site design, development and operational requirements for the current waste disposal site are outlined in Greenview (2010) listed as item 7 in Schedule A of the ECA.

Development of environmental monitoring systems:

Environmental monitoring is conducted annually in accordance with Condition 26 and Schedule "B" of the ECA and recent TSS review comments on the expansion feasibility study.

Conceptual site model:

Infiltrating groundwater at the site will migrate vertically through more porous overburden material until intersected by the shallow groundwater table over bedrock. Groundwater flow is governed by local topography predominantly to be downhill to the southeast and southwest.

Initial placement of waste materials: Within the 1.2 landfilling area.

Filling, closure and placement of final cover over waste cells:

The processed C&D and bulky waste is ground on site and is applied to the waste mound as cover as required.

Problems associated with of final cover over waste:

There have been no documented issues with operation of the waste disposal site. On occasion there has been Fill Beyond Approved Limits (FBAL) which has been addressed with the site operator.

Date of site closure, actual or projected, including any closure plans: There are no closure plans. The Township plans to expand the capacity.

1.4 Ministry Consultation

Further to the Ontario Ministry of the Environment, Conservation, and Parks (MECP and or the Ministry) Technical Support Section (TSS) groundwater review comments (March 17, 2008) three (3) additional monitoring wells were installed at the Black Donald WDS in June 2008 to more adequately interpret groundwater quality southeast, southwest and west of the site, and to establish the site's conformance with the Reasonable Use Concept (RUC) and Guideline B-7 near the site and CAZ boundaries. One of the new monitoring wells (MW08-6) was installed west of the site on Crown Land, with authorization from the Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry (Greenview, 2023).

On November 16, 2010, the Township responded to the Ministry regarding the Township's intent to submit an application to amend the ECA and supporting technical documentation in the form of a *Design, Operations and Development Plan* for the Black Donald WDS by December 31, 2010 (Greenview, 2023). On December 22, 2010, the Township submitted the Report (Greenview, 2023) to the Environmental Assessment and Approvals Branch (EAAB) and the Ottawa District Office, and confirmation of receipt was received by the Township from the Ministry on January 17, 2011. The Township received surface and groundwater review comments dated April 30, 2012 and May 30, 2012, respectively. The Ministry TSS accepted the surface water and groundwater Trigger Mechanisms presented (Greenview, 2023).



In addition, the Township received a request for additional information with respect to the application from the Ministry's Operations Division, in correspondence dated May 2012. The Township provided a response to the Ministry to address TSS surface water and groundwater review comments and the request for additional information. The application to amend the ECA for the Black Donald was approved by the Ministry through the ECA, issued January 24, 2013 (Greenview, 2023).

The Black Donald WDS was inspected by the Ministry Ottawa District Office on May 26, 2015, and a related Inspection Report was provided to the Township dated July 6, 2015. Action items were required by the Inspection Report, and the Township provided a Compliance Action Plan to the Ministry dated October 1, 2015. The Township committed to completion of the compliance items in accordance with the dates identified in the Compliance Action Plan. All actions were understood to have been completed by November 15, 2015 (Greenview, 2023).

As part of the 2015 Annual Report, the Township requested that the Ministry consider removing the requirement for surface water sampling as part of the environmental monitoring program for the Black Donald WDS, given that historical surface water quality data was not interpreted to be impacted by landfill-related activities. The Ministry at this time recommended that surface water monitoring continue consistent with historical practices. A subsequent letter from the Ministry Ottawa District Office dated July 7, 2016, reiterated that surface water monitoring should continue as part of the annual environmental monitoring program for the Black Donald site (Greenview, 2023).

On October 16, 2019, the Township received an Inspection Report from the Ministry's Ottawa District Office regarding the Black Donald site. The Inspection Report included action items to be addressed by the Township and accordingly an Action Plan was prepared (Greenview dated November 25, 2019) and submitted to the Ministry Ottawa District Office on November 26, 2019. Confirmation of completion of the action items was received from the Ministry dated February 6, 2020. As part of the response, the Township was required to submit photographs to the Ministry in accordance with their request. The Township submitted their response to the Ministry Ottawa District Office on February 14, 2020, which was approved by the Ministry in an electronic communication dated February 18, 2020 (Greenview, 2023).

An Inspection Report dated November 21, 2022 was received by the Township from the Ministry Ottawa District Office. The only issue of concern was that the site may not have the remaining capacity as stated in the 2021 Annual Report prepared by Greenview (2022), the Inspection Report was not acknowledged by Greenview (2023). A copy of the Inspection Report is included in **Appendix B**.

The Township retained Jp2g to determine the feasibility of expanding the capacity of the Black Donald WDS. An Expansion Feasibility Study dated October 25, 2022, was filed with the Ministry's Ottawa District Office. Ministry Technical Support Section comments (Groundwater January 6, 2023, and Surface Water January 11, 2023) were addressed by Jp2g in a letter dated January 23, 2023. Jp2g filed a follow up letter dated December 29, 2023, describing the activities completed to support the expansion including additional monitoring well installation, enhanced monitoring program and assessment of surface water control requirements. A revised Expansion Feasibility Study dated October 10, 2024, was submitted by Jp2g to the Ministry's Ottawa District Office. Copies of this documentation are included in **Appendix B**.



1.5 Purpose and Scope

The purpose of this report is to provide an overview of the annual monitoring, environmental compliance, and operations at the Black Donald WDS, in accordance with Condition 27 of the ECA (A411902), including the following:

- Groundwater quality assessment and RUC (Guideline B-7) compliance
- Surface water quality assessment
- Trigger Mechanism review
- Site operational overview and capacity assessment.
- Preparation of an annual report that summarises the results of the monitoring program and submitting the report to the Ministry.

2 SITE DESCRIPTION

The following sections present a summary of the physical characteristics for the Black Donald WDS and is based in part on the descriptions in the Annual Monitoring Reports 2008-2022 prepared by Greenview (2009-2023). The Black Donald site is bordered on the south and east by forested lands, and by a utility corridor to the west as shown in **Figure 2**.

2.1 Topography and Drainage

The site is located on a topographic bedrock high with slopes extending from the waste pile to the southeast and east towards Hydro Dam Road. Topography south and west of the site slopes to the south and then east towards Hydro Dam Road as shown in **Figure 2**.

Surface water drainage patterns at the site were altered in 2001 with the construction of drainage ditches along the northeastern boundary of the site adjacent to Hydro Dam Road and at the southwest corner of the site. The drainage ditches were constructed in the fall of 2001 to avoid on-site surface water ponding and to promote runoff. Historically, surface water at and adjacent to the site was monitored three (3) times annually, in the spring, summer, and fall, at seven (7) established surface water monitoring locations. Following receipt of TSS surface water review comments in October 2009, three (3) surface water locations were removed from the environmental monitoring program (Greenview, 2023). In 2023 two (2) surface water monitoring locations were removed from the environmental monitoring program as requested by Jp2g October 25, 2022, and approved by the Ministry (January 11, 2023). As part of the expansion design, new surface water monitoring locations representative of run-off from the landfill site may be established. Relevant correspondence is provided in **Appendix B**.

2.2 Hydrogeological Conditions

The Black Donald site is located on terrain consistent with rugged aspects of the Canadian Shield. Groundwater flow is governed largely by local topography and the presence of a dense bedrock unit beneath a more permeable overburden unit (Gartner Lee, 1999). The predominant pathways of groundwater flow were interpreted to be downhill to the southeast and southwest.



Overburden geology at the Site is characterized by a thin veneer of sandy overburden materials, approximately 0.3 to 1.5 metres (m) in thickness, overlying a fractured marble bedrock unit (Golder, 2007). Bedrock outcrops, knolls, and knob hills are prevalent in the vicinity of the Black Donald site, which confirms the shallow nature of overburden, and the proximity of the bedrock contact to surface near the site (Gartner Lee, 1999).

A site reconnaissance was conducted further to the Ministry's TSS groundwater review comments dated December 18, 2006. Following approval from the MNRF to install a monitoring well on Crown Land to the northwest of the site, monitoring well (MW08-6) was installed on June 5, 2008, to assist in establishing the site's conformance with Guideline B-7 at the western CAZ boundary. Monitoring wells MW08-5 and MW08-7 were installed on June 5, 2008, to the southwest and southeast of the site to assess conformance with the Ministry Guideline B-7 at the respective CAZ boundaries. MW08-7 was extended 7.5m into a sand and gravel deposit. All other monitoring wells were installed through a thin sand overburden layer into bedrock.

Historical groundwater elevations recorded at the site indicate that a shallow groundwater divide is present in the vicinity of the waste mound and that predominant directions of groundwater flow are to the southeast and southwest (Golder, 2007; SGS Lakefield Research Ltd. [SGS], 2005). In 2008, an eastward trending groundwater flow direction was interpreted in the vicinity of MW08-6. Based on the upgradient location of MW08-6 relative to the waste mound, groundwater quality at MW08-6 was interpreted to be characteristic of background groundwater quality at the site. A north-south oriented groundwater basin was also interpreted to exist in the vicinity of BH4 and MW08-5, based on groundwater elevations and contours measured and calculated from field measurements.

2.3 Land Use

The Black Donald WDS is designated as Active Waste Disposal Site on Schedule "A", of the County's Official Plan. Adjacent land use is designated as Rural, Mineral Aggregate and Crown Land. On Schedule "B" of the Township of Greater Madawaska Zoning By-Law the site is zoned as Waste Disposal (WD) and Extractive Industrial (EM). A utility corridor with an overhead electricity transmission line exists west of the site, in a northeasterlysouthwesterly orientation.

There are no residential drinking water or commercial wells near the Black Donald WDS. The closest residential well is located approximately 700 m northwest and upgradient of the site, on Black Donald Road.

2.4 Operational Setting

The Black Donald WDS currently consists of a 1.2 ha waste disposal site within a total licensed property area of 21.36 ha, inclusive of land used for operational buffers and CAZ purposes as shown on **Figure 3**. The Black Donald WDS was closed to the public for waste and recycling operations on April 5, 2010, as detailed in correspondence to the Ministry dated March 9, 2010, regarding a waste management plan update from the Township.

The Black Donald WDS is approved to accept waste from the entire Township and currently operates as an active waste disposal site receiving municipal C&D and bulky wastes for processing and disposal. As part of the waste management plan for the site, disposal operations at the site are currently available for municipal vehicles and Township-approved haulers only, under the supervision of Township operations staff. Bentonite clay material was emplaced at the site and used for regular and/or final cover in 2021. In 2023 and 2024 no waste was accepted at the site, only C&D and bulky waste stockpiled from 2022 was ground and landfilled in 2023.



3 ENVIRONMENTAL MONITORING PROGRAM

3.1 Monitoring Locations

Table 1 summarizes the location of monitoring wells and surface water monitoring stations. All monitoring locations including groundwater wells and the surface water monitoring stations are provided in **Figure 3**. Borehole logs are provided in **Appendix C**, and **Appendix D** contains photographs of the wells and surface water monitoring stations in Fall 2024.

3.1.1 Groundwater Monitoring Locations

Ten ground water wells were installed at and around the Black Donald WDS in 2001, 2002, 2008, and 2023. Details are as follows:

• Monitoring Well BH1

A bedrock well at a depth of 8.83 m located approximately 25 m east and downgradient of the landfilling area on the northwest side of Hydro Dam Road.

• Monitoring Well BH2

A bedrock well at a depth of 7.91 m located north and upgradient of the site.

• Monitoring Well BH3

A bedrock well at a depth of 8.83 m. This well was destroyed by site equipment in 2021 (Greenview, 2023). No samples were collected from this well in spring and fall 2024.

• Monitoring Well BH4

A bedrock well at a depth of 7.80 m located adjacent to the western corner of the landfilling area. It is interpreted to be located downgradient of the waste mound and in the immediate direction of the western portion of groundwater flow from the site.

• Monitoring well MW08-5

A bedrock well at a depth of 13.52 m situated approximately 140 m southwest of the landfilling area, and approximately 15 m from the western CAZ boundary in an area of elevated topography.

• Monitoring Well BH08-6

A bedrock well at a depth of 23.8 m on Crown land approximately 90 m west and upgradient of monitoring well **BH4.** This well was installed in 2008 to determine whether impacts resultant of landfill-related activities were occurring west of the site. This location was subsequently interpreted to be upgradient of the direction of flow and more representative of background conditions.

• Monitoring Well BH08-7S

An overburden well at a depth of 8m located approximately 180 m southeast and downgradient of the landfilling area, along the eastern CAZ boundary (installed in 2008).

Monitoring Well BH23-7D

A bedrock well at a depth of 16.56 m located approximately 180 m southeast and downgradient of the Approved Waste Disposal Area AWDA, along the eastern CAZ boundary, was installed in November 2023.

• Monitoring Well BH23-8S

A bedrock well at a depth of 14.35 m located approximately 40 m southeast of the landfilling area, was installed in November 2023.

• Monitoring Well BH23-8D

A bedrock well at a depth of 20.5 m located approximately 40 m southeast of the landfilling area, was installed in November 2023.

With the exception of monitoring well BH3, which was observed to have been destroyed in fall 2021 by site equipment (Greenview, 2023) all monitoring wells at the Black Donald Waste Disposal Site were observed to be in good condition in 2024, in accordance with O.Reg. 903 (Wells).



3.1.2 Surface Water Monitoring Locations

As part of the spring, summer and fall 2024 surface water sampling the physical characteristics of sampling locations SW4 (background) and SW5 were recorded. Locations SW3 and SW6 were removed from the 2024 program. Historically, SW3 and SW6 have not been interpreted to be impacted by landfill related activities (Greenview, 2023), and results from SW3 and SW6 were interpreted to be generally consistent with background surface water quality results at SW4.

In 2024, surface water samples were collected from two locations:

• Monitoring Location SW4

Background surface water station located approximately 500 m northeast and upstream of the AWDA of the Black Donald site.

• Monitoring Location SW5

Surface water location SW5 was relocated prior to the 2007 surface water monitoring program as per the Ministry TSS surface water review comments (Greenview, 2023). SW5 was relocated downstream of SW4, at a wetland area southeast of the site, at approximately the mid-point between background location SW4 and the furthest downstream sampling location SW3, and approximately 600 m southeast of the AWDA of the Black Donald Site.

3.2 Monitoring Procedures and Methods

All samplings were completed in general accordance with Jp2g Consultants Inc. standard operating procedures. Sampling methods and quality assurance measures are summarized and provided in **Appendix E**.

3.3 Monitoring Program 2024

Three (3) environmental monitoring events were completed by Jp2g in 2024 (April 15, July 30, and November 11). Groundwater sampling was completed in April and November and surface water sampling was completed in April, July, and November. The monitoring program included the collection of groundwater levels and the collection of water quality samples from selected ground and surface water monitoring stations. **Table 2** summarizes the sampling completed in 2024.

During the spring and fall 2024 sampling events, MW08-5 was documented to have insufficient groundwater for sampling purposes. MW08-5 has not been sampled due to low water conditions since October 2008. Monitoring well BH3 was observed to have been destroyed in fall 2021 (Greenview, 2023).

Based on the approved groundwater monitoring program for the Black Donald site, analysis of volatile organic compounds (VOCs) is conducted every five (5) years with the next testing scheduled for 2028.

3.4 Analytical Laboratory Accreditation

Ground and surface water samples were submitted for analysis to the Caduceon Environmental Laboratories (Caduceon), located in Ottawa, Ontario. Caduceon is accredited by the Canadian Association for Laboratory Accreditation (CALA), for specific environmental testing procedures listed in the scope of accreditation and is assessed biannually by CALA to the ISO/IEC 17025 standard. ISO/IEC 17025 is an international standard for both quality management and technical aspects of operating a testing laboratory. Caduceon is licensed by the Ministry to perform analysis on drinking water in Ontario in accordance with the Safe Drinking Water Act.



3.5 Landfill Gas Monitoring

Landfill gas monitoring is not part of the current environmental monitoring program for the site. However, WDS gas measurements were conducted at all monitoring wells in spring and fall 2024 using a landfill gas monitor (LGM). There were no detection of sulphide, methane or CO2 in any of the wells monitored with the exception of sulphide detected at 2 ppm at both MW08-5 and MW08-6. The waste mound at the Black Donald WDS is covered with porous soil materials, allowing natural gas flux to the atmosphere. The overburden and bedrock characteristics, coupled with the extended distance to the nearest residence, provide a minimal risk of landfill gases impinging off-site receivers.

3.6 Operational Monitoring

Operational monitoring at the Black Donald Site is typically completed by Township staff. As there was no waste received in 2024, no operational records were maintained.

The Township submits annual reports in accordance with the Municipal Data call, inclusive of the Black Donald site, to the Resource Productivity and Recovery Authority (RPRA).

4 ENVIRONMENTAL MONITORING RESULTS

4.1 Historical Data

Historical static water level and sampling results are presented in earlier reports completed by Greenview Environmental and are summarized in **Appendix F.**

4.2 Groundwater Flow Monitoring

Static water levels were measured in April and November 2024, and are summarized in **Appendix G**. Ground water flow patterns are provided in **Figures 4a** and **4b** for the April and November sampling events respectively. The water levels were referenced to a local datum. While there are minor fluctuations in the water levels, the overall direction of groundwater flow is consistent with historical measurements

In 2024, the interpreted groundwater flow at the site was interpreted to be consistent with historical results, as groundwater was interpreted to flow generally to the southeast.

4.3 Groundwater Quality Assessment

4.3.1 Groundwater Assessment Criteria

Groundwater at landfill sites is generally assessed with regard to the criteria specified in the Ontario Drinking Water Quality Standards (ODWQS). The ODWQS is split into health and non-health related parameters. Non-health related parameters are in turn split into aesthetic objectives and operational guidelines.



4.3.2 Groundwater Quality 2024

The Certificates of Analyses are presented in **Appendix H**, and the results of the 2024 groundwater monitoring program are tabulated in **Appendix I**. Analytical data were compared to the Ontario Drinking Water Standards (ODWS; MECP, 2006) and Ministry Guideline B-7 and the RUC (Ministry, 1994a).

Historically, background groundwater quality was calculated using the median values from the previous ten (10) sampling events from the background monitoring wells (BH2 and MW08-6). In 2024, the median of the previous ten (10) sampling event results from background monitoring well BH2 was used to determine background groundwater quality at the site.

Background Monitoring Well BH-2

In 2024, all parameters met the ODWQS at BH-2. Sporadic elevated hardness vales are likely attributable to the underlying marble bedrock as identified through borehole logs for the majority of wells, and from local bedrock exposure in the vicinity of the site. Similarly, high aluminum and DOC concentrations were interpreted to be result of naturally- occurring conditions and/or off-site sources in the vicinity of the site.

Monitoring Well BH1

In 2024, all parameters met the ODWQS except for

- field pH, DOC, and manganese in the spring, and
- \circ $\;$ alkalinity, hardness, DOC, manganese, and iron in the fall.

Groundwater at BH1 was interpreted to be the most representative of leachate quality at the Black Donald site. Consistent with historical assessments (Greenview, 2023), groundwater in the vicinity of BH1 was interpreted to be impacted from landfill-related activities. High parameter concentrations were expected, given the location of the monitoring well being immediately downgradient of the waste mound. Given the proximity of BH1 to Hydro Dam Road, impacts related to winter road maintenance activities were also interpreted in groundwater quality results at BH1.

Monitoring Well BH3

No samples were collected from BH3 in 2024. The well was destroyed by site equipment in 2021 (Greenview, 2023). The well was properly decommissioned in accordance with Regulation 903.

Monitoring Well BH4

In 2024, all parameters met the ODWQS except for, alkalinity, DOC, hardness, sulphate (fall only), TDS (spring only), manganese, iron, and aluminum (spring only). Based on 2024 results, groundwater at BH4 was interpreted to be impacted by landfill-related activities: however, to a lesser extent than at leachate monitoring well BH1.

Monitoring Well BH08-5

MW08-5 was observed to have insufficient groundwater for sampling purposes during the spring and fall 2024 sampling events, and groundwater samples could not be collected.

Monitoring Well BH08-6

In 2024, all parameters met the ODWQS at BH08-6. The high historical concentrations for aluminum, DOC, and hardness, and to a lesser extent iron and manganese at MW08-6 (and BH2) were interpreted to be due to the natural environment conditions in the area.



Monitoring Well BH08-7S (Historically MW08-7)

In 2024, all parameters met the ODWQS at MW08-7S. When compared with groundwater results from BH1, that is located immediately downgradient from the waste mound and interpreted to be impacted by the waste disposal site, results from MW08-7S in 2024 suggest that significant attenuation is occurring between BH1 and the eastern CAZ boundary. No significant impacts related to the waste disposal activities were interpreted to be occurring in the vicinity of MW08-7S in 2024.

Monitoring Well MW 23-7D

Monitoring well MW23-7D was installed in November 2023 and is located approximately 180 m southeast and downgradient of the landfilling area, along the eastern CAZ boundary. In 2024, all parameters met the ODWQS except for DOC.

Monitoring Wells MW23-85&D

Monitoring wells MW23-8S&D were installed in November 2023 and located approximately 40 m southwest of the landfilling area. During spring and fall sampling events in 2024, both wells were dry, and groundwater samples could not be collected.

VOC Sampling

As per the ECA, samples were last collected for VOC analysis from BH1 in 2023, and all values were below ODWS limits. Samples are collected at BH1 every five (5) years, and the next sampling event for VOC analysis at monitoring well BH1 is scheduled for 2028.

4.3.3 Reasonable Use Concept Assessment

The Reasonable Use Concept was developed by the Ministry to address the levels of off-site contaminants that are considered acceptable. The Reasonable Use Criteria allows for the definition of the level of contamination in the groundwater beyond which mitigative action should be undertaken. The acceptability of the landfill in terms of its impact on groundwater has been assessed in terms of the Reasonable Use Criteria (RUC). The RUC established the acceptability of change in groundwater quality (C_m) as follows:

Aesthetic Parameters

Degradation of less than 50% of the difference between the background quality and the established objective for the particular health related parameter.

Health Related Parameters

Degradation of less than 25% of the difference between the background quality and the established objective for the particular health related parameter. Acceptable concentrations are based on background levels and water quality guidelines (i.e. drinking water objectives).

The chosen background values are utilized to calculate the RUC allowable concentrations for specific parameters, as per the following formulas:

Health Related:	Non-Health Related:
$C_{allow} = P_b + (C_m - P_b) \times 25\%$	$C_{allow} = P_b + (C_m - P_b) \times 50\%$

where:

C_{allow} = Maximum allowable concentration of parameter as per the RUC guidelines.

C_m = Maximum acceptable concentration (MAC) of parameter as per the ODWS/OG.

P_b = Chosen background value of parameter

Black Donald Waste Disposal Site



For the purposes of determining the Reasonable Use Concept (RUC) criterion at the property boundary, groundwater quality from monitoring well **BH2** is considered to be a representative of background conditions at the site. Median values from the previous ten (10) sampling events from the background monitoring well **BH2** was used to determine background groundwater quality at the site.

Table 3 outlines the median calculation for background concentrations, and **Table 4** outlines the ReasonableUse Criteria.

4.3.4 Reasonable Use Conclusions 2024

The reasonable use conclusions and the indicator parameters that exceed the RUC for the April and November 2024 sampling events are presented in **Table 5.** Based on the direction of groundwater flow, the RUC assessment at the southeastern CAZ boundary conducted using results from monitoring wells MW08-7S & MW23-7D which are located approximately 180m southeast and downgradient of monitoring well BH1.

<u>MW08-7S:</u>

Results indicate that all parameters met the RUC criteria in 2024 except for DOC.

<u>MW23-7D:</u>

Results indicate that all parameters met the RUC criteria in 2024 except for alkalinity (spring only), TDS (spring only), manganese (fall only), and DOC.

The noted RUC non-conformance for DOC in 2024 is attributed to naturally occurring conditions upgradient of the site and/or off-site sources, and not to landfill-related factors.

4.4 Surface Water Quality Assessment

4.4.1 Surface Water Assessment Criteria

Surface water at landfill sites is generally assessed with regard to the criteria specified in the Provincial Water Quality Objectives (PWQO). The PWQOs are a set of ambient surface water quality criteria. In addition to the PWQOs, surface water quality results are, where relevant, compared to select Canadian Water Quality Guidelines (CWQGs).

4.4.2 Surface Water Monitoring 2024

Photos of the monitoring stations are included in **Appendix D**, the Certificates of Analysis are presented in **Appendix H**, and the results of the 2024 surface water monitoring program are tabulated in **Appendix I**. All surface water monitoring stations are provided in **Figure 3**.

Background surface water quality was determined using the 75th percentile of a minimum of the previous ten (10) sampling events from SW4.

Monitoring Location SW4

This station was dry during the fall 2024 sampling event. In spring and summer 2024 except for phosphorus (summer only) and iron, all parameter concentrations were below the PWQOs and other ambient surface water criteria.



Consistent with historical results, surface water quality at SW4 was interpreted to be representative of background surface water quality at the site. Background surface water quality at this location has been observed to have historically high concentrations of phenols, phosphorus, and zinc, and low DO concentrations, attributed to naturally occurring conditions and/or off-site sources.

Monitoring Location SW5

Beaver activity in the vicinity of SW5 has historically been observed; however, no specific beaver activity was noted in the vicinity of SW5 in 2024. In 2024, all parameter concentrations were below the PWQOs and other ambient surface water criteria except for phosphorous (fall only) and field pH (spring only).

Historically, SW5 has not been interpreted to be impacted by landfill related activities (Greenview, 2023), and in 2024 the noted PWQO non-conformances in results were interpreted to be consistent with expected results in a low to no-flow wetland environment. Given the significant distances of the surface water sampling locations (SW4 and SW5) from the Black Donald site, impacts as a result of the landfill site are not anticipated.

In 2024, no parameter concentrations at SW5 were above 75th percentile background surface water quality except as indicated in **Table 6** and include:

- July: Chemical oxygen demand COD and total kjeldahl nitrogen (TKN).
- November: Phosphorus.

4.5 Trigger Mechanism

The review of the groundwater and surface water Trigger Mechanism for the Black Donald Waste Disposal Site is provided below.

Consistent with the Trigger Mechanism (Greenview, 2010) the twelve (12) key trigger parameters included in the Trigger Mechanism were reviewed in detail including ammonia (un-ionized), barium, boron, chloride, chromium, chemical oxygen demand (COD), iron, nitrate, sodium, sulphate, total kjeldahl nitrogen (TKN) and total phosphorus. Based on the 2024 review, the Trigger Mechanism was not interpreted to be activated.

Monitoring wells BH2 and MW08-6 (background), BH1 and BH4 (leachate characterization), and MW08-7S (along flow path and receptor trigger location) were used for the Trigger Mechanism analysis for groundwater, while surface water locations SW-4 (background), and SW-5 (receptor trigger locations) were used for the Trigger Mechanism analysis for surface water at the Black Donald site

The following is a detailed review of each of the key trigger parameters used in the Trigger Mechanism evaluation. Generally, seasonal variations in concentrations are apparent.

4.5.1 Un-ionized Ammonia

The highest concentrations of un-ionized ammonia were noted in leachate characterization monitoring well BH1, while concentrations at all other key trigger locations appear to be relatively low and generally stable over time. With the exception of an increasing trend for un- ionized ammonia in results from leachate monitoring well BH1, no increasing trends were noted for concentrations of un-ionized ammonia at any of the other key trigger locations following inclusion of 2024 results. All un-ionized ammonia concentrations in surface water were below the PWQO limit.



4.5.2 Barium

The highest concentrations of barium were noted in leachate characterization monitoring wells BH1 and BH4, while low concentrations of barium were noted at the groundwater background locations (BH2 and MW08-6). The highest barium concentrations for the surface water monitoring locations were noted at background monitoring location SW4 in summer 2024. No increasing trends for concentrations of barium were noted at any of the key groundwater trigger locations following inclusion of 2024 results, and all barium concentrations were below the ODWS and RUC limits. The trend analysis indicated that barium concentrations were generally stable, downgradient and downstream of the Black Donald site. The Trigger Mechanism was not interpreted to be activated with respect to barium in 2024.

4.5.3 Boron

The highest concentrations of boron were noted in leachate characterization monitoring wells BH1 and BH4, while low concentrations of boron were noted at the groundwater background locations (BH2 and MW08-6), groundwater receptor trigger location MW08-7S, and background surface water location SW4. No increasing trends for concentrations of boron were noted at any of the key trigger locations following inclusion of 2024 results. All recent groundwater-related boron concentrations have been below RUC and ODWS limits. All recent surface water results have been below the PWQO limits. The trend analysis indicated that boron concentrations were generally stable downgradient and downstream of the Black Donald site. The Trigger Mechanism was not interpreted to be activated with respect to boron in 2024.

4.5.4 Chloride

The highest concentrations of chloride in groundwater were noted in results at MW08-7S in fall 2024, and in surface water at background surface water location SW4 in summer 2024, while low concentrations of chloride were noted at background groundwater locations BH2 and MW08-6. Following inclusion of 2024 results, chloride concentrations were generally stable downgradient and downstream of the Black Donald site, with the exception of an interpreted decreasing trend for chloride at leachate monitoring wells BH1 and BH4. All recently documented chloride concentrations have been below ODWS and RUC limits for both groundwater and surface water. The Trigger Mechanism was not interpreted to be activated with respect to chloride in 2024.

4.5.5 Chromium

All chromium concentrations in groundwater and surface water were noted to be below the detection limit. No increasing trends were noted for concentrations of chromium at any of the key trigger locations following inclusion of 2024 results. All concentrations in groundwater monitoring wells were significantly below the ODWS and RUC limits in 2024. Similarly, no concentrations in surface water were above the PWQO limit in 2024. The trend analysis indicated that chromium concentrations were generally stable downgradient and downstream of the Black Donald site. The Trigger Mechanism was not interpreted to be activated with respect to chromium in 2024.



4.5.6 Chemical Oxygen Demand (COD)

The highest concentrations of COD were noted at leachate monitoring well BH4, while the lowest concentrations of COD were noted at background groundwater location BH2. No increasing trends were noted for concentrations of COD at any of the key trigger locations following inclusion of 2024 results. The trend analysis indicated that some seasonal variability of COD concentrations downgradient and downstream of the Black Donald site is occurring. The Trigger Mechanism was not interpreted to be activated with respect to COD in 2024.

4.5.7 Iron

The highest concentrations of iron were noted at leachate characterization monitoring well BH1 and BH4 in fall 2024 and in surface water at SW4 in summer 2024, while significantly lower concentrations of iron were noted at all other groundwater and surface water sampling locations in 2024. Historically, iron concentrations in leachate monitoring well BH1 were significantly higher than concentrations documented for all other sampling locations. No increasing trends for concentrations of iron were noted at any of the other key trigger locations following inclusion of 2024 results with the exception of BH4, while decreasing trends were interpreted in results from BH1 based on 2024 results. Historically, only leachate monitoring well BH1 was noted to have concentrations of iron consistently in non-conformance with ODWS and RUC limits, while surface water locations were noted to have higher iron concentrations during summer and fall sampling events, which were attributed to low-water *I* low-flow environments at the sampling locations. The trend analysis indicated that iron concentrations were generally stable, downgradient and downstream of the Black Donald site. The Trigger Mechanism was not interpreted to be activated with respect to iron in 2024.

4.5.8 Nitrate

The highest concentrations of nitrate were noted at leachate characterization monitoring wells BH1 (fall) and BH4 (spring) in 2024, while low concentrations of nitrate were noted at all other groundwater and surface water sampling locations. With the exception of a minor increasing trend for concentrations of nitrate at leachate well BH-1, no increasing trends for concentrations of nitrate were noted at any of the key trigger locations following inclusion of 2024 results. All recent concentrations of nitrate from all sampling locations are significantly below the ODWS and RUC limits. The trend analysis indicated that nitrate concentrations were generally stable downgradient and downstream of the Black Donald site. The Trigger Mechanism was not interpreted to be activated with respect to nitrate in 2024.

4.5.9 Sodium

The highest concentrations of sodium were noted in leachate characterization monitoring well BH1 and BH4, while low concentrations of sodium were noted at the groundwater background locations (BH2 and MW08-6). The dominant source of sodium in the vicinity of the site is interpreted to be road salt (sodium chloride) from winter road maintenance and not landfill-related activities. All recent concentrations of sodium from all sampling locations were below the ODWS and RUC limits. The trend analysis indicated that sodium concentrations were interpreted to be generally stable, downgradient and downstream of the Black Donald site. The Trigger Mechanism was not interpreted to be activated with respect to sodium in 2024.



4.5.10 Sulphate

The highest concentrations of sulphate were noted in leachate monitoring well BH4, while low concentrations of sulphate were noted at the background groundwater locations (BH2 and MW08-6), groundwater receptor trigger location MW08-7S&D, and background surface water location SW4. All recent groundwater-related sulphate concentrations, with the exception of BH4 during the spring and fall 2024, have been below RUC limits, while all concentration at all locations have been below the ODWS limits. The trend analysis indicated that sulphate concentrations were generally stable, downgradient and downstream of the Black Donald site. The Trigger Mechanism was not interpreted to be activated with respect to sulphate in 2024.

4.5.11 Total Kjeldahl Nitrogen

The highest concentrations of TKN were noted in results from MW23-7D, while low concentrations of TKN were noted at the groundwater background locations (BH2 and MW08-6), and groundwater receptor trigger location MW08-7S, and background surface water location SW4 and SW5. A decreasing trend was interpreted in results from leachate monitoring well BH1. The trend analysis indicated that TKN concentrations were generally stable downgradient and downstream of the Black Donald site. The Trigger Mechanism was not interpreted to be activated with respect to TKN in 2024.

4.5.12 Total Phosphorus

The highest concentrations of total phosphorus have historically been documented in results from monitoring wells MW08-7S (previously MW08-7) and MW23-7D. The high total phosphorus concentrations in 2024 at MW08-7S and MW23-7D did not coincide with high concentrations at any upgradient monitoring wells or surface water locations, and therefore it was interpreted that phosphorus concentrations at these monitoring wells were not attributed to landfill-related factors.

High concentrations of phosphorus were noted in results from background surface water location SW4 and at SW5. No increasing trends for concentrations of total phosphorus were noted at any of the key trigger locations following inclusion of 2024 results. The trend analysis indicated that total phosphorus concentrations were generally stable, downgradient and downstream of the Black Donald site. The Trigger Mechanism was not interpreted to be activated with respect to total phosphorus in 2024.

4.5.13 Trigger Mechanism Review Summary

Based on a review of five (5) year time trend analysis for parameters un-ionized ammonia, barium, boron, chloride, chromium, COD, iron, nitrate, sodium, sulphate, TKN and total phosphorus, the Trigger Mechanism was not interpreted to be activated in 2024. Routine monitoring of groundwater and surface water should continue in 2025 at the Black Donald site.

4.6 Operations Summary

4.6.1 Site Operations

The site is operated as a municipal solid waste landfill, accepting C&D and bulky wastes for disposal, in accordance with ECA A411902 and the most recent amendment dated January 24, 2013 (**Appendix A**). The Black Donald site was closed to the public on April 5, 2010; Operational monitoring at the Black Donald Site is typically completed by Township staff. As there was no waste received in 2024, no operational records were maintained.



Access to the site is provided by Hydro Dam Road, located off Calabogie Road County Road 508, approximately 15 km southwest of the Village of Calabogie. Site access is restricted by a lockable gate at the site entrance, and the site is surrounded by forested lands, which provide adequate screening and restricted access for vehicular traffic.

4.6.2 Waste Disposal Summary

The Black Donald site is used only to stockpile C&D and bulky wastes generated from within the Township for processing (size-reduction) and disposal. No waste was received at the site in 2023 and 2024, the C&D and bulky waste was sent to the Mount St. Patrick site. The 2022 C&D and bulky waste stockpile was ground and applied at the site in fall 2023.

4.6.3 Monitoring and Screening Checklist

Appendix J contains the groundwater and surface water Monitoring and Screening Checklist. Based on the 2024 results, no contingency measures are required to be implemented.

5 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the 2024 environmental monitoring program completed for the Black Donald Waste Disposal Site, the following conclusions are provided:

- The groundwater flow direction at the site in 2024 was interpreted to be similar to historical interpretations with the direction of groundwater flow to the southeast to the CAZ boundary.
- Groundwater immediately downgradient from the site at monitoring wells BH1 was interpreted to be impacted from landfill-related activities in 2024. At monitoring wells BH1, all parameters met the ODWQS except for field pH, alkalinity, Hardness, DOC, manganese, and iron. Results from monitoring well BH1 were interpreted to be most representative of leachate quality at the Black Donald site at this time.
- Per the ECA, samples were last collected for VOC analysis from BH1 in 2023, and all values were below ODWS limits. Samples are collected at BH1 every five (5) years, and the next sampling event for VOC analysis at monitoring well BH1 is scheduled for 2028.
- No RUC exceedances were documented in results from downgradient monitoring well MW08-7S and MW23-7D in 2024 that were attributed to landfill-related factors. Based on the above, the Black Donald site was interpreted to meet the intent of Guideline B-7 at the downgradient southeastern CAZ boundary in 2024.
- Based on the surface water quality results in 2024, and the significant distance of each sampling location from the landfilling area of the Black Donald site, the surface water systems northeast and southeast of the Black Donald site were not interpreted to be impacted from landfill-related activities.
- Based on a review of five (5) year time trend analysis for parameters un-ionized ammonia, barium, boron, chloride, chromium, COD, iron, nitrate, sodium, sulphate, TKN and total phosphorus, the Trigger Mechanism was not interpreted to be activated in 2024. Routine monitoring of groundwater and surface water should continue in 2025 at the Black Donald site.
- Based on limited capacity the Township will file our application to expand the site in 2025.



5.1 Groundwater Monitoring

No changes to groundwater monitoring are recommended for 2025 as the three (3) new wells are included. Groundwater monitoring should continue to occur twice per year (May/June and October/November) and consist of the following (see **Table 7**):

- Water levels at all locations should be collected.
- Groundwater samples should be collected from all locations in spring (May/June) and fall (October/November) and include appropriate duplicate samples; and
- Samples should be analyzed for the parameters listed in Table 7.
- Any wells that are found to be damaged should be repaired or replaced.

5.2 Surface Water Monitoring

There are proposed changes to surface water monitoring recommended for 2025 adding three (3) more sampling locations. Surface water monitoring should continue to occur three times per year (May/June, July/August, and October/November) and consist of the following (see **Table 7**):

- Collect surface water from SW4 and SW5.
- Collect samples in May/June, July/August, and October/November.
- Samples should be analyzed for the parameters listed in **Table 7**.
- Un-ionized ammonia should be calculated using field results.



REFERENCES

Jp2g Consultants Inc., (2024). (2023) Annual Report, Black Donald Waste Disposal Site, Township of Greater Madawaska, Ontario. March 2024

CCREM (Canadian Council of Resource and Environment Ministers). 1987. Canadian Water Quality Guidelines. Prepared by the Task Force on Water Quality Guidelines.

Gartner Lee Limited, 1999. Hydrogeology and Monitoring of the Black Donald Landfill Site, Township of Brougham. February 1999.

Golder Associates Ltd., 2006. 2005 Annual Report, Black Donald Waste Disposal Site, Township of Greater Madawaska, Ontario. March 2006.

Golder Associates Ltd., 2007. 2006 Annual Report, Black Donald Waste Disposal Site, Township of Greater Madawaska, Ontario. March 2007.

Google Earth. May 8, 2004. January 3, 2013.

Greenview Environmental Management Limited, 2007a. Design and Operations Plan, Municipal Solid Waste Transfer Station, Black Donald Waste Disposal Site (A411902). July 23, 2007.

Greenview Environmental Management Limited, 2007b. Summary Report, Preliminary Landfill Expansion Feasibility Studies. August 31, 2007.

Greenview Environmental Management Limited, (2008-2023). (2007-2022) Annual Reports, Black Donald Waste Disposal Site, Township of Greater Madawaska, Ontario. March 2008.

Greenview Environmental Management Limited, 2010b. Design, Operations and Development Plan, Black Donald Waste Disposal Site, Township of Greater Madawaska, Ontario. December 2010.

Jp2g Consultants Inc., 2001. Township of Greater Madawaska, Black Donald Waste Disposal Site, Site Development and Operations Plan. January 2001.

Ontario Ministry of the Environment, 1994a. MECP Procedure B-7-1: Determination of Contaminant Limits and Attenuation Zones. 1994.

Ontario Ministry of the Environment, 1994b. Water Management: Policies, Guidelines, Provincial Water Quality Objectives of the Ministry of Environment and Energy. July 1994.

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

Ontario Ministry of the Environment, 2010. Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water - Technical Guidance Document. November 2010.

SGS Lakefield Research Ltd., 2005. 2004 Annual Report, Black Donald Waste Disposal Site. March 28, 2005.

Snider's Ecological Services, 2007. Initial Environmental Impact Study, Black Donald Waste Disposal Site, Township of Greater Madawaska. April 2007.



LIMITATIONS AND USE OF THE REPORT

This report was prepared for the exclusive use of Township of Greater Madawaska. Any use which a third party makes of this report, or and reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Jp2g Consultants Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This landfill impact report involves a limited sampling of locations to assess the probability of contamination on site. The test data, chemical analyses, and conclusions given herein are the results of analyzing the groundwater encountered during the sampling programs. Based upon the total number of test holes performed, these are considered to be fairly representative of the groundwater conditions within each area tested. It should be noted, however, that any assessment regarding the presence of contamination on the property is based on interpretation of conditions determined at specific locations and depths. Chemical results are limited to those parameters tested.

Tables

Table 1: Ground and Surface Water Locations

Groundwater Locations								
Monitor	Zone	Northing	Easting					
BH1	18T	5010512	353241					
BH2	18T	5010578	353185					
BH3 ⁽¹⁾	18T	5010421	353188					
BH4	18T	5010428	353115					
MW08-5	18T	5010294	353052					
MW08-6	18T	5010427	353017					
MW08-7S	18T	5010522	353374					
MW23-7D	18T	5010522	353374					
MW23-8S	18T	5010478	353265					
MW23-8D	18T	5010471	353265					

Surface Water Locations								
Monitor Zone Northing Easting								
SW-4	18T	5010921	353450					
SW-5	18T	5009774	353354					

Table 2: Monitoring Program 2024

Station ID	Station ID Monitorign Location		Summer 2023	Fall 2023	Notes			
<u>Groundwater</u>								
BH1	Leachate well northwest side of Hydro Dam Road	V		v				
BH2	North and upgradient of the landfill	v		v				
внз	South of the landfill	NS		NS	Destroyed in 2021			
вн4	Adjacent to the western corner of the landfill	v		v				
MW08-5	Southwest of the landfill	Dry		Dry				
MW08-6	West of the landfill	v		v				
MW08-7S	Southeast and downgradient of the landfill	v		v	Previously called MW08-7			
MW23-7D	Southeast and downgradient of the landfill	√ + DUP		٧	Installed in Nov. 2023 Previously called (MW08-7D)			
MW23-8S	Southeast of the landfill	Dry		Dry	Installed in Nov. 2023			
MW23-8D	Southeast of the landfill	Dry		Dry	Installed in Nov. 2023			
Surface Water								
SW4	Background northeast and upstream of the landfill	V	V	Dry				
SW5	Southeast and downstream of landfill area	v + DUP	√ + DUP	√ + DUP				

Notes:

1. v = sampled for the required parameters, field parameters and water level

2. DUP = Duplicate Sample taken

3. NS: Not sampled

Parameters (mg/L)	Apr-20	Oct-20	May-21	Nov-21	May-22	Oct-22	Jun-23	Nov-23	Apr-24	Nov-24	Median
Alkalinity	208	201	221	240	238	224	244	228	228	214	226
Chloride	1.1	1.1	0.9	0.7	<0.5	0.7	0.7	0.7	1.8	0.8	0.80
Nitrate	0.12	0.06	0.11	<0.05	0.09	0.16	<0.05	0.11	<0.05	0.14	0.11
Sulphate	13	17	13	16	15	10	12	16	13	14	14
TDS	225	234	233	242	251	235	253	252	242		242
DOC	2.6	2	2.1	5.7	2.2	0.8	0.8	2.6	2.8	2.2	2.20
Barium	0.018	0.019	0.019	0.021	0.02	0.02	0.031	0.02	0.015	0.018	0.02
Boron	0.01	<0.005	0.01	0.01	0.012	0.005	0.009	0.006	0.007	0.009	0.009
Iron	0.007	<0.005	<0.005	0.021	<0.005	0.005	0.015	<0.005	0.007	<0.005	0.01
Manganese	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Sodium	3	2.8	2.6	3.2	3.3	2.2	2.3	2.8	2.6	2.8	2.80

Table 3: Median Background Concentrations (Using BH2 Results)

Table 4: Reasonable Use Determination 2024 (Using BH2 results)

Parameter (mg/L)	Pb	Cm	F	Callow
Alkalinity	226	500	0.5	363
Chloride	0.8	250	0.5	125
Nitrate	0.11	10	0.25	2.6
Sulphate	14	500	0.5	257
TDS	242	500	0.5	371
DOC	2.2	5	0.5	3.6
Barium	0.02	1	0.25	0.3
Boron	0.009	5	0.25	1.26
Iron	0.01	0.3	0.5	0.16
Manganese	0.001	0.05	0.5	0.03
Sodium	2.8	200	0.5	101

Table 5: Reasonable Use Conclusions 2024

Parameters	ODWS	C _{allow}	MW	08-7S	MW23-7D (MW8-7D)				
			Apr-24	Nov-24	Apr-24	Nov-24			
Health Related									
Nitrate	10	2.60	<0.05	<0.05	0.14	<0.05			
Barium	1	0.30	0.044	0.055	0.076	0.09			
Boron	5	1.26	0.013	0.012	0.471	0.546			
Aesthetic Parameters									
Alkalinity	500	363	202	225	374	320			
Chloride	250	125	62.1	48.2	22.7	45.7			
Sulphate	500	257	14	4	21	27			
TDS	500	371	308		426				
DOC	5	3.6	3.9	3.7	9.4	7.2			
Iron	0.3	0.15	0.011	<0.005	<0.005	<0.005			
Manganese	0.05	0.03	<0.001	<0.001	0.015	0.13			
Sodium	200	101	25.3	37	17.5	31.9			

NS : Not Sampled

Exceeds Resonable Use Criteria

Table 6: Surface Water Triggers Assessment 2024

Deversedava		SW4	SW5						
Parameters	PWQO (CWQG)	75th Percentile	Apr-24	Jul-24	Nov-24				
Primary Surface Water Trigger Parameter ¹									
Chloride	120	NA	8	6.9	9.4				
Unionized Ammonia	0.02	NA	0.00000215	0.000185	0.000282				
Nitrate	13	NA	<0.05	<0.05	0.11				
Phosphorus	0.02	NA	0.02	0.01	0.04				
Boron	1.5	NA	0.016	0.023	0.015				
Iron	0.3	NA	0.032	0.292	0.226				
Secondary Surface Water Trigger Parameter ²									
Barium	NV	0.068	0.026	0.06	0.049				
Chromium	NV	0.001	<0.001	<0.001	<0.001				
Chemical Oxygen Demand (COD)	NV	22	20	30	15				
Sodium	NV	39	7.22	6.1					
Sulphate	NV	8.54	7	2	3				
Total Kjeldahl Nitrogen (TKN) NV 0.53		0.3 0.6		0.4					

NA : Not Applicable NV: No Value

Exceeds PWQO/CWQO Trigger Criteria

¹ Primary Surface Water Tigger uses the Provincial Water Quality Objective (PWQO)

- Since there is no PWQO for Chloride, the Canadian Water Quality Guideline (CWQG) of 120 mg/L is used

- For Boron, the CWQG of 1.5 mg/L is used since it is based on more up to date literatur

² Secondary Surface Water Trigger parameters do not have a PWQO.

- The running 75th Percentile of the (2016-2023) sampling events of the background (SW4) concentration is used as the trigger

Station ID	Task	Spring 2025	Summer 2025	Fall 2025	Analytical Parameters		
Groundwater	•		•		1		
BH1	Measure water levels / Sample groundwater	V		V			
BH2	Measure water levels / Sample groundwater	V		V			
внз	Decommissioned				- Major and minor ions (Ca, Na, Cl, SO4, B, K, Mg, Ba)		
BH4	Measure water levels / Sample groundwater	v		V	- Trace metals (Fe, Mn, Cu, Sr, Al, Cd, Cr, Co, Si, Zn, As, Pb, Hg) - Nitrogen species (NO3, NO2, NH3, TKN)		
MW08-5	Measure water levels / Sample groundwater	V		٧	 General parameters (pH, Conductivity, alkalinity, COD, phenols, total dissolved solids, phosphorous, hardness, dissolved organic carbon) Field measurements of pH, conductivity, Dissolved Oxygen, and water tempreture EPA 624 Volatile Organic Compounds VOC sample collected 		
MW08-6	Measure water levels / Sample groundwater	V		V			
MW08-7S	Measure water levels / Sample groundwater	v		V			
MW23-7D	Measure water levels / Sample groundwater	v		V	every Five years from BH1. Next VOCs sampling will be in Spring		
MW23-8S	Measure water levels / Sample groundwater	v		V			
MW23-8D	Measure water levels / Sample groundwater	v		v			
Surface Wate							
SW2	Sample Surface water	V	V	٧	- Major and minor ions (Ca, Na, K, Cl, total phosphorous, Ba, B, Mg, SO4)		
SW4	Sample Surface water	V	V	٧	 Trace metals (Fe, Mn, Cu, Cd, Cr, Co, Sr, Zn, As, Pb, Hg) with detect limits to PWQO Nitrogen species (NH3, TKN) General parameters (pH, Conductivity, alkalinity, COD, Total 		
SW5	Sample Surface water	V	V	V			
SW8	Sample Surface water	V	V	V	suspended solids, phenols, total dissolved solids, hardness, biochemi oxygen demand) - Field measurements of dissolved oxygen, pH, conductivity, water temperature, and Un-ionized ammonia (calculation)		
SW9	Sample Surface water	V	V	V			

Table 7 : Proposed Monitoring Program 2025

Notes:

One Duplicate Sample to be collected during each sampling event.

Figures








Black Donald Landfill Site - Greater Madawaska

Site Plan with Monitoring Locations

1.2ha Landfilling Area
Roadway
Vegetation
Sum Buffer
SW-4 Surface Water Locations
Contamination Attenuation Zone (CAZ)
MW08-6 Destroyed Well
NOTES : WELL LOCATION FROM HANDHELD GPS DURING THE SPRING 2023 SAMPLING SOURCE GREENVIEW 2022 AMR FOR REFERENCE ONLY
DRAFTED: QS PROJECT No.: 22-6213D
CHECKED: KM REVISION DATE: 13-01-2025
CHECKED: KM APPROVED: KM REVISION No.: .
SCALE: NTS Figure : 3



DRAFTED: QS PROJECT No.: 22-6213D CHECKED: KM REVISION DATE: 13-01-2025 CHECKED: KM APPROVED: KM REVISION No.: .	23-85 3-8D	90 90 85 (DRY) (DRY) (DRY) MW08-7S MW23-7D	80 (77.91) (78.22)
CHECKED: KM REVISION DATE: 13-01-2025 CHECKED: KM APPROVED: KM REVISION No.:		DRAFTED: QS	PROJECT No.: 22-6213D
		CHECKED: KM CHECKED: KM APPROVED: KM	REVISION DATE: 13-01-2025 REVISION No.:
SCALE: 1:1250 Figure : 4A		SCALE: 1:1250	Figure : 4A



MW08-7S MW23-7D (76.00) MW23-7D (76.62)
DRAFTED: QS PROJECT No.: 22-6213D CHECKED: KM REVISION DATE: 13-01-2025 CHECKED: KM APPROVED: KM REVISION No.: .
SCALE: 1:1250 Figure : 4B

Appendix A Environmental Compliance Approval and Certificate of Requirement

Ministry of the Environment Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A411902 Notice No. 3 Issue Date: January 24, 2013

The Corporation of the Township of Greater Madawaska 1101 Francis St Post Office Box, No. 180 Greater Madawaska, Ontario K0J 1H0



Site Location: Black Donald Waste Disposal Site 34 Hydro Dam Rd Greater Madawaska Township, County of Renfrew

You are hereby notified that I have amended Approval No. A411902 issued on March 27, 1980, and amended on October 12, 2001 and July 12, 2002 for the use and operation of a 1.2 hectare waste disposal site, as follows:

This Notice of Amendment updates the Approval to reflect current site operations, approves alternative daily cover and the Site Trigger and Contingency Plan.

The following definitions are added:

Ontario

"Approval" means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A".

"Construction and Demolition and Bulky Waste" or "C&D waste" means wastes resulting from construction, and includes the following: asphalt shingles, mattresses, furniture, carpet, tree stumps, drywall, wallboard, wood (painted and unpainted).

The following Conditions are revoked and replaced:

- (15) (a) The Owner shall develop the Site in accordance with the Site Design, Operations and Development Plan, dated December 22, 2010, item 7 of Schedule "A".
 - (b) The Site shall be constructed, operated and maintained in an environmentally safe manner, which minimizes the impacts of dust, odour, noise, litter, vector and vermin on the general public, Site

personnel, and the natural environment.

- (16) (a) The Site shall only receive only non-hazardous solid Construction and Demolition and Bulky Waste, and leaf and yard waste, generated from within the Township of Greater Madawaska.
 - (b) The Site may receive non-hazardous solid domestic waste from within the Township of Greater Madawaska, on a temporary basis, only with prior written authorization from the District Manager.
 - (c) Prior notification of 48-hours must be provided to the District Manager for receipt of any domestic waste.

MECE IVE

- (23) The Owner shall conduct weekly inspections of the equipment and facilities at the Site to ensure that they are maintained in good working condition at all times. Any deficiencies, which might negatively impact the environment, which are detected during these inspections shall be recorded in a log, and promptly corrected.
- (26) The Owner shall implement the Site surfacewater and groundwater monitoring program as described in Schedule "B" of this Approval.

Site Trigger and Contingency Plan

(29) The Owner shall establish the surfacewater and groundwater trigger and contingency plan, as described in Section 6.2 of the Design, Development and Operations Plan, item 7 of Schedule "A".

The following Conditions are added:

Waste Processing

- (35) (a) The Owner shall ensure that only Ministry-approved contractors carry out the processing of the Construction and Demolition and Bulky Waste at the Site.
 - (b) The Owner shall ensure that Construction and Demolition and Bulky Waste is stored and processed within the landfill footprint, as shown in Figure 6, Proposed Site Design, of item 7 of Schedule "A".

Leaf and Yard

- (36) (a) The Owner shall ensure that leaf and yard storage and composting is conducted as described in the Site Design, Operations and Development Plan, item 7 of Schedule "A".
 - (b) A maximum of 1000 cubic metres of leaf and yard waste may be temporarily stored within the staging area.
 - (c) Leaf and yard wastes shall be moved to the established composting area within three months of arrival

at the Site.

- (d) A maximum of 500 cubic metres of leaf and yard waste may be processed within the composting area at any time.
- (d) Composted leaf and yard waste may only be used as alternative daily cover at the Site, it may not be re-used by the public.

Cover

(37)(a) The Owner shall ensure that cover material is applied at the Site as follows:

- Intermediate Once every six (6) months, across the entire working face, and/or in areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 0.3 metre of soil or an approved thickness of alternative cover material shall be placed; and
- Final -In areas where landfilling has been completed to final contours, a minimum of 0.6 metre thick layer of final cover soil shall be placed, followed by 0.15 metre of topsoil.
 - (b) In the event that domestic waste is received at the Site on a temporary basis, daily cover shall be applied, at the end of each working day, consisting of a minimum of 0.15 m of soil.

Alternative Daily Cover

- (c) The Owner may apply the following materials as alternative intermediate cover, in the same thicknesses as described in Condition 37 (a):
 - leaf and yard waste mixed with soil cover and/or wood chips;
 - composted or partially-composted leaf and yard waste;
 - asphalt shingles;
 - clean wood chips;
 - contaminated soil non-hazardous;
 - processed C&D and bulky waste materials.

Schedule "A"

The following items are added to Schedule "A".

- Report entitled "Design, Operations and Development Plan, Black Donald Waste Disposal Site (A411902), Township of Greater Madawaska, County of Renfrew, Ontario", prepared by Greenview Environmental Management Limited, dated December 22, 2010.
- 8. Letter dated July 30, 2012, from Dan Hagan, Greenview Environmental Management, to Lynda Mulcahy, MOE, RE: Application for Approval of Waste Disposal Sites, Black Donald Waste Disposal Site (A411902), Township of Greater Madawaska, County of Renfrew, MOE reference number: 3866-CTJ5V, with responses to waste review comments and questions.
- e-mail from Dan Hagan, Greenview Environmental Management Limited, to Lynda Mulcahy, MOE, sent August 22, 2012, 9:57am, Subject: RE TGM - Black Donald WDS - Application for Approval of Waste Disposal Sites - MOE Request for Additional Information (MOE Reference Number: 3866-8CTJ5V)

Schedule "B" is added to the Approval

ė

Site Groundwater and Surfacewater Monitoring Program

Location	Frequency	Parameters
<u>Groundwater</u> BH1, BH2, BH3, BH4, MW08-5, MW08-6, MW08-7	Twice per year (Spring, Fall)	Alkalinity, aluminum, ammonia, barium, boron, cadmium, calcium, chromium, cobalt, chloride, COD,
I QA/QC	A 252A	copper, DOC, hardness, iron, magnesium, manganese, nitrate, phenols, potassium, silicon, sodium,
a na na ^{band} _p a o		strontium, sulphate, total phosphorus, TKN, TDS, zinc
		field measurements (pH, conductivity, temperature), water levels
BH1	Once every 5 years (Spring)	VOCs - EPA 624
Surface Water		Alkalinity, ammonia, BOD, boron,
SW-3, SW-4, SW-5, SW-6	Three Times (Spring, Summer, Fall)	cadmium, calcium, chloride, COD, copper, DOC, hardness, iron,
1 QA/QC	n de Agerra (gr	magnesium, manganese, nitrate, nitrite, phenols, potassium, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc, TSS
 For any support of grands of a grand of a		Field Measurements (pH, conductivity, dissolved oxygen, temperature, unionized ammonia (calculation))

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

Condition 15 was revised to reflect the updated Design, Operations and Development plan for the Site, and to ensure the Site does not cause nuisance or impacts.

Condition 16 was revised to clarify the currently-approved wastes that may be received at the Site.

Condition 23 was revised to update the Site inspection requirement.

Condition 26 was revised to reflect the updated Site monitoring programs.

Condition 29 was added to approve the Site trigger and contingency plan.

Condition 35 is added to ensure that storage and processing of construction and demolition wastes are carried out as described in the updated Design, Operations and Development plan, and are carried out in an environmentally-safe manner.

Condition 36 is added to ensure that leaf and yard waste storage and composting is carried out as described in the updated Design, Operations and Development plan, and are carried out in an environmentally-safe manner.

Condition 37 is included to specify cover requirements for the Site, to ensure operations to not cause impacts or nuisance.

Schedule B was added to the Approval to include the updated Site monitoring program.

This Notice shall constitute part of the approval issued under Approval No. A411902 dated March 27, 1980

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 24th day of January, 2013

THIS	NOTICE	WAS	MAILED	
	Fal	00		
	CAR.	$\frac{\partial O}{\partial r}$	2013	-
		2	C	
	(Signed)		-
		And in case of the local division of the loc	a because	- 6

Gebrezz

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

LM/

- c: District Manager, MOE Ottawa
 - Tyler H. Peters, Greenview Environmental Management Limited

SIRE BM CO3 250

Ontario

Ministry Ministère of the de Environment l'Environnement AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL WASTE DISPOSAL SITE NUMBER A411902 Notice No. 2

The Corporation of the Township of Greater Madawaska 1101 Francis Street Bagot, Blythfield And Brougham, Ontario K0J 1H0

MINISTRY OF ENVIRONIA

Site Location Black Donald Waste Disposal Site 34 Hydro Dam Road

Greater Madawaska Township, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A411902 issued on March 27, 1980, and amended on October 22, 2001 for submission of development and operations report as per Condition No. (14) of October 22, 2001 amendment, as follows:

Condition No. (14) is hereby revoked.

The following conditions of approval are added to the Provisional Certificate of Approval:

SITE OPERATIONS:

- (15) The Site shall be constructed, operated and maintained in an environmentally safe manner, which minimizes the impacts of dust, odour, noise, litter, vector and vermin on the general public, Site personnel, and the natural environment, all in accordance to the Development and Operations Plan, Items 4, 5 and 6 of Schedule "A".
- (16) The Site shall only receive non-hazardous municipal waste that is generated from within the Township of Greater Madawaska.
- (17) The normal daily hours of operation for receiving waste at the Site are 7 am to 9 pm.
 - (18) The total volumetric capacity of the Site, including waste, daily, interim and final cover, is
 46,785 cubic meters.
 - (19) The Owner shall ensure that there is no burning of waste, trees, brush and or clean wood piles at the Site.
 - (20) All incoming waste shall be inspected prior to being received at the Site to ensure that the Site is approved to accept such a waste.

- (21) The Owner shall ensure that all wastes at the Site are managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.
- (22) The Owner shall maintain records of the results of all inspections and monitoring and a summary of all activities associated with the Site (e.g. spills, maintenance work) in a record book located at the Site.
- (23) The Owner shall conduct daily inspections of the equipment and facilities at the Site to ensure that they are maintained in good working condition all the times. Any deficiencies, which might negatively impact the environment, detected during these inspections shall be recorded in a log, and promptly corrected.
- (24) (a) A sign shall be posted in a prominent location at the entrance of the Site stating the hours of operation, the Owner's name, staff contact and telephone number to call in the event of an emergency or any complaints;
 - (b) Complaints received from the public or adjacent neighbours shall be recorded in a log book created and maintained for this purpose.
- (25) (a) The Owner shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation at this Site;
 - (b) All spills and upsets shall be immediately reported to the Ottawa District Office or the Ministry's Spills Action Centre at 416-325-3000 or 1-800-268-6060, and the Municipality, and shall be recorded in a log book as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences; and
 - (c) All waste material resulting from a spill or process upset, shall be managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.

MONITORING AND REPORTING REQUIREMENTS

- (26) Surface and groundwater monitoring shall be conducted in accordance to Section 9.1 and 9.2, Item 4 of Schedule "A" provided that the following conditions are met:
 - (a) Prior to the development of the Site, the Owner shall establish that the seasonal high water table is at least one meter below the proposed excavation bottom;
 - (b) In addition to the parameters listed in Table 2, Section 9.1, Item 4 of Schedule "A", Nitrate and Ammonia shall be included for groundwater monitoring; and
 - (c) The background groundwater monitoring well (BH-1) shall be established further away from the waste pile, and one groundwater monitoring well shall be established at the midway point of the Site's southern boundary.
- (27) By March 31, 2003, and on an annual basis thereafter, the Owner shall submit to the District Manager, an annual report on the development, operation and monitoring of the Site, including any

Page 2 - NUMBER A411902

recommendations or changes to the annual monitoring program, in accordance to Section 10.1, Item 4 of Schedule "A".

A written approval from the District Manager shall be obtained for any changes to the annual monitoring program prior to these changes being implemented.

(a) In accordance to the Phased Plan outlined in Section 9.1, Item 4 of the Schedule "A", and by March 31, 2003, included in the annual monitoring report, the Owner shall submit to the District Manager for written approval, trigger levels for initiating investigative activities into the cause of an increase in contaminant concentrations as established by the surface and ground water monitoring programs along with appropriate investigative activities and contingency measures;

Within six (6) months from exceedance of the established trigger levels, the Owner shall submit to the Director for approval, the design of appropriate contingency measures and provide detailed plans, specifications and description for the design, operation and maintenance for the appropriate remedial actions; and

(c)

(a)

(b)

(c)

(31)

(b)

(28)

(29)

The remedial actions shall be implemented within nine months from the approval by the Director.

BUFFER AREA AND CONTAMINANT ATTENUATION ZONE

(30) Within 60 days of issuance of this Amendment, the Owner shall arrange for a legal survey of the Site and required buffer area, as specified in Items 4 and 5 of Schedule A, to be conducted by an Ontario Land Surveyor registered under the Surveyors Act.

By June 30, 2003, the Owner shall acquire the lands required for the contaminant attenuation zone in accordance to Figure 2 and Drawing 1, Item 4 of the Schedule "A". Alternatively, the Owner shall propose, by June 30, 2003, to the Director for approval, other methods for bringing the Site into compliance with respect to Guideline B-7, Reasonable Use Criteria and other applicable Ministry Regulations, Guidelines and Policies.

- By June 30, 2003, the Owner shall acquire lands required for the 30 meter southern and western buffer areas in accordance to Drawing 1, Item 4 of the Schedule "A".
 Alternatively, the Owner shall propose, by June 30, 2003, to the Director for approval, other Site development methods to allow for a 30 meter southern and western buffer within the current Site boundary.
 - (ii) The Owner shall not commence waste disposal activities on the southern and western Site boundary until Condition (31)(b)(i) has been met.

Within 30 days of purchase of lands noted in Condition (31)(a) and (31)(b), the Owner shall submit to the Director an updated legal survey of these lands for addition of these lands to the Certificate of Approval.

(32) The Owner shall ensure that no wastes are deposited within the designated 15 meter northern buffer area and the 30 meter eastern buffer area after the date of issuance of this Certificate of Approval.

PROHIBITION AND REGISTRATION ON TITLE

- (33) Pursuant to Section 197 of the EPA neither the Owner nor any person having an interest in the Site shall deal with the Site in any way without first giving a copy of this Certificate to each person acquiring an interest in the Site as a result of the dealing.
 - (a) The Owner shall:

(i) Within sixty (60) calendar days of the date of this Certificate, submit to the Director for the Director's signature two (2) copies of a completed Certificate of Prohibition containing a registerable description of the Site, in accordance with Form 1 of O. Reg. 14/92 (Document General- Form 4- Land Registration Reform Act); and

(ii) Within ten (10) calendar days of receiving the Certificate of Prohibition signed by the Director, register the Certificate of Prohibition in the appropriate Land Registry Office on title to the Site and submit to the Director immediately following registration the duplicate registered copy.

SITE CLOSURE

(34) Within 2 years prior to the Site reaching its final capacity specified in this Amendment, the Owner shall submit to the Director, for approval, a plan for closure, post closure monitoring and maintenance of the Site. The plan shall include but not be limited to the final contours of the Site, completion, inspection and maintenance of the final cover, an assessment of the adequacy of the monitoring and contingency plans and any other post closure monitoring and care.

The following items are added to SCHEDULE "A":

4. Township of Greater Madawaska, Black Donald Waste Disposal Site, Site Development and Operations Plan, Prepared by Jp2g Consultants Inc. dated January 2001.

5. Letter and accompanying documents dated November 13, 2001, from Brian Whitehead, Jp2g Consultants Inc., addressed to John Kaasalainen, MOE.

6. Letter dated March 13, 2002, from Nafiseh Pourhassani, P. Eng., MOE, addressed to Cathy Reddy, The Corporation of the Township of Greater Madawaska.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A411902 dated March 27, 1980 and amended on October 22, 2001.

Page 4 - NUMBER A411902

In accordance with Section 139 of the <u>Environmental Protection Act</u>, 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 <u>Environmental Protection Act</u>, provides that the Notice requiring the hearing shall state:

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

The Notice should also include:

The name of the appellant;

1.

2

3.

4.

5.

6. 7. The address of the appellant;

The Certificate of Approval number;

The date of the Certificate of Approval;

The name of the Director;

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*		*		The Director
Environmental Review Tribunal	0.758		3 Y	Section 39, Environmental Protection Act
2300 Yonge St., 12th Floor				Ministry of the Environment
P.O. Box 2382	AND		22	2 St. Clair Avenue West, Floor 12A
Toronto, Ontario			85	Toronto, Ontario
M4P 1E4		8 2		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 12th day of July, 2002



NP/

C:

District Manager, MOE Ottawa District Office Andrew Polley, MOE, Ottawa District Office Bruce Harman, Lakefield Research Ltd.

Ian Parrott, P.Eng. Director Section 39, Environmental Protection Act

Intario

Ministry Ministère of the da Environment l'Environnement AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL WASTE DISPOSAL SITE NUMBER A 411902

ilstah trading runa datas

OCT 2 5 2001

TAM!

Notice No. 1

Corporation of the Township of Greater Madawaska P.O. Box 180 1101 Francis Street, Calabogie, Ontario K0J 1H0

Site Location: Black Donald Waste Disposal Site Pt. Lot 9, Conc. 3, 34 Hydro Dam Road Geographical Township of Brougham Township of Greater Madawaska, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A 411902 issued on March 27, 1980 for an increase in the site service area to include the Township of Greater Madawaska, as follows:

The following conditions of approval are added to the Provisional Certificate of Approval:

DEFINITIONS

- (2) For the purpose of this Certificate of Approval, unless the contrary intention appears, the following words and phrases shall have the following meaning attributed to them:
 - 2.1 "Adverse Effect" is as defined in the Environmental Protection Act, R.S.O. 1990.
 - "Applicant" and/or "Owner" means the Township of Greater Madawaska. 2.2
 - 2.3 "Certificate" means the Provisional Certificate of Approval No. A 411902, as amended from time to time, including all schedules attached to and forming part of the Certificate.
 - 2.4 "Crown" means Her Majesty the Queen in Right of Ontario.
 - 2.5 "Director" means the one or more persons who from time to time are so designated for the purpose of Part V of the Environmental Protection Act.
 - 2.6 "District Manager" means the District Manager of the Ministry's Ottawa District Office.
 - 2.7 "EPA" means the Environmental Protection Act, R.S.O. 1990, Chapter E.19, as amended.
 - 2.8 "Ministry" and/or "MOE" means the Ontario Ministry of the Environment.
 - "ODWS" means the Ontario Drinking Water Standards, as amended. 2.9
 - "OWRA" means the Ontario Water Resources Act, R.S.O. 1990, as amended. 2.10

- 2.11 "PWQO" means the Provincial Water Quality Objectives, as amended.
- 2.12 "Site" means the entire waste disposal site including the landfilling area and the buffer lands as listed in Schedule "A" of the Certificate and consisting of approximately a 1.2 hectare landfill site.
- 2.13 "Supporting Documentation" refers to the reports listed in Schedule "A" of the Certificate.

GENERAL

(3)

(4)

(5)

(6)

(a)

(b)

The requirements specified in this Provisional Certificate of Approval are the requirements under the <u>Environmental Protection Act</u>, R.S.O. 1990. The issuance of this Provisional Certificate of Approval in no way abrogates the Applicant's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.

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

The Applicant shall ensure compliance with all the terms and conditions of this Provisional Certificate of Approval. Any non-compliance constitutes a violation of the <u>Environmental Protection Act</u>, R.S.O. 1990 and is grounds for enforcement.

The Applicant shall, forthwith upon request of the Director, District Manager, or Provincial Officer (as defined in the Act), furnish any information requested by such persons with respect to compliance with this Provisional Certificate of Approval, including but not limited to, any records required to be kept under this Provisional Certificate of Approval; and

In the event the Applicant provides the Ministry with information, records, documentation or notification in accordance with this Provisional Certificate of Approval (for the purposes of this condition referred to as "Information"),

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

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

The Applicant shall allow Ministry personnel, or a Ministry authorized representative(s), upon presentation of credentials, to:

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

without restricting the generality of the foregoing, to:

(7)

(8)

(a)

(b)

- (i) enter upon the premises where the records required by the conditions of this Provisional Certificate of Approval are kept;
 - (ii) have access to and copy, at reasonable times, any records required by the conditions of this Provisional Certificate of Approval;
 - (iii) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the conditions of this Provisional Certificate of Approval; and
 - (iv) sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Provisional Certificate of Approval.
- (a) Where there is a conflict between a provision of any document referred to in Schedule "A", and the conditions of this Provisional Certificate of Approval, the conditions in this Provisional Certificate of Approval shall take precedence; and
- (b) Where there is a conflict between documents listed in Schedule "A", the document bearing the most recent date shall prevail.
- (9) The Applicant shall ensure that all communications/correspondence made pursuant to this Provisional Certificate of Approval includes reference to the Provisional Certificate of Approval number A411902.
- (10) The Applicant shall notify the Director in writing of any of the following changes within thirty (30) days of the change occurring:
 - (a) change of Applicant or operator of the Site or both;
 - (b) change of address or address of the new Applicant;

(c)

change of partners where the Applicant or operator is or at any time becomes a partnership, and a copy of the most recent declaration filed under the <u>Business</u> <u>Names Act</u>, 1991 shall be included in the notification to the Director;

- (d) any change of name of the corporation where the Applicant or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (form 1 or 2 of O. Reg. 182, Chapter C-39, R.R.O. 1990 as amended from time to time), filed under the <u>Corporations Information Act</u> shall be included in the notification to the Director; and
- (e) change in directors or officers of the corporation where the Applicant or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" as referred to in 9(d), supra.
- (11) In the event of any change in ownership of the Site, the Applicant shall notify, in writing, the succeeding owner of the existence of this Provisional Certificate of Approval, and a copy of such notice shall be forwarded to the Director.
- (12) Any information relating to this Provisional Certificate of Approval and contained in Ministry files may be made available to the public in accordance with the provisions of the <u>Freedom of Information and Protection of Privacy Act</u>, R.S.O. 1990, C. F-31.
- (13) All records and monitoring data required by the conditions of this Provisional Certificate of Approval must be kept on the Owner's premises for a minimum period of two (2) years from the date of their creation.

DEVELOPMENT AND OPERATIONS

- (14) Within 3 months of the date of this Notice, the Applicant shall submit to the Director for approval an updated development and operations report and supporting hydrogeological study outlining how the remaining capacity of the Site is to be utilized. These reports shall include the following information
 - site plans showing the waste disposal footprint, buffer zones, and contaminant attenuation zones, if required, including the ownership of such lands;
 - site operation and development plans;
 - daily/intermediate/final cover requirements;
 - security, fencing, signage, site supervision, housekeeping and screening requirements;
 - surface drainage plans, leachate and gas control plans;
 - a proposed monitoring program for landfill gas, leachate, groundwater, and surface water including trigger mechanisms and contingency plans;
 - reporting requirements; and
 - closure plans.

All in accordance with the following plans and specifications which are added to Schedule "A" of the Certificate:

The Application for a Provisional Certificate of Approval for a Waste Disposal Site dated January 11, 2001 as signed by Cathy Reddy, Clerk Treasurer of the Township of Greater Madawaska.

The letter dated January 31, 2001 to Mr. A. Dominski of the Ministry of the Environment, Environmental Assessment and Approvals Branch from Mr. Brian Whitehead of Jp2g Consultants Inc. providing the purpose and basis for this amendment.

The letter dated March 1, 2001 to Mr. A. Dominski of the Ministry of the Environment, Environmental Assessment and Approvals Branch from Mr. Brian Whitehead of Jp2g Consultants Inc. requesting that the proposed amendment be split into two parts, one for the service area change and another for the site development aspects as well as the reasons for this request.

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

The reasons for this amendment are to allow for an increase in service area for the waste disposal site and to update the Certificate to meet the Ministry's current requirements.

The reasons for each of the conditions of approval are as follows:

The reason for Condition (2) is to define the specific meaning of terms used to simplify the conditions in this Certificate.

2) The reason for Conditions (3), (4), (5), (8), (9), (10), (11), (12) and (13) is to clarify the legal rights and responsibilities of the Owner.

3)

1)

1.

2.

3.

The reason for Condition (6) and (7) is to ensure that the appropriate Ministry staff have ready access to information and the operations of the Site which are approved under this Provisional Certificate of Approval. Condition (7) is supplementary to the powers of entry afforded a Provincial Officer pursuant to the Environmental Protection Act, the Ontario Water Resources Act, and the Pesticides Act, as amended.

4) The reason for Condition (14) is to ensure that the continued use and operation of the Site is done in an environmentally acceptable manner.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No.A. 411902 dated March 27, 1980, as amended.

In accordance with Section 139 of the <u>Environmental Protection Act</u>, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the <u>Environmental Protection Act</u>, provides that the Notice requiring the hearing shall state: The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and; The grounds on which you intend to rely at the hearing in relation to <u>each</u> portion appealed.

The Notice should also include:

The name of the appellant;

3. 4:

5.

6.

7.

8:

JK/

c:

The address of the appellant;

The Certificate of Approval number;

The date of the Certificate of Approval;

The name of the Director;

The municipality within which the waste disposal site is located;

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

This Notice must be served upon:

The Secretary* Environmental Appeal Board 2300 Yonge St., 12th Floor P.O. Box 2382 Toronto, Ontario M4P 1E4

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 Appeal Board's requirements for an appeal can be obtained directly from the Board at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

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

DATED AT TORONTO this 12th day of October, 2001

THIS	NOTICE WAS MAILED
ON_	Oct. 22 2001
	lc lc
	(Signed)

	~	· · · · · · · · · · · · · · · · · · ·
-		-
A		70.
In	Mast	1 2
-		

Ian Parrott, P.Eng. Director Section 39, Environmental Protection Act

District Manager, MOE Ottawa Brian Whitehead, Planner, Jp2g Consultants Inc.

Ontario	C
Ministry of the Environment	133 Dalton St., Box 820 Kingston, Ontario K7L 4X6
Township of Brougham Dacre, Ontario NOJ 1NO	March 27, 1980

RE: Dump Site Lot 9, Concession III Township of Brougham County of Renfrew

1.

The enclosed revised Provisional Certificate of Approval contains a condition requiring it be registered on title. The reason for this condition is attached to the Certificate.

Two copies of the Certificate and reasons are on long paper to facilitate registration. Both of these should be taken to the Land Registry Office and one returned to the Director with registration particulars.

If your Certificate does not contain sufficient legal description for registration because you have not given one to the Director, you will have to provide one under Section 23(1) (e) of The Registry Act or in your application under The Land Titles Act.

In the event that the site including its buffer, is part of a larger parcel of land and you do not wish to prepare a new survey at this time, you may register the Certificate against the larger parcel of land. If you do so, the Director is prepared, if requested in the future.

In the case of land recorded under The Land Titles Act, to consent to an application to delete the registration from the title of lands not within the site including its buffer zone, and

In the case of land recorded under The Registry Act, to issue a Certificate that lands not used for the actual disposal of waste or buffer zone have not been so used.

Such documents would be issued after suitable draft documents including legal description were submitted by you or your successor. The purpose of such documents would be to assure subsequent purchasers that the lands in question were not affected by section 46 of the Environmental Protection Act.

Yours very truly

Ministry of the Environment

Ontario

Provisional Certificate No. A 411902

PROVISIONAL CERTIFICATE OF APPROVAL WASTE DISPOSAL SITE

ᡐᡐᡐᠣᠯ᠔᠋ᡷ᠖᠔ᢅᢞ᠖᠔᠅ᡬ᠕

Under The Environmental Protection Act, 1971 and the regulations and subject to the limitations thereof, this Provisional Certificate of Approval is issued to:

Township of Brougham Dacre, Ontario NOJ 1NO

for the use and operation

of a 1.2 hectare dump site

all in accordance with the following plans and specifications:

Located:

Lot 9, Concession III Township of Brougham County of Renfrew

which includes the use of the site only for the disposal of the following categories of waste (NOTE: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval) domestic and 5% other wastes, limited to scrap metal, brush,

lumber and construction debris.

and subject to the following conditions:

1. No operation shall be carried out at the site after sixty days from this condition becoming enforceable unless this Certificate including the reasons for this condition has been registered by the applicant as an instrument in the appropriate Land Registry Office against title to the site and a duplicate registered copy thereof has been returned by the applicant to the Director.

THIS IS A TRUE COPY OF	THE
ON An 9/83	1
(Signod)	

Dated this 27th day of March , 19 80.

(TOUL	: ; ;
Director, Section 39,	
The Environmental Protection Act to:	

Ministry of the Environment



TO: Township of Brougham Dacre, Ontario NOJ 1NO

You are hereby notified that Provisional Certificate of Approval No. A 411902 has been issued to you subject to the conditions outlined therein.

NOTICE

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

The reason for the condition requiring registration of the Certificate is that Section 46 of The Environmental Protection Act, 1971 prohibits any use being made of the lands after they cease to be used for waste disposal purposes in order to protect future occupants of the site and the environment from any hazards which might occur as a result of waste being disposed of on the site. This prohibition and potential hazard should be drawn to the attention of future owners and occupants by the Certificate being registered on title.

You may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board.

This Notice should be served upon:

The Secretary, Environmental Appeal Board, AND 1 St. Clair Ave. West, 5th Floor, Toronto, Ontario. M4V 1K7 The Director, Section 39 Ministry of the Environment,

DATED

this 27th day of March , 1980 .

AADAILI

, **, `**

a 8

						·		<u> </u>
	Province of Onterio	D Form		ion Reform Act, 1984		Abs	V •••	E & OLIPOUM CO. LINTE Form No. BES
		S253	(1) Registry	Z Land Titles		(2) Page 1 of	2 pages	1040
ينه ا	NON LINE		(3) Property Identifier(s)	Block 57375	Pro	perty 20 (P)		
ш —	TRAT NEW TOKE	<u> </u>	(4) Nature of De	57375	00	30 (R)		Schedule
6		20	DISPOSAL	SITE, CERTIFICA	TE O	F PROHIBITION F APPROVAL NO	V FOR WA	STE 02
	60		(5) Consideration	1 (2), ENVIRONM	ENTA	L PROTECTION	ACT	
Č v	AT DE LE C	3				Dollars S		
	三 三日 立時	No.	(6) Description					{
OFF		1440	Part of	Lot 9, Con 2				
EO.			Geogra	hic Township of	Bro	ugham , Town	ship 6	F
			being P	arts 1 to 4, P	lan 4	^{I9R-15646} (reat	r,
New Property Ic	lentifiera	Additional:				٨	1adas	sta Suri
Erenutions.		Schedule						
crecoupits			(7) This	(a) Redescription	1.05	Scherlute for:		
		Additional: See Schedula	Contains:	New Essement Plan/Sketch	ן ר	Description	ddillonal Parties	Dther
(8) This Document	provides as follows:		<u> </u>	مع بن بن من ا			L	
	See Schedul	e						
							2	
								1
								1
						-		
(9) This Document r	states to instrument n	umber(s)				Con	tinued on S	chedule
10) Party(ies) (Set o	out Status or Interest)							
Name(s)			S	ignature(s)	л		Date o	f Signature
MINISTRY OF '	THE ENVIRONMEN	T		mai	Na	dinte	2006	12 24
By one of its Appointed un	a Directors	vomental Pre	tection Act		1,7 NY 1,1.4	energiante		
			10002001 1000		11.7	man	•• [•••••	
• • • • • • • • • • • • •				•••••	• • • •			
11) Address								
for Bervice	St. Clair Av	venue West,	Floor 12A,	Toronto, Ontari	.0,⊻	4V 115 -		J
12) Party(lae) (Set o Name(s)	ut Status or Interest)		s	iconture(s)			Date o	of Signature
				A. mrn.ofat			Y	M D
• • • • • • • • • • • • • •		••••••	• • • • • • • • •		• • • •	• • • • • • • • • • • • •		
			• • • • • • • •	,				
3) Address for Service								· · ·
14) Municipal Addre	ss of Property	(15) Doc	ument Prepared b	r	- 10	Feas	and Tax	
not essig	med	HOWAR	DA. LITHWI	X vitor	A SNC	Registration Fee	60.	00
		300-3	Boberston	Road	LISE (
		Ottaw	a (Nepean),	ON KZH 8R2	<u>i</u>			
					6			
	• :					Totel		

10174 (12/84)

JSCHRDEDER



Appendix B MOE Correspondence Ministère de l'Environnement, de la Protection de la nature et des Parcs





BLACK DONALD WASTE DISPOSAL SITE

Inspection Report

System Number: A411902 Entity: THE CORPORATION OF THE TOWNSHIP OF GREATER MADAWASKA Inspection Start Date: 10/07/2022 Inspected Date: 11/21/2022 Inspected By: Thandeka Ponalo Badge #: 1718

Thandeka Ponalo

(signature)



NON-COMPLIANCE/NON-CONFORMANCE ITEMS

The following item(s) have been identified as non-compliance/non-conformance, based on a "No" response captured for a legislative or best management practice (BMP) question (s), respectively.

Question Group: Other Inspection Findings

Question ID	949100	Question Type	Legislative
Question:			
Were the inspection question	ns sufficient to address o	other identified non-	-compliance items?
Legislative Requirement	Not Applicable		
Observation/Corrective Action(s)			
The following instances of non-compliance were also noted during the inspection:			
At time of the inspection, Township staff stated that the site likely has an operational			

At time of the inspection, Township stall stated that the site likely has an operational capacity of only two (2) years instead of five (5) years as stated in the 2021 Annual Report. This would require the submission of a Closure Plan as outlined in Condition 34 of the ECA. Furthermore, staff stated that some areas of the landfill have exceeded their contours by an estimated 2.4 metres which may further reduce the operational capacity of the landfill. Township staff stated that the Township is exploring submitting an expansion request to extend the life of the site that would also increase the final contours of the landfill to accommodate areas where final contours have been exceeded.

ACTION

1. The Township shall conduct an assessment of the approved waste disposal area to determine the accurate remaining capacity of the site.

2. The Township shall submit to the Ministry a drawing of the landfilling area that shows the areas that have been overfilled in relation to the approved final contours.

3. The Township shall submit to the Ministry an action plan to address how the site will be brought back into compliance in relations to the approved landfill design and capacity limits.

Ministère de l'Environnement, de la Protection de la nature et des Parcs



INSPECTION DETAILS

This section includes all questions that were assessed during the inspection.

Ministry Program: WASTE | Regulated Activity: Landfills

Question ID	NOL 1	Question Type	Legislative
Question:			
Does the Open landfill site have an Environmental Compliance Approval (ECA)?			
Legislative Requirement	gislative Requirement EPA 27 (1);		
Observation			
Yes ECA Number A411902 was issued on March 27, 1980 and amended, October 12, 2001, July 12, 2002 and January 24, 2013.			
Question ID	NOL 3	Question Type	Legislative
Question:			
Does the holder of the landfill ECA own the entire site?			

Legislative Requirement EPA | 27 | (1); EPA | O. Reg. 232/98 | 3;

Observation

Yes

The site is approved for a 1.2 ha landfill site within a total licensed property area of 21.36 ha, inclusive of lands used for operational buffer and contaminant attenuation zone (CAZ) purposes.

Question ID	NOL 4	Question Type	Information
Question:			
Does the landfill have a Conta	aminant Attenuation Zo	ne (CAZ)?	
Legislative Requirement	Not Applicable		
Observation			
Yes			

Question ID	NOL 13	Question Type	Information



Question:

Are access roads and on-site roads provided so that vehicles hauling waste to and on the site may travel readily on any day under all normal weather conditions?

Legislative Requirement	EPA 27 (1);
-------------------------	-----------------

Observation

Yes

Access to the site is provided by Hydro Dam, located off County Road 508 near Black Donald Lake approximately 15 km southwest of the Village of Calabogie. The 2021 Annual Report states that the site access road extending from Hydro Dam has sufficient width at the entrance and within the site to allow for unimpeded winter travel and access for emergency and snow removal equipment. At time of the inspection, the access road was well maintained and in good condition.

Question ID	NOL 14	Question Type	Legislative
Question:			
Is site access limited to times when an attendant is on duty?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

The site was closed to the public on April 5, 2010, however, disposal operations at the site are currently available for municipal vehicles and Township-approved haulers only under supervision of Township operations staff. The 2021 Annual Report states that the site is restricted by a lockable gate at the entrance, and the site is surrounded by forested lands which provides adequate screening and restricts access for vehicular traffic. At time of the inspection, Township staff confirmed that the site gate is kept locked and only Township approved commercial vehicles are allowed on site when the site attendant is present.

Question ID	NOL 15	Question Type	Legislative
Question:			
Does the site only receive wa	ste from within its appr	oved service area?)
Legislative Requirement	EPA 27 (1);		
Observation			
Yes In accordance with Condition Township of Greater Madawa	16 of the ECA, the site ska.	only receives was	te from the

Ministère de l'Environnement, de la Protection de la nature et des Parcs



Question ID	NOL 16	Question Type	Information
Question:			
Is the site required to have a ground water monitoring program by the ECA?			
Legislative Requirement	egislative Requirement Not Applicable		
Observation			
Yes Groundwater requirements are outlined in Conditions 26 to 29 and in Schedule "B" of the ECA. It is the responsibility of the Township to ensure the site's groundwater parameters at the property boundary meet those as calculated by Guideline B-7: Reasonable Use Guideline (RUG).			
The 2021 Annual Report states that groundwater configuration at the site was consistent with historical interpretations with the east-west oriented groundwater divide evident in the vicinity of the waste mound, and predominant flow directions to the east, west and southeast. The report states that based on 2021 results, it is interpreted that the site meets the intent of Guideline B-7 and is interpreted to be in compliance with RUC in 2021 at the southwestern CAZ boundary. At the time of the inspection, no leachate seeps or odours were observed at the site. The 2021 Annual Report has not been reviewed by the Technical Support Section.			
Question ID NOL 20 Question Type Information			
Question:			
Is there ongoing abatement to address any concerns the ministry has with the ground water monitoring?			
Legislative Requirement	Not Applicable		
Observation			
No			
Question ID	NOL 21	Question Type	Information
Question:			
Is the site required to manage leachate by the ECA?			
Legislative Requirement	Not Applicable		

Observation



No

There is no leachate control system at this landfill site. The site is a natural attenuating landfill.

Question ID		Question Type	Information
	NOL 20	Question Type	Information
Question:			
Is the site required to manage	e landfill gas by the EC	Α?	
Legislative Requirement	Not Applicable		
Observation			
No There is no methane gas control system at the site.			

Question ID	NOL 31	Question Type	Information
Question:			
Is the site required to have a	surface water monitorin	ng program by the I	ECA?
Legislative Requirement	Not Applicable		
Observation			
Yes Surface water requirements a ECA. It is the responsibility of on and off-site meet those as The 2021 Annual Report state the significant distance of eac the site, the surface water sys impacted from landfill-related DO (low), phosphorus, iron ar sampling dates were attribute as to low-flow surface water of location SW-6 was interpreted The 2021 Annual Report was	the Township to ensur stated in the Provincial es that based on the such stated in the Provincial es that based on the such stems south and souther activities. Non-conform activities. Non-conform activities. Non-conform activities. Non-conform activities. The high pH d to be naturally occurr conditions. The high pH d to be anomalous.	ns 26 to 29 and in S re the site's surface I Water Quality Obj inface water quality m the approved wa east of the site is no hances of PWQO for t select sampling for value in the backgrou value in the summ	Schedule "B" of the water parameters fectives (PWQO). results in 2021, and aste disposal area of ot interpreted to be or concentrations of ocations for select and (SW-4), as well her of 2021 at

Question ID	NOL 36	Question Type	Legislative
Question:			

Is proper equipment available for the compaction of waste and applying cover material?

capacity is 4,400 cubic meters.

Ministère de l'Environnement, de la Protection de la nature et des Parcs



Legislative Requirement	EPA 27 (1);
Observation	
Yes	

Question ID	NOL 37	Question Type	Legislative		
Question:					
Is the landfill able to accurately determine the amount of waste received?					
Legislative Requirement	EPA 27 (1);				
Observation					
Yes A specialized survey and design technique referred to as digital terrain modelling (DTM) is used to determine waste landfilled at the site. The DTM method is a computer-based process that compares two (2) topographic surfaces or digital terrain models and calculates the prismoidal volumetric difference. The 2021 Annual Report states that the topographical survey was completed on December 14, 2021 and it was estimated that the remaining site					

Question ID	NOL 38	Question Type	Legislative		
Question:					
Are all disposal operations at the site adequately and continually supervised?					
Legislative Requirement	EPA 27 (1);				
Observation					
Yes Disposal operations at the site are currently available for municipal vehicles and Township- approved haulers only under supervision of the site attendant. To address previous dumping concerns, cameras were installed at the site.					
Question ID	NOL 39	Question Type	Information		
Question:					
Does the landfill operator have a site inspection program as required by the ECA?					
Legislative Requirement	Not Applicable				
Observation					
Yes					


As per Condition 23 of the ECA, weekly inspections of the equipment and facilities shall be conducted to ensure that they are maintained in good working condition at all times. Any deficiencies, which might negatively impact the environment, which are detected during these inspections shall be recorded in a log and promptly corrected.

At time of the inspection, weekly inspection reports were requested and provided.

Question ID	NOL 40	Question Type	Legislative
Question:			
Does the landfill operator have a procedure in place to address issues identified by staff during the site inspection?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes Staff record any deficiencies and corrective actions identified during weekly inspections in the weekly inspection form.			

Question ID	NOL 41	Question Type	Legislative
Question:			
Is the waste being compacted adequately?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

Question ID	NOL 42	Question Type	Legislative
Question:			
Is Daily cover applied to the waste at the end of each working day or as otherwise specified in the ECA?			
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 7;		
Observation			
Yes Condition 37(c) of the ECA states that processed C&D waste and bulky waste materials can be used as alternative cover. At time of the inspection, staff stated they used C&D waste as alternative cover.			

Ministère de l'Environnement, de la Protection de la nature et des Parcs



Question ID	NOL 43	Question Type	Legislative
Question:			
Are procedures implemented	to control rodents or ot	her animals and in	sects at the site?
Legislative Requirement	EPA 27 (1);		
Observation			
Yes Condition 15 of the ECA requires the site shall be constructed, operated and maintained in an environmentally safe manner, which minimizes the impacts of dust, odour, noise, litter, vector and vermin on the general public, site personnel, and the natural environment, all in accordance to the Development and Operations Plan, Items 4, 5 and 6 of Schedule "A". At time of the inspection, staff stated that as they only accept C&D waste, leaf and yard waste, and non-hazardous domestic waste only during emergencies, they have not had problems with rodents and other animals.			
Question ID	NOL 44	Question Type	Legislative
Question:			
Is site access restricted by us operating?	e of a gate, fence, or p	hysical barrier whe	n the site is not
Legislative Requirement	EPA 27 (1);		
Observation			
Yes The site is surrounded by forested lands, and they have a gate they keep locked when Township staff are not on site.			
Question ID	NOI 45	Question Type	
Question:		Question Type	
wuestion.			
Is the waste disposal area ad	equately screened from	n public view?	

Observation

Yes

The site is surrounded by forested lands that screen the site from public view.

Ministère de l'Environnement, de la Protection de la nature et des Parcs



Question ID	NOL 47	Question Type	Legislative
Question:			
Has the annual operations report been submitted to MECP or available on site as required by the ECA?			on site as required
Legislative Requirement	EPA 27 (1);		
Observation			
Yes In accordance with Condition Manager by March 31st.	27 of the ECA, the An	nual Report was pr	ovided to the District
Question ID	NOL 48	Question Type	Legislative
Question:			
Is scavenging being prevente	d?		
Legislative Requirement	EPA 27 (1); EPA O. Reg. 232/98 23;		
Observation			
Yes In accordance with section 11(19) of the EPA, scavenging is not permitted at the site.			

Question ID	NOL 49	Question Type	Information
Question:			
Has a closure plan been submitted to the MECP?			
Legislative Requirement	Not Applicable		
Observation			

No

Condition 34 of the ECA requires that two (2) years prior to the site reaching its final capacity, the Township shall submit to the Director, for approval, a plan for closure, post closure monitoring and maintenance of the site. The plan shall include but not be limited to the final contours of the site, completion, inspection and maintenance of the final cover, an assessment of the adequacy of the monitoring and contingency plans and any other post closure monitoring and care.

The 2021 Annual Report states that the remaining operating life of the site is 4,400 cubic meters or five (5) years. At time of the inspection, Township staff stated that the site only has two (2) years of operating capacity left not five (5) years.



Compliance actions are addressed in different section of this inspection report.

Question ID	NOL 51	Question Type	Legislative
Question:			
Is the landfill only accepting the	ne types of waste that t	hey are approved t	to receive?
Legislative Requirement	EPA 27 (1);		
Observation			
Yes In accordance Condition 16(a and leaf and yard waste.) of the ECA, the site c	nly accepts C&D w	vaste, bulky waste,
Condition 16(b) of the ECA states that the site may receive non-hazardous solid domestic waste from within the Township of Greater Madawaska, on a temporary basis, only with prior written authorization from the District Manager. Condition 16(c) of the ECA requires that prior notification of 48-hours must be provided to the District Manager for receipt of any domestic waste.			
A file review did not show any notifications to the District Manager were received at the Ottawa District Office in the last two years. The 2021 Annual Report states that in 2021, the site was only used to stockpile C&D and bulky waste for processing and disposal. No recycling operations were conducted at the site. It noted that a significant quantity of bentonite clay material from a nearby construction project was received at the site and it was emplaced at the site as final cover and as regular cover in areas of the approved waste disposal area			
The Township shall ensure that before accepting non-hazardous waste at the site, notification is provided to the District Manager as outlined in the ECA.			
Question ID	NOL 55	Question Type	L egislative
Question:			
Does the landfill have emergency contingency plan as required by the ECA?			
Legislative Requirement EPA 27 (1);			
Observation			
Yes Condition 25 of the ECA requires the Township shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation at			

this site. All spills and upsets shall be immediately reported to the Ottawa District Office or the Ministry's Spills Action Centre at 416-325-3000 or 1-800-268-6060, and the



Municipality, and shall be recorded in a log book as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences.

At time of the inspection, Township staff stated that there had been no spills, fires or emergencies in the last two years.

Question ID	NOL 56	Question Type	Information
Question:			
Is there an ECA condition requiring financial assurance?			
Legislative Requirement	Not Applicable		
Observation			
No Financial assurance is not required for municipally operated waste disposal/transfer sites.			

Question ID	NOL 59	Question Type	Legislative
Question:			
Does the landfill have a procedure in place to address complaints?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes As per Condition 24(b) of the ECA, any complaints received from the public or adjacent neighbours shall be recorded in a logbook created and maintained for this purpose. The 2021 Annual Report states that there were no complaints received at the site in 2021. At			

time of the inspection, Township staff stated that there were no complaints received in

Question ID	NOL 61	Question Type	Information
Question:			
Has the landfill operator developed a Design and Operations Manual?			
Legislative Requirement	EPA 27 (1);		
Observation			
Yes			

2022.



Question ID	NOL 63	Question Type	Legislative
Question:			
Does the landfill operator hav	e training procedures f	or site personnel?	
Legislative Requirement	EPA 27 (1);		
Observation			
Yes There are no requirements for waste operations training was conducted in 2021.	r training outlined in EC conducted by Greenv	CA. The 2021 Annu iew on June 12, 20	al Report states that 17. No training was
At time of the inspection, Tow of the year, and the training w	nship staff stated that to vould be documented in	training was planne n the 2022 Annual I	ed for before the end Report.
Question ID	949100	Question Type	Legislative
Question:			
Were the inspection question	s sufficient to address of	other identified non	-compliance items?
Legislative Requirement	Not Applicable		
Observation			
The following instances of nor	n-compliance were also	o noted during the	inspection:
At time of the inspection, Township staff stated that the site likely has an operational capacity of only two (2) years instead of five (5) years as stated in the 2021 Annual Report. This would require the submission of a Closure Plan as outlined in Condition 34 of the ECA. Furthermore, staff stated that some areas of the landfill have exceeded their contours by an estimated 2.4 metres which may further reduce the operational capacity of the landfill. Township staff stated that the Township is exploring submitting an expansion request to extend the life of the site that would also increase the final contours of the landfill to accommodate areas where final contours have been exceeded.			
ACTION			
 The Township shall conduct an assessment of the approved waste disposal area to determine the accurate remaining capacity of the site. The Township shall submit to the Ministry a drawing of the landfilling area that shows the areas that have been overfilled in relation to the approved final contours. The Township shall submit to the Ministry an action plan to address how the site will be brought back into compliance in relations to the approved landfill design and capacity limits. 			



Jp2g No. 22-6213A

October 25, 2022

Ministry of the Environment, Conservation and Parks 2430 Don Reid Drive Ottawa, ON K1H 1E1

- Attention: Thandeka Ponalo Sr. Environmental Officer
- Re: Black Donald Landfill Site Township of Greater Madawaska ECA No. A411902 Expansion Feasibility Study

Dear Thandeka:

On behalf of the Township of Greater Madawaska, we are pleased to provide this feasibility assessment regarding the potential for an expansion at the Black Donald Landfill Site. This report provides the preliminary steps to obtain approval for an expansion and is intended to provide the Township with a foundation for waste management decision making pending Ministry comments.

1.0 INTRODUCTION

The Black Donald Landfill Site located on part of Lot 9, Concession 2 and 3, geographic Township of Brougham in the Township of Greater Madawaska, Ontario, currently operates under ECA No. A411902 issued March 27, 1980, as amended which is included in **Attachment 1**. The following provides the additional Notices issued under the ECA:

Notice No. 1 October 22, 2001	Amended to reflect the increase in site service area to include the Township of Greater Madawaska.
Notice No. 2 July 12, 2002	Amendment to include the submission of the development and operations report as per Condition 14.
Notice No. 3 January 24, 2013	Amended to reflect site operations, approval of alternate daily cover and Site Trigger and Contingency Plan.

The environmental monitoring compliance program is based on the ECA Schedule "B" dated January 24, 2013. Operations compliance is based on a Design, Operations and Development Plan by Greenview Environmental Management, dated December 22, 2010 (Greenview, 2010).



Ottawa 1150 Morrison Dr., #410 Ottawa, ON, K2H 8S9 T: 613-828-7800 Ottawa@jp2g.com Pembroke 12 International Dr. Pembroke, ON, K8A 6W5 T: 613-735-2507 Pembroke@jp2g.com **Arnprior** 16 Edward St. S., #53B Arnprior, ON, K7S 3W4 T: 613-828-7800 Arnprior@jp2g.com



2.0 LANDFILLING CAPACITY

The following has been compiled from various sources to estimate the total approved waste disposal volume and the remaining landfilling capacity. Recent Greenview documents have stated the current volume in place is unknown.

2.1 Total Design Capacity

Under ECA Notice No. 2 dated July 12, 2002 the Site Development And Operations Plan by Jp2g Consultants Inc. dated January 2001 (Jp2g, 2001) as item 4 in Schedule "A" provided the following site capacity figures:

- theoretical maximum capacity of a 1.2 ha site to a pyramidal peak 54,200m³
- preliminary design capacity of a 0.9 ha landfilling area with a 30m buffer along the Township road 25,550m³
- detailed design capacity of 34,250m³ (excluding final cover) with a remaining capacity of 29,350m³ as of January 1, 2001
- the total landfilled in place volume was approximately 4900m³ as of January 1, 2001

The ECA Condition (18) dated July 12, 2002 stated the total capacity including final cover is 46,785m³

2.2 Remaining Capacity

The Preliminary Landfill Expansion Feasibility Studies prepared by Greenview dated August 31, 2007 (Greenview, 2007) cited two (2) remaining capacities.

- As of October 27, 2006 (Golder, 2007) there was an estimated 22,300m³, excluding final cover, remaining capacity.
- Using the revised final contours to accommodate the proposed waste transfer station as presented in the proposed 2007 application to amend the ECA, the remaining capacity was approximately 8,400m³.

The latter was not implemented, as the Black Donald Site was not selected as one of the waste transfer sites.

Under ECA Notice No. 3 dated January 13, 2013 the Design, Operations And Development Plan (Greenview, 2010) as item 7 in Schedule "A" provided the following remaining capacity figures:

- remaining capacity as of October 20, 2009 is 14,926m³
- remaining capacity as of November 2, 2010 is 12,442m³

As of December 14, 2021 the remaining capacity was 4400m³ (Greenview, 2022). The life expectancy could be 2 to 5 years depending on the annual landfilling rate. Based on the annual surveys completed to determine the annual landfilling rate and remaining capacity, the following summarizes the results based on available reports in the Township records.



Year	Annual	Remaining	Estimated Years	Waste Summary
	Landfilled (m3)	Capacity (m3)		
2009	4909	14,926	3	2393 cars 2494 trucks 1145 trailers 27 single axle 11 tandem 16 tri-axle
2010	2484	12,442	5	690 cars 505 trucks 67 trailers 4 single axle 3 tandem 4 tri-axle
2011	11,341			
2012	1087 with cover	10,337	9	33 tri-axles 1 trailer
2013	1197	9140	7.6	28 tri-axles 4 trailers
2014				
2015	256	9320	9	12 tri-axles 1 bin
2016	382	8937	10	3 bins 510m ³
2017				
2018				
2019				
2020	759	6478	12	25 tri-axles 2 bins 410m ³
2021	2078	4400	5	52 tri-axles 786m ³

3.0 LEGISLATIVE REQUIREMENTS

Under Ontario Regulation 101/07, made under the EA Act, a proponent may increase the capacity by 40,000m³ or more but not more than 100,000m³ subject to fulfilling the Environmental Screening Process (ESP). A change of less than 40,000m³ is exempt from the EA Act.

Approvals for changes to waste disposal sites is obtained under Part V of the Environmental Protection Act (EPA) and reviewed under the Environmental Compliance Approval (ECA) process. Under the Ministry's Requirement for Fees with ECA's (formerly O.Reg 363/98 Section 27 EPA) the province applies fees to review applications.

The July 2020 amendments to the EA Act are proposing changes to O.Reg 101/07 under a new regulation, but not to the above approvals process.



To include the approved total waste disposal volume of 46,785m³ which includes final cover (Note O.Reg 232/98 defines total waste disposal volume without final cover) by <100,000m³ the ESP is intended to identify potential environmental effects, concerns and/or issues to be addressed through a phased investigation and consultation process.

Greenview (2007) completed a preliminary landfill expansion feasibility study which included a review of natural heritage features, cultural heritage features and physical environmental features. The report included an Initial Environmental Impact Study by Snider's Ecological Services to assess significant natural features including threatened and endangered species habitat. Additional studies were recommended. The report also included a Stage 1 Archaeological and Cultural Heritage Assessment by The Central Archaeological Group for C.R. Murphy Archaeology. It was determined the potential for significant archaeological sites was low. The scope of work to support an ESP would be much more extensive and requires agency review and comment. In our experience an ESP would cost in the order of \$100,000 to \$200,000 and take approximately 5 years to complete. This cost range depends on the requirements to enhance the current landfill site monitoring program. The Greenview report identified topographical constraints which will limit the expansion of the current landfilling area south and east while maintaining the existing buffers from the Hydro Transmission line and Hydro Dam Road. An expansion to increase the total waste disposal volume by <40,000m³ maybe acceptable as shown on **Drawing No 1**.

To determine the feasibility of expansion <40,000m³, pre-submission consultation with the MECP Ottawa District Office and MECP Technical Support Section (TSS) Regional Office is required prior to the application. This letter combined with the recent Annual Report is anticipated to facilitate this review.

4.0 BLACK DONALD LANDFILL SITE ASSESSMENT

In order to assess the feasibility of a successful expansion application three (3) main issues need to be considered in consultation with the Ministry.

<u>Legal</u> – the status of the ECA, the adequacy of the landholdings and the municipality's compliance with the conditions.

- correct description of the site defining the landfilling area and total site
- correct legal survey or description of the site
- adequate contaminant attenuation zone (CAZ)
- outstanding ECA conditions to be satisfied
- submissions to satisfy a condition requiring Ministry review and approval

<u>Environmental</u> – the status of the water quality and landfill gas monitoring program and any measured or potential impacts on the surface and groundwater, and the potential impact to other natural environmental features.

- groundwater quality impacts
- surface water quality impacts
- adequacy of surface water flow control/stormwater management
- adequacy of the landfill gas monitoring program
- proximity to environmentally sensitive areas (ESA)
- potential impact on rare or endangered species and habitat (SAR)
- outstanding actions to address any Ministry Technical Support Section (TSS) review comments



<u>Operations</u> – the status of site operations and the potential impact on adjacent land uses and the local community.

- any record of negative effects on-site or on adjacent land uses, i.e. litter, dust, noise, odour, landfill gas
- any record of operational concerns
- outstanding actions to address Ministry inspection reports
- outstanding ECA Conditions to be satisfied

4.1 Legal

The ECA No. A411902 last amended January 24, 2013 describes the Site as a 1.2 hectare waste disposal site. ECA Section (2) 2.12 defines the Site as 'the entire waste disposal site including the landfilling area and the buffer lands as listed in Schedule "A" of the Certificate and consisting of approximately 1.2 hectare landfill site'. Upon review of the documents in Schedule "A" the Site comprises a 0.9m landfilling area within a total site area of 27.2 ha.

ECA Condition (33) required that a Certificate of Prohibition be registered on title. Based on available records it was registered on lands located in Part of Lot 9, Concession 2 and 3, Brougham, being Parts 1 to 4 Plan 49R-15646. As detailed in Section 4.2 the current operation has an adequate CAZ which should be satisfactory for a modest sized expansion. In Section 4.2 and 4.3 it is noted there are no ECA Conditions outstanding regarding environmental monitoring or site operations respectively.

4.2 Environmental

The monitoring program approved under the current ECA is to satisfy Condition 27. The monitoring program as detailed in ECA Schedule "B" consists of the bi-annual collection of static water levels and groundwater samples from seven (7) monitoring wells, and surface water samples collected three times per year from four (4) locations. The following provides an overview of the Environmental Monitoring program based on the work activities and laboratory data from the 2021 Monitoring period.

<u>Overview</u>

For the purpose of this submission, we have included the figures from the 2021 Annual Report by Greenview (2022) in **Attachment 2** and Borehole Logs in **Attachment 3**. The groundwater configuration at the site in 2021 was consistent with historical interpretations with an east-west oriented groundwater divide evident in the vicinity of the waste mound, and predominant groundwater flow directions to the east, west, and southeast as shown on Figures 4 and 5 in **Attachment 2**. Additionally, groundwater in the vicinity of the monitoring well MW08-6 was interpreted to flow to the east.

Groundwater immediately downgradient from the site at monitoring wells BH1, BH3, and BH4 was interpreted to be impacted from landfill-related activities in 2021. Most parameter concentrations were above median background groundwater quality results, with non-conformances of ODWS for concentrations of alkalinity, DOC, hardness, iron, manganese, and TDS noted at select monitors. The generally lower parameter concentrations at monitoring well BH3 compared to those at monitoring wells BH1 and BH4 were attributed to its location partially cross-gradient to the waste mound and along the groundwater divide at the site. Results from monitoring well BH1 were interpreted to be most representative of leachate quality at the Black Donald site at this time.



No RUC non-conformances were documented in results from downgradient monitoring well MW08-7 in 2021 that were attributed to landfill-related factors. The noted RUC non-conformance in fall 2021 at MW08-7 for DOC was consistent with DOC concentrations observed in background wells BH2 and MW08-6. Based on the above, the Black Donald site was interpreted to meet the intent of MECP Guideline B-7 at the downgradient eastern CAZ boundary in 2021. Based on 2021 results, it was extrapolated that given the considerable distance of BH4 to the downgradient southwestern CAZ boundary (approximately 170 m), and naturally-occurring concentrations of alkalinity, aluminum, DOC, hardness, manganese, and TDS in the background (BH2 and MW08-6), the Black Donald site was interpreted to meet the intent of MECP Guideline B-7 and was interpreted to be in compliance with RUC in 2021 at the southwestern CAZ boundary.

Based on the surface water quality results in 2021, and the significant distance of each sampling location from the Black Donald site, the surface water systems south and southeast of the Black Donald site were not interpreted to be impacted from landfill-related activities. Non-conformances of PWQO for concentrations of DO (low), phosphorus, iron and zinc noted in 2021 at select sampling locations for select sampling dates were attributed to naturally occurring conditions in the background (SW-4), as well as to low-flow surface water conditions.

In 2021, PWQO non-conformances at key trigger locations SW-3 and SW-6 for concentrations of iron were attributed to low water/ low-flow conditions, and not to landfill-related activities. Similarly, PWQO non-conformances for concentrations of phosphorus at key trigger location SW-3 were generally consistent with concentrations observed at background location SW-4 and were therefore not attributed to landfill-related factors. No RUC non-conformances were noted for any of the key trigger parameters at key trigger location MW08-7 following inclusion of 2021 results. Based on a review of five (5) year time trend analysis for parameters un-ionized ammonia, barium, boron, chloride, chromium, COD, iron, nitrate, sodium, sulphate, TKN and total phosphorus, the Trigger Mechanism was not interpreted to be activated in 2021.

Part of the feasibility study for the landfill expansion has included a critical review of the monitoring program including:

- enhancement of the groundwater quality sampling with the potential for further delineation of the leachate plume in the overburden and bedrock aquifers
- modify the surface water program by enhancing the sampling and review locations at a significant distance from the fill area

It is anticipated that a proposed expansion will not impact Environmentally Sensitive Areas (ESA) or Species At Risk (SAR), or their habitat as the expansion of the landfilling area is immediately adjacent to the operating fill area.

Revised Groundwater Monitoring Program

The existing monitoring program was reviewed to assess groundwater and quality and locations, and where feasible bolster the program to accurately address necessary impacts from the landfill. **Attachment 4** indicates the existing, and proposed revision of the monitoring program. As shown, monitoring wells are to be sampled on an annual basis for the full set of parameters as per Schedule 5 Column 1 of the Landfill Standards (1998). This increase in parameters will help establish a more comprehensive data set for the boundary compliance wells, to compare with the background and leachate wells.



The updated program will continue to sample the monitoring wells as per ECA Schedule "B", with the proposed addition of the following as shown on **Drawing No 2** (a Greenview base plan)

- one (1) bi-level monitoring well within the overburden (if available) and bedrock aquifers east of the landfilling area to further delineate the plume within the groundwater towards MW08-7;
- compliance well MW08-7 is installed in the overburden (sand material), see borehole log in Attachment 3, therefore it is recommended to also install a bedrock monitoring well in this location to delineate leachate in the bedrock aquifer in this direction; and
- monitoring well BH3 was destroyed in 2021 due to landfilling activities; this well should be reinstated to aid in assessing leachate migration south of the fill area.

The water quality analysis to be expanded to Schedule 5 Column 1 of the Landfill Standards (1988). Upon installation and sampling it is further recommended to update the trigger mechanism and contingency plan to reflect a proposed expansion.

Revised Surface Water Monitoring Program

The original program included surface water monitoring locations SW-1, SW-2, SW-4, SW-4, SW-5 and SW-7. SW-4 was relocated and represents background surface water quality at the site. In 2009 the Ministry agreed to remove SW-1, SW-2 and SW-7 from the monitoring program as they were typically observed to be dry. In the 2015 Annual Report the Township requested that surface water sampling be deleted from the monitoring program. The MECP letter dated July 7, 2016 reiterated that it should continue. Locations SW-3 and SW-6 are located a significant distance from the landfilling area as shown on **Figure 3** in **Attachment 2** and could be removed from the program.

Upon completion of a more detailed topographic survey and review of surface water drainage from the expanded landfilling area, additional sampling locations may be considered. The proposed analysis is to be expanded to Schedule 5 Column 3 of the Landfill Standards (1998).

To establish a more comprehensive water quality data base, in accordance with ECA Condition 28 we request District Manager approval to alter the groundwater and surface water monitoring program as shown in **Attachment 4**.

4.3 Operational

Landfilling at the Black Donald WDS initially involved a trench, burn and cover operation in the 1970s. Based on a test pit program conducted in 1998 a landfilling area of approximately 0.4ha was identified within the 1.2 ha site and an estimated in place waste volume of 4400m³. A copy of the plan is included in **Attachment 5**. The base elevations were developed from an assumed elevation.

At the time of the 2001 application to amend the Certificate an estimated in place volume of 4900m³ was stated. The Site Development and Operations Plan, January 2001 presented a design with final contours providing a remaining capacity of 34,250 m³ excluding final cover. A copy of the 2001 design drawings are included in **Attachment 5**.



Landfilling operations included an area method of landfilling over the former waste disposal area and towards Hydro Dam Road within the limits of a 0.9 ha landfilling area which applied a 30m buffer from Hydro Dam Road and a 15m buffer from the Hydro One easement limit.

On April 5, 2010 the Black Donald site was closed to the public for waste and recycling operations. The Greenview Design, Operations and Development Plan, December 2010 design utilized the Jp2g concept and detailed a five (5) staged approach for landfilling. A copy of the 2010 Stage 5 drawing up to final contours without final cover is included in **Attachment 5**.

Landfilling Operations

The Greenview 2010 report details the current landfilling procedures. The site is approved to receive leaf and yard waste, bulky and construction & demolition (C&D) waste from municipal vehicles and Township approved haulers only, under the supervision of Township staff. The bulky and C&D waste is stockpiled on the active landfilling area and is ground by a licensed contractor for use as an alternative cover material source as per ECA Conditions 16(a) and 35(a) and (b). ECA Conditions 16(b) and (c) permit the Site to receive non-hazardous solid domestic waste on a temporary basis, i.e. in the event waste from the transfer stations cannot be received elsewhere.

Waste Diversion

There is no curb side collection of household waste and recyclables in the Township unless contracted directly by a homeowner or business. Currently waste received at the three (3) waste transfer sites are hauled to Moose Creek for disposal. Blue box recyclables are transferred to Emterra in Renfrew, cardboard is hauled to OVWRC near Pembroke. Other recyclable materials are picked up be licenced haulers. Household hazardous waste is accepted at the Renfrew Landfill Site facility.

ECA Operations Review

All waste deliveries to the Site are inspected by trained municipal employees and records maintained of the waste disposal operations. The following ECA conditions are being satisfied.

- 15 (a) The Owner shall develop the Site in accordance with the Site Design, Operations and Development Plan, dated December 22, 2010, item 7 of Schedule "A".
 - (b) The Site shall be constructed, operated and maintained in an environmentally safe manner, which minimizes the impacts of dust, odour, noise, litter, vector and vermin on the general public, Site personnel, and the natural environment.
- All incoming waste shall be inspected prior to being received at the Site to ensure that the Site is approved to accept such a waste.
- 21 The Owner shall ensure that all wastes at the Site are managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.
- 22 The Owner shall maintain records of the results of all inspections and monitoring and a summary of all activities associated with the Site (e.g., spills, maintenance work) in a record book located at the Site.



- 23 The Owner shall conduct weekly inspections of the equipment and facilities at the Site to ensure that they are maintained in good working condition at all times. Any deficiencies, which might negatively impact the environment, detected during these inspections shall be recorded in a log, and promptly corrected.
- 24 (a) A sign shall be posted in a prominent location at the entrance at the Site stating the hours of operation, the Owner's name, staff contact and telephone to all in the event of an emergency or any complaints.
 - (b) Complaints received from the public or adjacent neighbours shall be recorded in a logbook created and maintained for this purpose.
- 25 (a) The Owner shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation at this Site.
 - (b) All spills and upsets shall be immediately reported to the Ottawa District Office or the Ministry's Spills Action Centre at 416.325.300 or 1.800.268.6060, and the Municipality, and shall be recorded in a logbook as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences.
 - (c) All waste material from a spill or process upset, shall be managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.
- 35 (a) The Owner shall ensure that only Ministry-approved contractors carry out the processing of the Construction and Demolition and Bulky Waste at the Site.
 - (b) The Owner shall ensure that Construction and Demolition and Bulky Waste is stored and processing within the landfill footprint, as shown in Figure 6, Proposed Site Design, of item 7 of Schedule "A".
- 36 (a) The Owner shall ensure that leaf and yard storage and composting is conducted as described in the Site Design, Operations and Development Plan, item 7 of Schedule "A".
 - (b) A maximum of 1000 cubic meters of leaf and yard waste may be temporarily stored within the staging area.
 - (c) Leaf and yard wastes shall be moved to the established composting area within the three months of arrival at the Site.
 - (d) A maximum of 500 cubic meters of leaf and yard may be processed within the composting area at any time.
- 37 (a) The Owner shall ensure that cover material is applied at the Site as follows:
 - Intermediate Once every six (6) months, across the entire working face, and/or in areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 0.3 meters of soil or an approved thickness of alternative cover material shall be placed.
 - Final In areas where landfilling has been completed to final contours, a minimum of 0.6 meters thick layer of final cover soil shall be placed, followed by a 0.15 meter of topsoil.



- (b) In the event that domestic waste is received at the Site on a temporary basis, daily cover shall be applied, at the end of each working day, followed by 0.15 meters of soil.
- (c) The Owner may apply the following materials as alternative intermediate cover, in the same thicknesses as described in Condition 37(a):
 - leaf and yard waste mixed with soil cover and/or wood chips
 - composted or partially-composted leaf and yard waste
 - asphalt shingles
 - clean wood chips
 - contaminated soil, non-hazardous
 - processed C&D and bulky waste materials

Ministry Site Inspections

-

_

According to Township records a site inspection was completed May 26, 2015. A site inspection report dated July 6, 2015 requested the following:

- 1. Weekly inspections as per Condition 23 of the ECA.
- 2. Records of inspections as per Condition 22 of the ECA
- 3. Signage to be improved as per Condition 24(a) of the ECA
- 4. Access by unauthorized person is prevented by better fencing as per Section 11(6) of the O.Reg 347 of the EPA.

In reference to the 2021 Annual Report (Greenview, 2022) the Township received a site inspection report dated October 9, 2019. The report includes the following action items:

- 1. Township shall begin keeping weekly record of the equipment and facilities at the Site as per Condition 23 of the ECA
- 2. Recommend posting a No Dumping sign at the entrance and take further steps to prevent dumping as required by Section 11(16) of O.Reg 347

An Action Plan was filed by Greenview dated November 25, 2019. The Township submitted photos of the signage on February 14, 2020.

Jp2g Site Review

Jp2g conducted a site inspection on September 16 and 29, 2022 to review current operations and assess the feasibility of an expansion to the landfilling area. All signage was in good condition and the gate was locked. The access road to the fill area was in satisfactory condition. A large stockpile of unprocessed bulky and C&D waste was deposited on the waste mound, the ground waste has been spread and there was little wind-blown litter. Areas of the waste mound had received earth/granular material final cover and some slopes were fairly steep. Overall, the waste mound needed re-grading to achieve the 4:1 side slopes and final contours where landfilling was completed.



5.0 EXPANSION PROPOSAL

The existing landfilling area is located on a topographic bedrock high with slopes southeast and east. Overburden is characterized by a fine to medium sand of approximately 0.3 to 1.5m in thickness with local bedrock outcropping near the fill area. MW08-7 located to the east on the opposite side of Hydro Dam Road has over 8m of overburden thickness.

Based on groundwater elevation measurements over the past 20 years there is a shallow groundwater flow to the east, west and southwest which is generally consistent with the slope of the ground topography.

MW08-6 is considered the background well installed on Crown Land on the opposite side of the Hydro transmission line. BH1 is located approximately 25m east and downgradient of the fill area and the water quality is characterized by elevated concentrations of landfill leachate parameters. Given the proximity to Hydro Dam Road, road salting may also be a factor.

A RUC assessment was completed at MW08-7 which is located to the southeast of the fill area and 180m southeast of BH1 at the easterly limit of the CAZ. No RUC exceedances were documented, as the elevated DOC concentration was also detected in the background well.

In support of the proposed expansion, we propose the installation of additional overburden and bedrock monitoring wells. Water quality analysis to be expanded to Schedule 5 Column 1 of the Landfill Standards. We propose to maintain the current surface water sampling locations SW-4 (background) and SW-5 and expand the analysis to include the parameters in Schedule 5 Column 3 of the Landfill Standards. Upon further detailed topographic survey of the expansion area additional locations may be identified.

Due to the Hydro transmission line and Hydro Dam Road the expansion of the fill area is limited to the south and southeast. **Drawing No. 1** illustrates a conceptual expansion which could add another 30,000 to <40,000m³ of waste disposal capacity. The final design requirements for the proposed expansion will require additional field elevation survey.



We trust this summary is satisfactory and will be considered by the Ottawa District Office and TSS in their review of the latest Annual Report. Should you have any questions please do not hesitate to contact the undersigned.

Yours very truly, Jp2g Consultants Inc. Engineers • Planners • Project Managers

Kevin Mooder, MCIP, RPP Principal I Environmental Services

Andrea Sare, C.Tech, EP. Environmental Consultant

Halren Bopp

Andrew Buzza, P.Geo Sr. Hydrogeologist

KM/AS/AB/jlp

cc Leonard Emon Facilities Manager

Drawings





Black Donald - Greater Madawaska

12 INTERNATIONAL DRIVE, PEMBROKE, ON Phone: (613)735-2507, Fax:(613)735-4513 1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON Phone: (613)828-7800, Fax: (613)828-2600

Expansion design and designed Phase 5

DWG NAME: J:(6-ENVIRONMENTAL\ACTIVE\2022\22-6213A - GREATER MADAWASKA WDS\DRAWINGS\BLACK DONALD\CAD FILES\EXPANSION 2022 FEASIBLE.DWG LAYOUT: PHASE 5 + EXPANSIONS SAVED ON October 21, 2022

		1-1 000		
	0 10 	20 30 1:1	40 50 m	
DRAFTED: QS		PROJECT No.:	22-6213A	
CHECKED: KM		REVISION DATE:	2022-10-11	
CHECKED: KM	APPROVED: KM	REVISION No.:		
SCALE: 1:1000		SHEET No.:	1 of 1	



Attachment 1 ECA

Ontario

Ministry of the Environment Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A411902 Notice No. 3 Issue Date: January 24, 2013

The Corporation of the Township of Greater Madawaska 1101 Francis St Post Office Box, No. 180 Greater Madawaska, Ontario K0J 1H0



Site Location: Black Donald Waste Disposal Site 34 Hydro Dam Rd Greater Madawaska Township, County of Renfrew

You are hereby notified that I have amended Approval No. A411902 issued on March 27, 1980, and amended on October 12, 2001 and July 12, 2002 for the use and operation of a 1.2 hectare waste disposal site, as follows:

This Notice of Amendment updates the Approval to reflect current site operations, approves alternative daily cover and the Site Trigger and Contingency Plan.

The following definitions are added:

"Approval" means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A".

"Construction and Demolition and Bulky Waste" or "C&D waste" means wastes resulting from construction, and includes the following: asphalt shingles, mattresses, furniture, carpet, tree stumps, drywall, wallboard, wood (painted and unpainted).

The following Conditions are revoked and replaced:

- (15) (a) The Owner shall develop the Site in accordance with the Site Design, Operations and Development Plan, dated December 22, 2010, item 7 of Schedule "A".
 - (b) The Site shall be constructed, operated and maintained in an environmentally safe manner, which minimizes the impacts of dust, odour, noise, litter, vector and vermin on the general public, Site

Page 1 - NUMBER A411902

personnel, and the natural environment.

- (16) (a) The Site shall only receive only non-hazardous solid Construction and Demolition and Bulky Waste, and leaf and yard waste, generated from within the Township of Greater Madawaska.
 - (b) The Site may receive non-hazardous solid domestic waste from within the Township of Greater Madawaska, on a temporary basis, only with prior written authorization from the District Manager.
 - (c) Prior notification of 48-hours must be provided to the District Manager for receipt of any domestic waste.
- (23) The Owner shall conduct weekly inspections of the equipment and facilities at the Site to ensure that they are maintained in good working condition at all times. Any deficiencies, which might negatively impact the environment, which are detected during these inspections shall be recorded in a log, and promptly corrected.
- (26) The Owner shall implement the Site surfacewater and groundwater monitoring program as described in Schedule "B" of this Approval.

Site Trigger and Contingency Plan

(29) The Owner shall establish the surfacewater and groundwater trigger and contingency plan, as described in Section 6.2 of the Design, Development and Operations Plan, item 7 of Schedule "A".

The following Conditions are added:

Waste Processing

- (35) (a) The Owner shall ensure that only Ministry-approved contractors carry out the processing of the Construction and Demolition and Bulky Waste at the Site.
 - (b) The Owner shall ensure that Construction and Demolition and Bulky Waste is stored and processed within the landfill footprint, as shown in Figure 6, Proposed Site Design, of item 7 of Schedule "A".

Leaf and Yard

- (36) (a) The Owner shall ensure that leaf and yard storage and composting is conducted as described in the Site Design, Operations and Development Plan, item 7 of Schedule "A".
 - (b) A maximum of 1000 cubic metres of leaf and yard waste may be temporarily stored within the staging area.
 - (c) Leaf and yard wastes shall be moved to the established composting area within three months of arrival

Page 2 - NUMBER A411902

at the Site.

- (d) A maximum of 500 cubic metres of leaf and yard waste may be processed within the composting area at any time.
- (d) Composted leaf and yard waste may only be used as alternative daily cover at the Site, it may not be re-used by the public.

Cover

- (37)(a) The Owner shall ensure that cover material is applied at the Site as follows:
- Intermediate Once every six (6) months, across the entire working face, and/or in areas where landfilling
 has been temporarily discontinued for six (6) months or more, a minimum thickness of 0.3 metre of soil or
 an approved thickness of alternative cover material shall be placed; and
- Final -In areas where landfilling has been completed to final contours, a minimum of 0.6 metre thick layer of final cover soil shall be placed, followed by 0.15 metre of topsoil.
 - (b) In the event that domestic waste is received at the Site on a temporary basis, daily cover shall be applied, at the end of each working day, consisting of a minimum of 0.15 m of soil.

Alternative Daily Cover

- (c) The Owner may apply the following materials as alternative intermediate cover, in the same thicknesses as described in Condition 37 (a):
 - leaf and yard waste mixed with soil cover and/or wood chips;
 - composted or partially-composted leaf and yard waste;
 - asphalt shingles;
 - clean wood chips;
 - contaminated soil non-hazardous;
 - processed C&D and bulky waste materials.

Page 3 - NUMBER A411902

Schedule "A"

The following items are added to Schedule "A".

- Report entitled "Design, Operations and Development Plan, Black Donald Waste Disposal Site (A411902), Township of Greater Madawaska, County of Renfrew, Ontario", prepared by Greenview Environmental Management Limited, dated December 22, 2010.
- Letter dated July 30, 2012, from Dan Hagan, Greenview Environmental Management, to Lynda Mulcahy, MOE, RE: Application for Approval of Waste Disposal Sites, Black Donald Waste Disposal Site (A411902), Township of Greater Madawaska, County of Renfrew, MOE reference number: 3866-CTJ5V, with responses to waste review comments and questions.
- e-mail from Dan Hagan, Greenview Environmental Management Limited, to Lynda Mulcahy, MOE, sent August 22, 2012, 9:57am, Subject: RE TGM - Black Donald WDS - Application for Approval of Waste Disposal Sites - MOE Request for Additional Information (MOE Reference Number: 3866-8CTJ5V)

Schedule "B" is added to the Approval

Site Groundwater and Surfacewater Monitoring Program

Location	Frequency	Parameters
<u>Groundwater</u> BH1, BH2, BH3, BH4, MW08-5, MW08-6, MW08-7 I QA/QC	Twice per year (Spring, Fall)	Alkalinity, aluminum, ammonia, barium, boron, cadmium, calcium, chromium, cobalt, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, phenols, potassium, silicon, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc field measurements (pH, conductivity, temperature), water levels
BH1	Once every 5 years (Spring)	VOCs - EPA 624
<u>Surface Water</u> SW-3, SW-4, SW-5, SW-6 1 QA/QC	Three Times (Spring, Summer, Fall)	Alkalinity, ammonia, BOD, boron, cadmium, calcium, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, nitrite, phenols, potassium, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc, TSS Field Measurements (pH, conductivity, dissolved oxygen, temperature, unionized ammonia (calculation))

Page 5 - NUMBER A411902

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

Condition 15 was revised to reflect the updated Design, Operations and Development plan for the Site, and to ensure the Site does not cause nuisance or impacts.

Condition 16 was revised to clarify the currently-approved wastes that may be received at the Site.

Condition 23 was revised to update the Site inspection requirement.

Condition 26 was revised to reflect the updated Site monitoring programs.

Condition 29 was added to approve the Site trigger and contingency plan.

Condition 35 is added to ensure that storage and processing of construction and demolition wastes are carried out as described in the updated Design, Operations and Development plan, and are carried out in an environmentally-safe manner.

Condition 36 is added to ensure that leaf and yard waste storage and composting is carried out as described in the updated Design, Operations and Development plan, and are carried out in an environmentally-safe manner.

Condition 37 is included to specify cover requirements for the Site, to ensure operations to not cause impacts or nuisance.

Schedule B was added to the Approval to include the updated Site monitoring program.

This Notice shall constitute part of the approval issued under Approval No. A411902 dated March 27, 1980

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:

- 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;
- 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;
- The address of the appellant;
- 5. The environmental compliance approval number,
- 6. The date of the environmental compliance approval

Page 6 - NUMBER A411902

- 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 <u>AND</u> Toronto, Ontario M5G 1E5 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 24th day of January, 2013

THIS NOTICE WAS MAILED ON 0 C (Signed)

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

LM/ c:

District Manager, MOE Ottawa

Tyler H. Peters, Greenview Environmental Management Limited /

SIREBMC03250

Ontario

Ministry Ministère of the de

of the de Environment l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL WASTE DISPOSAL SITE NUMBER A411902 Notice No. 2

The Corporation of the Township of Greater Madawaska 1101 Francis Street Bagot, Blythfield And Brougham, Ontario K0J 1H0

MINISTRY ENVIRONIA

Site Location Black Donald Waste Disposal Site 34 Hydro Dam Road Greater Madawaska Township, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A411902 issued on March 27, 1980, and amended on October 22, 2001 for submission of development and operations report as per Condition No. (14) of October 22, 2001 amendment, as follows:

Condition No. (14) is hereby revoked.

The following conditions of approval are added to the Provisional Certificate of Approval:

SITE OPERATIONS:

- (15) The Site shall be constructed, operated and maintained in an environmentally safe manner, which minimizes the impacts of dust, odour, noise, litter, vector and vermin on the general public, Site personnel, and the natural environment, all in accordance to the Development and Operations Plan, Items 4, 5 and 6 of Schedule "A".
- (16) The Site shall only receive non-hazardous municipal waste that is generated from within the Township of Greater Madawaska.
- (17) The normal daily hours of operation for receiving waste at the Site are 7 am to 9 pm.
- (18) The total volumetric capacity of the Site, including waste, daily, interim and final cover, is 46,785 cubic meters.
- (19) The Owner shall ensure that there is no burning of waste, trees, brush and or clean wood piles at the Site.
- (20) All incoming waste shall be inspected prior to being received at the Site to ensure that the Site is approved to accept such a waste.

- (21) The Owner shall ensure that all wastes at the Site are managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.
- (22) The Owner shall maintain records of the results of all inspections and monitoring and a summary of all activities associated with the Site (e.g. spills, maintenance work) in a record book located at the Site.
- (23) The Owner shall conduct daily inspections of the equipment and facilities at the Site to ensure that they are maintained in good working condition all the times. Any deficiencies, which might negatively impact the environment, detected during these inspections shall be recorded in a log, and promptly corrected.
- (24) (a) A sign shall be posted in a prominent location at the entrance of the Site stating the hours of operation, the Owner's name, staff contact and telephone number to call in the event of an emergency or any complaints;
 - (b) Complaints received from the public or adjacent neighbours shall be recorded in a log book created and maintained for this purpose.
- (25) (a) The Owner shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation at this Site;
 - (b) All spills and upsets shall be immediately reported to the Ottawa District Office or the Ministry's Spills Action Centre at 416-325-3000 or 1-800-268-6060, and the Municipality, and shall be recorded in a log book as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences; and
 - (c) All waste material resulting from a spill or process upset, shall be managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.

MONITORING AND REPORTING REQUIREMENTS

- (26) Surface and groundwater monitoring shall be conducted in accordance to Section 9.1 and 9.2, Item 4 of Schedule "A" provided that the following conditions are met:
 - (a) Prior to the development of the Site, the Owner shall establish that the seasonal high water table is at least one meter below the proposed excavation bottom;
 - (b) In addition to the parameters listed in Table 2, Section 9.1, Item 4 of Schedule "A", Nitrate and Ammonia shall be included for groundwater monitoring; and
 - (c) The background groundwater monitoring well (BH-1) shall be established further away from the waste pile, and one groundwater monitoring well shall be established at the midway point of the Site's southern boundary.
- (27) By March 31, 2003, and on an annual basis thereafter, the Owner shall submit to the District Manager, an annual report on the development, operation and monitoring of the Site, including any

Page 2 - NUMBER A411902

. 1

recommendations or changes to the annual monitoring program, in accordance to Section 10.1, Item 4 of Schedule "A".

A written approval from the District Manager shall be obtained for any changes to the annual monitoring program prior to these changes being implemented.

(a) In accordance to the Phased Plan outlined in Section 9.1, Item 4 of the Schedule "A", and by March 31, 2003, included in the annual monitoring report, the Owner shall submit to the District Manager for written approval, trigger levels for initiating investigative activities into the cause of an increase in contaminant concentrations as established by the surface and ground water monitoring programs along with appropriate investigative activities and contingency measures;

(b) Within six (6) months from exceedance of the established trigger levels, the Owner shall submit to the Director for approval, the design of appropriate contingency measures and provide detailed plans, specifications and description for the design, operation and maintenance for the appropriate remedial actions; and

(c) The remedial actions shall be implemented within nine months from the approval by the Director.

BUFFER AREA AND CONTAMINANT ATTENUATION ZONE

(28)

(29)

(31)

1

(30) Within 60 days of issuance of this Amendment, the Owner shall arrange for a legal survey of the Site and required buffer area, as specified in Items 4 and 5 of Schedule A, to be conducted by an Ontario Land Surveyor registered under the Surveyors Act.

(a) By June 30, 2003, the Owner shall acquire the lands required for the contaminant attenuation zone in accordance to Figure 2 and Drawing 1, Item 4 of the Schedule "A". Alternatively, the Owner shall propose, by June 30, 2003, to the Director for approval, other methods for bringing the Site into compliance with respect to Guideline B-7, Reasonable Use Criteria and other applicable Ministry Regulations, Guidelines and Policies.

- (b) (i) By June 30, 2003, the Owner shall acquire lands required for the 30 meter southern and western buffer areas in accordance to Drawing 1, Item 4 of the Schedule "A". Alternatively, the Owner shall propose, by June 30, 2003, to the Director for approval, other Site development methods to allow for a 30 meter southern and western buffer within the current Site boundary.
 - (ii) The Owner shall not commence waste disposal activities on the southern and western Site boundary until Condition (31)(b)(i) has been met.
- (c) Within 30 days of purchase of lands noted in Condition (31)(a) and (31)(b), the Owner shall submit to the Director an updated legal survey of these lands for addition of these lands to the Certificate of Approval.

(32) The Owner shall ensure that no wastes are deposited within the designated 15 meter northern buffer area and the 30 meter eastern buffer area after the date of issuance of this Certificate of Approval.

PROHIBITION AND REGISTRATION ON TITLE

(33) Pursuant to Section 197 of the EPA neither the Owner nor any person having an interest in the Site shall deal with the Site in any way without first giving a copy of this Certificate to each person acquiring an interest in the Site as a result of the dealing.

(a) The Owner shall:

(i) Within sixty (60) calendar days of the date of this Certificate, submit to the Director for the Director's signature two (2) copies of a completed Certificate of Prohibition containing a registerable description of the Site, in accordance with Form 1 of O. Reg. 14/92 (Document General- Form 4- Land Registration Reform Act); and

(ii) Within ten (10) calendar days of receiving the Certificate of Prohibition signed by the Director, register the Certificate of Prohibition in the appropriate Land Registry Office on title to the Site and submit to the Director immediately following registration the duplicate registered copy.

SITE CLOSURE

(34) Within 2 years prior to the Site reaching its final capacity specified in this Amendment, the Owner shall submit to the Director, for approval, a plan for closure, post closure monitoring and maintenance of the Site. The plan shall include but not be limited to the final contours of the Site, completion, inspection and maintenance of the final cover, an assessment of the adequacy of the monitoring and contingency plans and any other post closure monitoring and care.

The following items are added to SCHEDULE "A":

 Township of Greater Madawaska, Black Donald Waste Disposal Site, Site Development and Operations Plan, Prepared by Jp2g Consultants Inc. dated January 2001.

5. Letter and accompanying documents dated November 13, 2001, from Brian Whitehead, Jp2g Consultants Inc., addressed to John Kaasalainen, MOE.

6. Letter dated March 13, 2002, from Nafiseh Pourhassani, P. Eng., MOE, addressed to Cathy Reddy, The Corporation of the Township of Greater Madawaska.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A411902 dated March 27, 1980 and amended on October 22, 2001.

Page 4 - NUMBER A411902

In accordance with Section 139 of the <u>Environmental Protection Act</u>, 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 <u>Environmental Protection Act</u>, provides that the Notice requiring the hearing shall state:

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

The Notice should also include:

3. The name of the appellant;

5

1.

2.

The address of the appellant;

5. The Certificate of Approval number;

- 6. The date of the Certificate of Approval;
- The name of the Director;
 The municipality within w
 - The municipality within which the waste disposal site is located;

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

AND

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 2300 Yonge St., 12th Floor P.O. Box 2382 Toronto, Ontario M4P 1E4

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 12th day of July, 2002



NP/

C:

District Manager, MOE Ottawa District Office Andrew Polley, MOE, Ottawa District Office / Bruce Harman, Lakefield Research Ltd.

Ian Parrott, P.Eng. Director Section 39, Environmental Protection Act

of the Ontario

Ministry Ministère of the de Environment l'Environnement AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL WASTE DISPOSAL SITE NUMBER A 411902

Notice No. 1

8%-

Corporation of the Township of Greater Madawaska P.O. Box 180 1101 Francis Street, Calabogie, Ontario K0J 1H0

Site Location: Black Donald Waste Disposal Site Pt. Lot 9, Conc. 3, 34 Hydro Dam Road Geographical Township of Brougham Township of Greater Madawaska, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A 411902 issued on March 27, 1980 for an increase in the site service area to include the Township of Greater Madawaska, as follows:

The following conditions of approval are added to the Provisional Certificate of Approval:

DEFINITIONS

- (2) For the purpose of this Certificate of Approval, unless the contrary intention appears, the following words and phrases shall have the following meaning attributed to them:
 - 2.1 "Adverse Effect" is as defined in the Environmental Protection Act, R.S.O. 1990.
 - 2.2 "Applicant" and/or "Owner" means the Township of Greater Madawaska.
 - 2.3 "Certificate" means the Provisional Certificate of Approval No. A 411902, as amended from time to time, including all schedules attached to and forming part of the Certificate.
 - 2.4 "Crown" means Her Majesty the Queen in Right of Ontario.
 - 2.5 "Director" means the one or more persons who from time to time are so designated for the purpose of Part V of the Environmental Protection Act.
 - 2.6 "District Manager" means the District Manager of the Ministry's Ottawa District Office.
 - 2.7 "EPA" means the Environmental Protection Act, R.S.O. 1990, Chapter E.19, as amended.
 - 2.8 "Ministry" and/or "MOE" means the Ontario Ministry of the Environment.
 - 2.9 "ODWS" means the Ontario Drinking Water Standards, as amended.
 - 2.10 "OWRA" means the Ontario Water Resources Act, R.S.O. 1990, as amended.

2.11 "PWQO" means the Provincial Water Quality Objectives, as amended.

"Site" means the entire waste disposal site including the landfilling area and the buffer lands as listed in Schedule "A" of the Certificate and consisting of approximately a 1.2 hectare landfill site.

"Supporting Documentation" refers to the reports listed in Schedule "A" of the Certificate.

GENERAL

(3)

(4)

(5)

(6)

2.12

2.13

The requirements specified in this Provisional Certificate of Approval are the requirements under the <u>Environmental Protection Act</u>, R.S.O. 1990. The issuance of this Provisional Certificate of Approval in no way abrogates the Applicant's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.

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

The Applicant shall ensure compliance with all the terms and conditions of this Provisional Certificate of Approval. Any non-compliance constitutes a violation of the Environmental Protection Act, R.S.O. 1990 and is grounds for enforcement.

(a) The Applicant shall, forthwith upon request of the Director, District Manager, or Provincial Officer (as defined in the Act), furnish any information requested by such persons with respect to compliance with this Provisional Certificate of Approval, including but not limited to, any records required to be kept under this Provisional Certificate of Approval; and

(b) In the event the Applicant provides the Ministry with information, records, documentation or notification in accordance with this Provisional Certificate of Approval (for the purposes of this condition referred to as "Information"),

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

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

- The Applicant shall allow Ministry personnel, or a Ministry authorized representative(s), upon presentation of credentials, to:
 - (a) carry out any and all inspections authorized by Section 156, 157 or 158 of the <u>Environmental Protection Act</u>, R.S.O. 1990, Section 15, 16 or 17 of the <u>Ontario Water Resources Act</u>, R.S.O. 1990, or Section 19 or 20 of the <u>Pesticides Act</u>, R.S.O. 1990, as amended from time to time, of any place to which this Provisional Certificate of Approval relates; and,

without restricting the generality of the foregoing, to:

- (i) enter upon the premises where the records required by the conditions of this Provisional Certificate of Approval are kept;
 - (ii) have access to and copy, at reasonable times, any records required by the conditions of this Provisional Certificate of Approval;
 - (iii) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the conditions of this Provisional Certificate of Approval; and
 - (iv) sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Provisional Certificate of Approval.
- (a) Where there is a conflict between a provision of any document referred to in Schedule "A", and the conditions of this Provisional Certificate of Approval, the conditions in this Provisional Certificate of Approval shall take precedence; and
- (b) Where there is a conflict between documents listed in Schedule "A", the document bearing the most recent date shall prevail.
- (9) The Applicant shall ensure that all communications/correspondence made pursuant to this Provisional Certificate of Approval includes reference to the Provisional Certificate of Approval number A411902.
- (10) The Applicant shall notify the Director in writing of any of the following changes within thirty (30) days of the change occurring:
 - (a) change of Applicant or operator of the Site or both;
 - (b) change of address or address of the new Applicant;

Page 3 - NUMBER A 411902

7).

(b)

(8)

(c) change of partners where the Applicant or operator is or at any time becomes a partnership, and a copy of the most recent declaration filed under the <u>Business</u> <u>Names Act</u>, 1991 shall be included in the notification to the Director;

- (d) any change of name of the corporation where the Applicant or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (form 1 or 2 of O. Reg. 182, Chapter C-39, R.R.O. 1990 as amended from time to time), filed under the <u>Corporations Information Act</u> shall be included in the notification to the Director; and
- (e) change in directors or officers of the corporation where the Applicant or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" as referred to in 9(d), supra.
- (11) In the event of any change in ownership of the Site, the Applicant shall notify, in writing, the succeeding owner of the existence of this Provisional Certificate of Approval, and a copy of such notice shall be forwarded to the Director.
- (12) Any information relating to this Provisional Certificate of Approval and contained in Ministry files may be made available to the public in accordance with the provisions of the <u>Freedom of Information and Protection of Privacy Act</u>, R.S.O. 1990, C. F-31.
- (13) All records and monitoring data required by the conditions of this Provisional Certificate of Approval must be kept on the Owner's premises for a minimum period of two (2) years from the date of their creation.

DEVELOPMENT AND OPERATIONS

- (14) Within 3 months of the date of this Notice, the Applicant shall submit to the Director for approval an updated development and operations report and supporting hydrogeological study outlining how the remaining capacity of the Site is to be utilized. These reports shall include the following information
 - site plans showing the waste disposal footprint, buffer zones, and contaminant attenuation zones, if required, including the ownership of such lands;
 - site operation and development plans;
 - daily/intermediate/final cover requirements;
 - security, fencing, signage, site supervision, housekeeping and screening requirements;
 - surface drainage plans, leachate and gas control plans;
 - a proposed monitoring program for landfill gas, leachate, groundwater, and surface water including trigger mechanisms and contingency plans;
 - reporting requirements; and
 - closure plans.

All in accordance with the following plans and specifications which are added to Schedule "A" of the Certificate:

The Application for a Provisional Certificate of Approval for a Waste Disposal Site dated January 11, 2001 as signed by Cathy Reddy, Clerk Treasurer of the Township of Greater Madawaska.

- The letter dated January 31, 2001 to Mr. A. Dominski of the Ministry of the Environment, Environmental Assessment and Approvals Branch from Mr. Brian Whitehead of Jp2g Consultants Inc. providing the purpose and basis for this amendment.
- 3. The letter dated March 1, 2001 to Mr. A. Dominski of the Ministry of the Environment, Environmental Assessment and Approvals Branch from Mr. Brian Whitehead of Jp2g Consultants Inc. requesting that the proposed amendment be split into two parts, one for the service area change and another for the site development aspects as well as the reasons for this request.

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

The reasons for this amendment are to allow for an increase in service area for the waste disposal site and to update the Certificate to meet the Ministry's current requirements.

The reasons for each of the conditions of approval are as follows:

1.

2.

-) The reason for Condition (2) is to define the specific meaning of terms used to simplify the conditions in this Certificate.
- 2) The reason for Conditions (3), (4), (5), (8), (9), (10), (11), (12) and (13) is to clarify the legal rights and responsibilities of the Owner.
- 3) The reason for Condition (6) and (7) is to ensure that the appropriate Ministry staff have ready access to information and the operations of the Site which are approved under this Provisional Certificate of Approval. Condition (7) is supplementary to the powers of entry afforded a Provincial Officer pursuant to the Environmental Protection Act, the Ontario Water Resources Act, and the Pesticides Act, as amended.
- 4) The reason for Condition (14) is to ensure that the continued use and operation of the Site is done in an environmentally acceptable manner.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No.A. 411902 dated March 27, 1980, as amended.

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

Page 5 - NUMBER A 411902

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

The Notice should also include:

The name of the appellant;

3.

4: 5.

6.

7.

i. 8.

1

t

L

C:

The address of the appellant;

The Certificate of Approval number;

The date of the Certificate of Approval;

The name of the Director;

The municipality within which the waste disposal site is located;

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

This Notice must be served upon:

The Secretary* Environmental Appeal Board 2300 Yonge St., 12th Floor P.O. Box 2382 Toronto, Ontario M4P 1E4

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 Appeal Board's requirements for an appeal can be obtained directly from the Board at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

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

DATED AT TORONTO this 12th day of October, 2001

THIS NOTICE WAS MAILED ON C (Signed)

Ian Parrott, P.Eng. Director Section 39, Environmental Protection Act

JK/ District Manager, MOE Ottawa Brian Whitehead, Planner, Jp2g Consultants Inc.

Ontario C	C-	
Ministry	133 Dalton St. Day 020	
of the	Kingston, Ontario	
Environment	K7L 4X6	
The second s	March 27, 1980	1. 1
Dacre Ontanio		÷
NOJ INO.		
RE: Dump Site		
Lot 9, Concession III		
Township of Brougham		
County of Renfrew		

The enclosed revised Provisional Certificate of Approval contains a condition requiring it be registered on title. The reason for this condition is attached to the Certificate.

Two copies of the Certificate and reasons are on long paper to facilitate registration. Both of these should be taken to the Land Registry Office and one returned to the Director with registration particulars.

If your Certificate does not contain sufficient legal description for registration because you have not given one to the Director, you will have to provide one under Section 23(1). (e) of The Registry Act or in your application under The Land Titles Act.

In the event that the site including its buffer, is part of a larger parcel of land and you do not wish to prepare a new survey at this time, you may register the Certificate against the larger parcel of land. If you do so, the Director is prepared, if requested in the future.

1. In the case of land recorded under The Land Titles Act, to consent to an application to delete the registration from the title of lands not within the site including its buffer zone, and

In the case of land recorded under The Registry Act, to issue a Certificate that lands not used for the actual disposal of waste or buffer zone have not been so used.

Such documents would be issued after suitable draft documents including legal description were submitted by you or your successor. The purpose of such documents would be to assure subsequent purchasers that the lands in question were not affected by section 46 of the Environmental Protection Act.

2.

Yours very truly

Ministry of the Environment

Ontario

Provisional Certificate No. A 411902

PROVISIONAL CERTIFICATE OF APPROVAL WASTE DISPOSAL SITE

Under The Environmental Protection Act, 1971 and the regulations and subject to the limitations thereof, this Provisional Certificate of Approval is issued to:

Township of Brougham Dacre, Ontario NOJ 1NO

for the use and operation

of a 1.2 hectare dump site

all in accordance with the following plans and specifications:

ocated:

Lot 9, Concession III Township of Brougham County of Renfrew

which includes the use of the site only for the disposal of the following categories of waste (NOTE: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval) domestic and 5% other wastes, limited to scrap metal, brush, lumber and construction debris.

and subject to the following conditions:

1. No operation shall be carried out at the site after sixty days from this condition becoming enforceable unless this Certificate including the reasons for this condition has been registered by the applicant as an instrument in the appropriate Land Registry Office against title to the site and a duplicate registered copy thereof has been returned by the applicant to the Director.

THIS IS A	TRUE COPY	OF THE MAILED
ON Appr.	9/83	
(Signod)	Lumananana	1. 1.

Dated this 27thday of March , 19 80



Ministry of the Environment



TO: Township of Brougham Dacre, Ontario NOJ 1NO

You are hereby notified that Provisional Certificate of Approval No. A 411902 has been issued to you subject to the conditions outlined therein.

NOTICE

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

The reason for the condition requiring registration of the Certificate is that Section 46 of The Environmental Protection Act, 1971 prohibits any use being made of the lands after they cease to be used for waste disposal purposes in order to protect future occupants of the site and the environment from any hazards which might occur as a result of waste being disposed of on the site. This prohibition and potential hazard should be drawn to the attention of future owners and occupants by the Certificate being registered on title.

You may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board.

This Notice should be served upon:

The Secretary, Environmental Appeal Board, AND 1 St. Clair Ave. West, 5th Floor, Toronto, Ontario. M4V 1K7 The Director, Section 39 Ministry of the Environment, Ministry of the Environment,

DATED

this 27th day of March .

, 1980 -

AAMOIII.

Attachment 2 2021 Annual Report Figures







1						DRAWN BT:	CHECKED BT:	CUENT:	PROJECT:
I	\$Greenview	<u> </u>		-		MAG	DMH		
	ENVIRONMENTAL MANAGEMENT					DESIGNED BY:	APPROVED BY:		SURFACE WATER MONIT
		1	MAR18-22	MAG	ISSUED FOR MECP REVIEW	- MAG	DMH	GREATER MADAWASKA	BLACK DONALD WA
I	13 Commerce Court Bancroft, Ontario 513 332 0057	0	JAN25-22	MAG	ISSUED FOR CLIENT REVIEW	SCALE:	DATE: MAR 2022		TOWNSHIP OF GRI
I	911.332.000 - greenview-environmental.ca	No.	DATE	BY	REMARKS		met 2022	MOV 2022	







Attachment 3 Borehole Logs

02/01/2006 WED 15:54 FAX 705 652 0743 SGS

T.

图002/005

BORE HYDRO Black D	DGEC	DLE LOG DLOGICAL INVESTIGATION	PROJECT:	21-373	;			I	DAT	EHC E: LOC	DLE: 1 13 July 2001	l of	
FOR:	Tow	nship of Brougham		-				E	CLE	VAT	10N 93.4	m	
	AHA			E.	-	S	AM	PLI	C			-	
DEPTH (m)	FRATIGRA	STRATIGRAPHIC DE	SCRIPTION	MONITOR DETAILS	UMBER	TYPE	I VALUE	WATER	REC	RQD	N VALUE	WATE CONTE (%)	
	S	SAND		.tetel en e	4	SS	20	2	80	cha	15 30 45 60	10 20 30	
		Reddish and modium brown fine san medium and coarse sand, trace fine a silt, subtle latminations, moist, compa occasional cobbles observed below (d, trace to some nd coarse gravel, frace et. 0.6 m.		2	SS	25	3	70		-	A	
15		-heavy oxidation observed below 1.2	m.		3	SS	37/	8	50	1		A : :	
2	SOUND	MARBLE BEDROCK Light grey to whitish marble bedrock appearance, some oxidation along fra	, massive, pepper		4	UQ	0.080		100	78			
	BBBBB	between about 1.7 m and 1.9 m. Op oxidation at about 2.10 m to 2.12 m. along fracture at about 2.8 m.	 broken rock in fracture with Minor oxidation. 			100000000000000000000000000000000000000	*						
. 3	1995		8 - A		5	HQ			96	100		1 : : :	
	Gorge				8024								
4				11.12		2002 E 200					::::	1:::	
			1.	1111	. 6	HO			106	96			
5 -			4 ⁴	112	-		÷			-			
				11010						¢.	1111 1111		
6	1000	4	1	1010									
	33813	1	1			AHÓ		3	100	82			
, 7		2	1	1111	- Harris	10.100					111		
7.7	1996				acer								
	Π	Borehole terminated at 7.69 m in ma	rble bedrock.										
				1									
		4						;					
											1111		

and the second

-

-

1

roje roje Ilen ocat	ct N ct: E t: To lon:	o: 10392-001 Ilack Donald Waste Disposal wnship of Greater Madawask Black Donald	Sile					1	Log of Borehole: BH2
	Symbol	Description	Elev	N Value		Method	Type	Well	ogged By: D.Bucholtz
1	RE	Ground Surface - 98:984m	1					Π	Well Equipped with lockable steel casing and weather proof lock.
H		Top Soil Black, organic, dry, with rootlets	-0.6	1 22	-		SS		Concrete
HUHH		Sand Fine, loose, dry Marble Bedrock	1				HQ		- 0.05m dia. PVC
Hanna -		Light gray to white with black specks,							Bontonile
		Fractures trom 1.52m to 2.74m.					HQ IIIIIII		
		Mostly competent, fractures @ 3.35m, 4.88m, 6.40m.			T	T			q
安安						1	Q	-	WL October 8, 2002 = 4,18m
		1		-		1.	Q		Silica Sand
協力の	HAHAA		8	<u> </u>		-			
国内	HHHH		-7.0B			н	a		
		End of Borehole							
		*							
hoo	: CN	E 75 Diamond Bit Coring	_	_	1		1		

02/01/2006 WED 15:54 FAX 705 652 0743 SGS

T.

T.

Τ.

T.

Ľ

Ľ

Ţ

T

Ē

L

1004/005



Ì.

Ł

Ł.

ł.

L

L

1.



Greenview Environmental Management Limited Bacont, Ontario KQL 100 E (613) 332-0057 t (613) 332-1767 e: solutions@greenview-environmental.ca			I	Project Project Client: Locati	t No.: 1 t: Black Towns on: See	2.08.014 Donald Waste Dispo p of Greater Madaw Site Plan	sal Site raska	WW00-5
_	SUBSI	JRFACE STRATA PROFILE		i	SAN	LE		
Depth	Symbol	Description	No.	Туре	% R	SPT N-Value 15 30 45 60	Well Completion Details	- Comments
-4 m								Stick-up = 0.89 m
	~~ ~	Ground Surface	-	140	10		E-MESSEE	Concrete
2		Dark brown, organic, dry, loosely compacted.		100				6
4		Fine to Medium Sand Light brown to grey, fine to medium	2	HQ	80			Bentonite Chips
6		sand, dry, loosely compacted. Marble Bedrock	2	HO	100			1.
10 3		Light grey to white with black specks, marble bedrock.	3	1102	100			
12		Oxidized fractures from 1.83 m to 2.82 m, and from 11.25 m to 12.50 m.	4	НО	90			
14		Mostly competent, fractures from	-					
16 5			5	HQ	100			Silica Sand
20			-					
22 7			6	HQ	100	÷ ÷		
24								
26			7	но	100			
30 9								
32				10	100			Well sores = 0
34				1102	100			$m \ge 0.05 m$
36 1	1	1						31
38			9	HQ	100	*		Water level 1
40								2008 = 12.85 m.
	3		10	HQ	100			
hita		End of Borehole						

1 1 1



ENVIRONMENTAL MANAGEMENT Serview Environmental Management Limited Jank Avenue, P.O. Box 100 ortl, Ontals KOL 1G0 S18) 332-057 S18) 332-767 solutions @greenview-environmental.ex			Log of Monitoring Well: MW08-6 Project No.: 102.08.014 Project: Black Donald Waste Disposal Site Client: Township of Greater Madawaska Location: See Site Plan								
SUBS	URFACE STRATA PROFILE			SAN	PLE						
h Symbol	Description	No.	Туре	% R	SPT N-Value 15 30 45 60	Well Completion Details	Comments				
n				-		+	Stick-up = 0.87 m				
-1	Ground Surface Top Soil Dark brown, organic, dry, loosely Compacted. Fine to Medium Sand Light brown, fine to medium sand, dry,	1	AS HQ	25 100			Concrete Bentonite Chips				
- 3	Marble Bedrock Light grey to white with black specks, marble bedrock. Heavily fractured from 0.05m to 1.45m.	,3	HQ	100	40						
- 5	5.28m, 5.59m, and 7.48m.	4	HQ	100			Silica Sand				
		5	HQ	95		ż	Water level June 8 2008 = 5.50 m				
7		6	HQ	100			÷φ				
9		7	HG	100							
- 11		8	HG	100							

Greenview Environmental Management Limited Bacrott, Ontario KO. 100 Barrott, Ontario KO. 100 Exercited State State Barrott, Ontario KO. 100 Exercited State State State State State State State State State Sta			P F C	roject Project Client: Locatio	No.: 1 :: Black Towns on: See	Log of Mc 02.08.014 Conald Waste Dispo hip of Greater Madav e Site Plan	onitoring Well: M osal Site vaska	W08-6	
1 1	SUBSUR	RFACE STRATA PROFILE		-		SAM	MPLE	1	
Depth	Symbol	Description		No.	Туре	% R	SPT N-Value 0 15 30 45 60	Well Completion Details	Comments ·
38 40 40				9	HQ	100			1
42-ph/				10	HQ	100			
40 48 50 101				11	HQ	100			
52 54 56 56			14)	12	HQ	100			
58 60 60	3			13	HQ	100			
62 hhad had had had had had had had had ha	0			14	HQ	100			a t
684hhhhhhh 6870		×		15	5 HG	100			
72-thinking 2 74-thinking 2	2			16	5 SS	3 100			Well screen = 6 m x 0.05 m
76		End of Borehole	×	4		C			· · · ·

2

110

ц. 1

A TOTAL TO A

-

_

senview B Cleak Aven creft, Onla 513) 332-0 513) 332-0 513) 332-1 513) 332-1 513) 332-1 513) 332-1 513) 332-1 513) 332-0 513) 32-0 513) 32-0 5100 32-0 51000 32-0 5000 32-0 500000000000000000000000000000000000	Gr ENVIRON ENVIRON ENVIRON Ma FOL BAC Ma FOL BAC ST St Greenview-enviro	CONTAL MANAGEMENT Management Limited		Projec Projec Client: Locati	t No.: t: Blac : Town on: Se	Log of M 102.08.014 Ik Donald Waste Disp ship of Greater Mada ee Site Plan	onitoring Well: oosal Site waska	MW08-7
)epth	SUBS Symbol	URFACE STRATA PROFILE Description	No.	Туре	SA % R	SPT . N-Value 0 200 400 600	Well Completion Details	Comments
		Ground Surface						Stick-up = 0.85 m
		Medium Sand and Gravel Brown, medium sand with small to medium gravel, wet, compacted. Fine to Medium Sand and Gravel Light brown, fine to medium sand with	1	AS	10		<u> </u>	Water level June
4 4	5-5-2	small to medium gravel, wet, compacted.	2	. 55	10			2008 = 0.91 m
hilli			з	SS	5	•		Bentonite Chips
hilph:			• 4	SS	15	-		
3 5 5		Fine to Medium Sand Light brown, fine to medium sand, wet, compacted, small to medium cobble at 3.05 m.	5	SS	.50			Silica Sand
անդիսիսի 8			6	SS	10			
22 24 24 24 24 24 24 24 24 24 24 24 24 2			7	SS	75			Well screen = 3. m x 0.05 m
20 tuhnlin		End of Borehole						· .
Dri Dri	illed By: Li	antech Drilling Ltd. Hollow Stem Augers	_			<u>.</u>	Logged By Checked E	r: J. Balley By: T. Peters

÷

Attachment 4 Current vs Proposed Monitoring Program

ATTACHMENT 4 Current vs. Proposed Monitoring Program

Current Program: Schedule B, ECA A411902

Site Groundwater and Surface water Monitoring Program:

Location	Frequency	Parameters
<u>Groundwater</u> BH1, BH2, BH3, BH4, MW08-5, MW08-6, MW08-7 1 QA/QC	Twice per year (Spring, Fall)	Alkalinity, aluminum, ammonia, barium, boron, cadmium, calcium, chromium, cobalt, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, phenols, potassium, silicon, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc. Field measurements (pH, conductivity, temperature), water
		levels
BH1	Once every 5 years (Spring)	VOCs- EPA 624
Surface Water SW-3, SW-4, SW-5, SW-6 1 QA/QC	Three Times (Spring, Summer, Fall)	Alkalinity, ammonia, BOD, boron, cadmium, calcium, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate nitrite phenols, potassium sodium, strontium, sulphate total phosphorus, TKN, TDS, zinc, TSS Field measurements (pH, conductivity, dissolved oxygen, temperature, unionized ammonia (calculation))

Proposed Program:

Location	Frequency	Parameters
Groundwater BH1, BH2, BH3, BH4, MW08-5, MW08-6, MW08-7 + 1 bilevel monitoring well + 1 bedrock monitoring well (possible replacement of BH3) 1 QA/QC	Twice per year (Spring, Fall)	Alkalinity, aluminum, ammonia, barium, boron, cadmium, calcium, chromium, cobalt, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, phenols, potassium, silicon, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc Add: conductivity, pH, mercury, arsenic, lead, nitrite, TSS (leachate), BOD5 (leachate) Field measurements (pH, conductivity, temperature), water levels. Add: landfill gas
BH1 (leachate)	Once every 5 years (Spring)	VOCs- EPA 624
Surface Water SW-4, SW-5 1 QA/QC	Three Times (Spring, Summer, Fall)	Alkalinity, ammonia, BOD, boron, cadmium, calcium, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate nitrite, phenols, potassium sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc, TSS Add: conductivity, pH, lead, mercury, arsenic, barium, chromium Field measurements (pH, conductivity, dissolved oxygen, temperature, unionized ammonia (calculation)), Add: flow

Attachment 5 Drawings



A B B B B B B B B B B	
of Bagot, Blythfield, & 1. concesson =	BROUGHAN
BP OF BAGOT, D, & BROUGHAM Waste Disposed Site CONDITIONS FLAM	1













BM #1 ELEV. 100.000 ASSŰMED ELEVATION SPIKE IN TOP OF 3000 POPLAR STUMP, APPROXIMATELY 5m NORTH EAST OF RIGHT GATE POST AT ENTRANCE TO WASTE SITE.

BM #2 ELEV. 98.572 SPIKE IN SOUTH WEST SIDE OF 3000 POPLAR LOCATED AT NORTH EAST END OF SITE, APPROXIMATELY 22m FROM TSP #3.

101,0

BAR SCALE

EXISTING CONDITIONS ARE BASED ON TOPOGRAPHIC SITE SURVEY BY Jp2g CONSULTANTS INC. DATED NOVEMBER 6, 2001.

DESIGNED DRAWN MOC CHECKED APPROVED SCALE HORIZ. 1:400

TOWNSHIP OF GREATER MADAWASKA BLACK DONALD LANDFILL SITE

EXISTING CONDITIONS PLAN

date MAY 2002 PROJECT 2006017 PLOTTED May 07/2002 DRAWING xisting2001.dwg

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.









С.	DESIGNED MAB DRAWN KJK/SPM CHECKED KM APPROVED SCALE	TOWNSHIP OF GREATER MADAWASKA BLACK DONALD WASTE DISPOSAL SITE
	1:500	PHASE 5 AND FINAL CONTOURS



Ministry of the Environment, Conservation and Parks Eastern Region 1259 Gardiners Road, Unit 3 Kingston ON K7P 3J6 Phone: 613.549.4000 or 1.800.267.0974 Ministère de l'Environnement, de la Protection de la nature et des Parcs Région de l'Est



et des Parcs Région de l'Est 1259, rue Gardiners, unité 3 Kingston (Ontario) K7P 3J6 Tél: 613 549-4000 ou 1 800 267-0974

MEMORANDUM

January 6, 2023

- TO: Thandeka Ponalo Senior Environmental Officer Ottawa Area Office Eastern Region
- FROM: Alija Bos Hydrogeologist Water Resources Unit Technical Support Section Eastern Region
- RE: Black Donald Waste Disposal Site A411902 2021 Annual Monitoring Report ECHO Task #1-134990036

As requested, I have reviewed the following documents entitled:

- "2021 Annual Report, Black Donald Waste Disposal Site (A362202), Township of Greater Madawaska, Count of Renfrew, Ontario" dated March 21, 2022, prepared by Greenview Environmental Management (GEM)
- "Black Donald Landfill Site Township of Greater Madawaska, ECA No. A411902, Expansion Feasibility Study" Prepared by JP2G Consultants Inc., dated October 25th, 2022.

The Township of Greater Madawaska submitted an assessment on the feasibility to expand the site for continued disposal of bulky and Construction and Demolition (C&D) waste. Based upon the information provided in the document above, I submit the following comments for your consideration. I have provided main conclusions and recommendations in the "Summary" section of this memorandum and more detailed comments in the "Conclusions and Recommendations" section below.

<u>Summary</u>

- The migration of leachate is downward into a thin sand layer and into the fractured marble bedrock.
- A north-south trending groundwater divide is thought to exist beneath the waste mound causing landfill leachate to migrate west and east. groundwater level data confirms that a groundwater basin exists in and around BH4 which would limit the northwestward migration of leachate.

- The Black Donald site was interpreted to conform with MECP Guideline B-7 at the downgradient eastern and southwestern CAZ boundaries in 2021.
- I recommend that the report should be reviewed by the Surface Water Unit.
- I support the proposed expansion area from a groundwater perspective, provided additional multilevel downgradient monitoring wells are installed, monitoring well BH3 is replaced, and the monitoring program and trigger mechanism are updated as discussed below.

Site Description and Environmental Compliance Approval

The Black Donald Waste Disposal Site (WDS) is located on part of Lot 9, Concession 2 and 3, geographic Township of Brougham in the Township of Greater Madawaska, Ontario.

The Black Donald WDS operates under Environmental Compliance Approval No. A411902 last amended January 24, 2013, which describes the Site as a 1.2 hectare waste disposal site. ECA Section (2) 2.12 defines the Site as 'the entire waste disposal site including the landfilling area and the buffer lands as listed in Schedule "A" of the Certificate and consisting of approximately 1.2 hectare landfill site". Upon review of the documents in Schedule "A" the Site comprises a 0.9 ha landfilling area within a total site area of 27.2 ha.

The site received waste from the Township's Griffith, Norway Lake, and Mount St. Patrick Transfer Stations.

It was previously requested (2016) by Greenview and the Township that MECP consider removing the requirement for surface water sampling as part of the monitoring requirements, as surface water quality data did not indicate impacts related to landfill-related activities. Based on the MECP surface water technical support review, it was indicated that monitoring should continue as part of the environmental monitoring program.

Proposed Expansion

It is my understanding that the current site has a design waste capacity of 34,250m³ (excluding final cover). The theoretical maximum capacity of a 1.2 ha site to a pyramidal peak is 54,200m³.

The figure provided by GEM illustrates a conceptual expansion which could add another 30,000 to $<40,000m^3$. A change of less than $40,000m^3$ is exempt from the EA Act. As such, JP2G has recommended the application be less than $40,000m^3$. This represents a proposed expansion of \sim 73% from the current approval.

As of December 14, 2021, the remaining capacity was 4400m³ (Greenview, 2022). The life expectancy could be 2 to 5 years depending on the annual landfilling rate.

The WDS was closed to the public on April 5th, 2010, with disposal available for municipal vehicles and Township-approved haulers only. Since 2010 the site has been used for the stockpiling of construction and demolition and bulky wastes prior to processing and disposal within the approved waste disposal area (AWDA). Bentonite clay material was placed at the WDS in 2021, as part of the regular and final cover requirements.

Topography and Drainage

The consultant described the area to be generally hilly and forested. The site is located on a topographic high, and a steep slope leading to a low-lying area is located at the south, west and southeast limit of the waste site. Drainage is through the surficial sand at the site following topography to roadside ditches along Hydro Dam Road.

Geological and Hydrogeological Conditions

Overburden geology is characterized by a thin veneer of sandy overburden, 0.3-1.5 metres thick, overlying the fractured marble bedrock unit. Bedrock outcrops, knolls, and knob hills are noted the be prevalent in the vicinity of the Black Donald site, which confirms the shallow nature of overburden soils and the proximity of the bedrock contact to surface near the site.

The hydrogeological conceptual model for the site is that landfill leachate moves down into the underlying native sand unit, then into groundwater in the fractured marble bedrock where it flows southeast and southwest. Groundwater was encountered in the shallow fractured marble bedrock.

It is interpreted that a groundwater divide exists at the waste mound, and predominant flow is southeast and southwest.

An eastward trending groundwater flow direction was interpreted in the vicinity of monitoring well MW08-6. Based on the upgradient location of MW08-6 relative to the waste mound, groundwater quality at MW08-6 was interpreted to be characteristic of background groundwater quality at the site. A north-south oriented groundwater basin depression was also interpreted to exist in the vicinity of BH4 and MW08-5, based on groundwater elevations and contours measured and calculated from field measurements.

The closest residential well is located approximately 700m northwest and upgradient from the site.

Groundwater – Surface Water Interaction

The groundwater is inferred to eventually discharge to surface water downgradient within the CAZ of the site.

Based on the surface water quality results in 2021, and the significant distance of each sampling location from the Black Donald site, the surface water systems south and southeast of the Black Donald site were not interpreted to be impacted from landfill-

related activities by GEM. Detailed review and interpretation of surface water conditions are provided by the ministry's surface water reviewer.

Groundwater Monitoring

The monitoring program approved under the current ECA is to satisfy Condition 27. The monitoring program as detailed in ECA Schedule "B" consists of the bi-annual collection of static water levels and groundwater samples from seven (7) monitoring wells, and surface water samples collected three times per year from four (4) locations.

GEM conducted spring (May 18), and fall (November 4) groundwater monitoring of the site in 2021. This was an approved reduction from the Spring, Summer and Fall sampling previously occurring. The Township with support from their consultant sampled and surveyed the monitoring wells and surface water stations.

Background Water Quality

MW08-6 is considered the background well installed on Crown Land on the opposite side of the Hydro transmission line. This well has shown DOC ODWS non-conformance and an increasing trend in the past 5 years.

BH2 is also considered a potential background location located approximately 25m east and downgradient of the fill area. Water quality is characterized by elevated concentrations of some landfill leachate parameters however given the proximity to Hydro Dam Road, road salting may also be a factor. There was one ODWS nonconformance for Dissolved Organic Carbon (DOC) at BH2. There appears to be an increasing DOC trend in this well. This well is not an ideal background location and MW08-6 should be used for background water quality assessment moving forward.

Leachate Quality

BH1 has historically been used for VOC sampling and can be considered the leachate characterization well at this site.

Groundwater at BH-1 was interpreted to be most representative of leachate quality at the Black Donald site. Non-conformances of ODWS and significant groundwater trends at groundwater monitoring location BH-1were as follows:
Monitoring Well	ODWS Non-	Conformanc e	Five (5) Year Trend Analysis		
	Spring 2021	Fall 2021	Increasing	Decreasing	
BH1	 Alkalinity DOC Hardness Manganese Total Dissolved Solids (TDS) 	 Alkalinity DOC Hardness Iron Manganese TDS 	 Ammonia (un-ionized) Nitrate Sodium Sulphate 	 Aluminum Barium Calcium Chloride Hardness Iron Magnesium Manganese Potassium Strontium Total Kjeldahl Nitrogen (TKN) 	

These values are not surprising given the well location immediately downgradient of the waste mound. Older landfills often have nitrogen concerns as a result of the generation of ammonia, and nitrate, dissolved solids and the concentrations of these vary depending on the age of the landfill.

Based on 2021 results, groundwater at BH-4 was interpreted to be impacted by landfillrelated activities: however, to a lesser extent than at leachate monitoring well BH-1. The interpretation that groundwater in the western portion of groundwater flow at the site was less impacted than the eastern component of groundwater flow at the site was supported by horizontal gradients calculated in spring, summer, and fall 2021 and documented groundwater quality. Considering the groundwater flow directions calculated following 2021 groundwater monitoring events and based on similar historical calculations, BH4 was interpreted to be the downgradient receiver of groundwater flow from the vicinity of the waste mound and from the northwest in the vicinity of background monitoring well MW08-6.

Downgradient Water Quality / Trigger Mechanism

Groundwater immediately downgradient from the site at monitoring wells BH1, BH3, and BH4 was interpreted to be impacted from landfill-related activities in 2021. Most parameter concentrations were above median background groundwater quality results, with non-conformances of ODWS for concentrations of alkalinity, DOC, hardness, iron, manganese, and TDS noted at select monitors. The generally lower parameter concentrations at monitoring well BH3 compared to those at monitoring wells BH1 and BH4 were attributed to its location partially cross-gradient to the waste mound and along the groundwater divide at the site. BH4 is the southwest CAZ boundary well.

It was interpreted that concentrations resultant of landfill-related factors originating in the vicinity of the waste mound would not likely migrate past the western CAZ boundary. Instead, groundwater was interpreted to flow in a southerly direction along the apparent groundwater basin towards MW08-5 and the downgradient southwestern CAZ boundary. Therefore, it is interpreted that given the considerable distance of BH4 to the downgradient southwestern CAZ boundary (approximately 170 m), and naturally-occurring high concentrations of alkalinity, aluminum, DOC, hardness, and TDS in the background, the site was interpreted to conform with MECP Guideline B-7 and was in

compliance with RUC in 2021 at the southwestern CAZ boundary. Given historical flow direction maps, I find this assumption to be reasonable. Groundwater flow directions calculated in fall 2021 are different than historical measurements as a result of BH3 being destroyed and therefore a weight bias for the model has shifted to the remaining wells. A replacement well for BH3 should be installed.

Guideline B-7

Guideline B-7 indicates that the groundwater quality cannot be degraded by an amount in excess of 50% of the difference between background and the Ontario Drinking Water Standards for non-health related parameters and in excess of 25% of the difference between background and the Ontario Drinking Water Standards for health-related parameters.

No RUC non-conformances were documented in results from downgradient monitoring well MW08-7 in 2021 that were attributed to landfill-related factors. The noted RUC non-conformance in fall 2021 at MW08-7 for DOC was consistent with DOC concentrations observed in background wells BH2 and MW08-6. Based on the above, the Black Donald site was interpreted to conform with MECP Guideline B-7 at the downgradient eastern CAZ boundary in 2021. Based on 2021 results, it was extrapolated that given the considerable distance of BH4 to the downgradient southwestern CAZ boundary (approximately 170 m), and naturally occurring elevated concentrations of alkalinity, aluminum, DOC, hardness, manganese, and TDS in the background (BH2 and MW08-6), the site was interpreted to conform with MECP Guideline B-7 at the southwestern CAZ boundary.

Based on the surface water quality results in 2021, and the significant distance of each sampling location from the Black Donald site, the surface water systems south and southeast of the Black Donald site were not interpreted to be impacted from landfill-related activities by the consultant. Non-conformances of PWQO for concentrations of DO (low), phosphorus, iron and zinc noted in 2021 at select sampling locations for select sampling dates were attributed to naturally occurring conditions in the background (SW-4), as well as to low-flow surface water conditions.

In 2021, PWQO non-conformances at key trigger locations SW-3 and SW-6 for concentrations of iron were attributed to low water/ low-flow conditions, and not to landfill-related activities. Similarly, PWQO non-conformances for concentrations of phosphorus at key trigger location SW-3 were generally consistent with concentrations observed at background location SW-4 and were therefore not attributed to landfill-related factors.

No RUC non-conformances were noted for any of the key trigger parameters at key trigger location MW08-7 following inclusion of 2021 results. Based on a review of five (5) year time trend analysis for parameters un-ionized ammonia, barium, boron, chloride, chromium, COD, iron, nitrate, sodium, sulphate, TKN and total phosphorus, the Trigger Mechanism was not interpreted to be activated in 2021.

Conclusions and Recommendations

The migration of leachate is downward into a thin sand layer and into the fractured marble bedrock.

A north-south trending groundwater divide is thought to exist beneath the waste mound causing landfill leachate to migrate west and east. groundwater level data confirms that a groundwater basin exists in and around BH4 which would limit the northwestward migration of leachate.

The Black Donald site was interpreted to conform with MECP Guideline B-7 at the downgradient eastern and southwestern CAZ boundaries in 2021.

I recommend that the report should be reviewed by the Surface Water Unit.

The consultant has provided the following recommendations in relation to the proposed expansion and my response to each recommendation is provided in bold typeface:

1. The updated monitoring program will continue to sample the monitoring wells as per ECA Schedule "B", with the proposed addition of the following as shown on Drawing No 2 below (Greenview base plan)

• one (1) bi-level monitoring well within the overburden (if available) and bedrock aquifers east of the landfilling area to further delineate the plume within the groundwater towards MW08-7; I support this recommendation in order to evaluate the potential for offsite migration of leachate impacted groundwater downgradient of the expansion area.

• compliance well MW08-7 is installed in the overburden (sand material), therefore it is recommended to also install a bedrock monitoring well in this location to delineate leachate in the bedrock aquifer in this direction; I support this recommendation. This is shown in the figure included below from the GEM report. The red line represents the proposed expansion areas.

I would like to request an additional design drawing be submitted with the cross section of the waste areas (historical and proposed) including elevations.



• monitoring well BH3 was destroyed in 2021 due to landfilling activities; this well should be reinstated to aid in assessing leachate migration south of the fill area. I support this recommendation.

2. The water quality analysis will be expanded to Schedule 5 Column 1 of the Landfill Standards (1988).

This includes the following parameters: Alkalinity, aluminum, ammonia, barium, boron, cadmium, calcium, chromium, cobalt, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, phenols, potassium, silicon, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc.

I support the proposed use of Schedule 5 Column 1 and also recommend that the following parameters are also added to the regular groundwater monitoring program: conductivity, pH, mercury, arsenic, lead, nitrite, TSS (leachate), BOD5 (leachate). I further recommend that the following field measurements are added to the regular groundwater monitoring program: pH, conductivity, temperature, water levels and landfill gas measurements.

Upon installation and sampling it is further recommended to update the trigger mechanism and contingency plan to reflect the proposed expansion and additional monitoring locations. **I support this recommendation.**

I support the proposed 73% expansion area from a groundwater perspective, provided additional multilevel downgradient monitoring wells are installed, monitoring well BH3 is replaced, and the monitoring program and trigger mechanism are updated as discussed above.

Alija Bos

P.Geo., Regional Hydrogeologist

- ec: Mark Phillips, Surface Water Specialist Thandeka Ponalo, Sr. Environmental Officer V. Castro, Water Resources Unit Supervisor C. Klein, Technical Support Section Manager
- c: GW File RE GM 01 02 (Black Donald Waste Disposal Site) AB / ECHO 1-134990036

Ministry of the Environment, Conservation and Parks Eastern Region 1259 Gardiners Road, Unit 3 Kingston ON K7P 3J6 Phone: 613.549.4000 or 1.800.267.0974 Ministère de l'Environnement, de la Protection de la nature et des Parcs Région de l'Est 1259, rue Gardiners, unité 3 Kingston (Ontario) K7P 3J6

Tél: 613 549-4000

ou 1 800 267-0974



MEMORANDUM

January 11, 2023

- TO: Thandeka Ponalo Senior Environmental Officer Ottawa District Office Eastern Region, MECP
- FROM: Mark Phillips Surface Water Scientist, Water Resource Unit, Eastern Region, MECP

RE: 2021 Annual Monitoring Report and Expansion Feasibility Study Black Donald Waste Disposal Site Part Lot 9, Concession 3, Geographic Township of Brougham 34 Hydro Dam Road, Township of Greater Madawaska, County of Renfrew Certificate of Approval (ECA) No. A411902 ECHO #: 1-134948602

I have reviewed the following documents from a surface water impact perspective and provide the recommendations below for your consideration:

- 1. 2021 Annual Report (Greenview Environmental Management Limited; March 21, 2022);
- 2. Black Donald Landfill Site Expansion Feasibility Study (Jp2g Consultants Inc.; October 25, 2022);
- 3. Memorandum from B. Metcalfe on the 2015 Annual Monitoring Report Black Donald Waste Disposal Site (Metcalfe; July 4, 2016); and
- 4. Memorandum from A. Bos on the 2021 Annual Monitoring Report (Bos; January 6, 2023).

Background

The Black Donald Waste Disposal Site (WDS) operates as an active waste disposal site and in accordance with the Provisional Certificate of Approval A411902. The Black Donald WDS was closed to the public on April 5, 2010. However, disposal operations at the site are currently available to municipal vehicles and Township-approved haulers only. The site is currently operating as a municipal solid waste landfill, accepting domestic, construction and demolition, and bulky waste for disposal. The landfill site currently consists of an approved fill area of 0.9 ha within a total licensed area of 21.36 ha, inclusive of lands used for operational buffer and CAZ purposes. The landfill site functions as a natural attenuating site. Based on the 2021 fill rate, the remaining capacity at this site was calculated to be approximately 4,400 m³ which equates to approximately 5 years of remaining capacity.

Surface Water Regime

The landfilling area is located on a topographical high bounded to the north by a bedrock ridge along the hydro transmission corridor. Site/area groundwater and surface water flow direction has been determined to be to the southeast and southwest. The primary pathway for groundwater flow is interpreted to flow downgradient towards discharge within the CAZ lands. Surface water sampling locations are located at the intermittent creek and wetland/bog complex approximately 500 metres downgradient from the site. The WDS is located within the Black Donald Lake watershed, Madawaska River Basin.

2021 Annual Monitoring Report

In 2021 surface water monitoring was conducted by Greenview on May 18, August 19, and November 4. Surface water samples were collected when water was present at sample stations SW3, SW4, SW5 and SW6. The collected surface water samples were analyzed for routine general chemistry parameters, a limited metals parameters analyses and phenols. Field measurements were taken for pH, conductivity, dissolved oxygen and water temperature for each surface water sampling event.

The 2021 surface water monitoring program measured PWQO exceedances at SW-4 for total phosphorus and zinc; for iron and low dissolved oxygen at SW-5; for total phosphorus and (high) pH at SW-6; and for total phosphorus, iron, manganese, and zinc at SW-3.

None of the exceedances have been attributed to landfill related impacts. The trigger mechanism was not triggered in 2021.

Expansion Feasibility Study

The proposed expansion at this site would involve the addition of 30,000 to < 40,000 m³ of waste disposal capacity.

The proposed expansion is to be completed in 5 phases, with final cover applied to completed areas following each phases' completion.

A sewage works consisting of swales for the collection and transmission of stormwater to one of two stormwater control ponds is being proposed. Both ponds will be affixed with outlet control structures.

Comments/Recommendations

- The consultants indicate that the PWQO exceedances measured in 2021 were minor and not attributed to the landfill related impacts. I agree with this assessment.
- The consultants have recommended a reduction in the surface water monitoring locations to include the background station (SW-4) and SW-5 only. I support this recommendation. Following the completion of the recommended topographic survey it would be preferable to establish a surface water monitoring station(s) down-gradient of the landfill in closer proximity to the waste disposal site. If a surface water monitoring location exists between SW5 and the landfill, then I would support removing SW-5 as well, since it is located a substantial distance from the WDS.
- The consultants have also recommended that the sampled parameters list be increased to match Schedule 5, Column 3 of the Landfill Standards. I support both these recommendations, however I recommend the inclusion of calculated unionized ammonia. I would also suggest that the surface water sampling program be reduced to twice per year (spring, fall) to match the groundwater sampling program.
- The consultants have recommended that a new topographic survey be completed and that additional surface water station locations will be identified as appropriate. I agree with this recommendation and would further add that a monitoring sample location be established at the outlet of the proposed surface water control ponds (sewage works outlets).
- The topographic survey should detail the outlet flow paths from the stormwater works.
- Specific design details for the stormwater works should be provided for review.

The existing waste disposal site has not been found to be causing a risk to surrounding surface water features. In my opinion the risk of surface water impacts to area surface waters from the proposed expansion is low. I support, in principle, the proposed expansion.

Please contact me if you have any questions regarding the above comments.

Original to be Signed

Mark Phillips

ec: C. Klein, Tech. Support Manager, MECP V. Castro, (A)WRU Supervisor, MECP E. Tieu, Ottawa District Supervisor, MECP Groundwater Unit Files (A. Bos) ECHO



Jp2g No. 22-6213A

January 25, 2023

Ministry of the Environment, Conservation and Parks 2430 Don Reid Drive, Unit #103 Ottawa, ON K1H 1E1

Attention: Thandeka Ponalo Sr. Environmental Officer

Re: Black Donald WDS ECA No. A362202 Expansion Feasibility Study

Dear Thandeka:

We acknowledge receipt of the Groundwater review comments dated January 6, 2023 and the Surface Water review comments dated January 11, 2023 on our October 25, 2022 submission.

The following conclusions and recommendations from the memorandums have been reproduced (in part) in **bold** for convenience, and our response provided:

Alija Bos Hydrogeologist January 6, 2023 review of:

- 2021 Annual Report March 21, 2022 by Greenview Environmental Management
- Expansion Feasibility Study October 25, 2022 by Jp2g
- 1. The updated monitoring program will continue to sample the monitoring wells as per the ECA Schedule "B" with the addition of the following:
 - A bi-level monitoring well within overburden (if available) and bedrock located east of landfilling area towards MW08-7
 - A bedrock monitoring well in the MW08-7 location. Request a cross section drawing of the waste area (historical and proposed) including elevations
 - A replacement well for BH-3

Jp2g have prepared an estimate of probable costs to complete the new well installations in 2023 for consideration of Council. Regarding the plan and cross section drawing, there is additional survey required of the expansion area scheduled in the spring 2023, these plans will be included in the 2023 Annual Report.



Ottawa 1150 Morrison Dr., #410 Ottawa, ON, K2H 8S9 T: 613-828-7800 Ottawa@jp2g.com Pembroke 12 International Dr. Pembroke, ON, K8A 6W5 T: 613-735-2507 Pembroke@jp2g.com **Arnprior** 16 Edward St. S., #53B Arnprior, ON, K7S 3W4 T: 613-828-7800 Arnprior@jp2g.com



2. The water quality analysis will be expanded to Schedule 5 Column 1 of the Landfill Standards (1998). Upon new well installation and sampling an updated trigger mechanism and contingency plan is recommended. Jp2g will conduct the 2023 monitoring with the more comprehensive set of parameters first with the existing wells and then to include the new wells when installed. The current trigger and contingency plan is detailed in Section 6.2 of the Design, Development and Operations Plan December 2010. An updated trigger mechanism and contingency plan will be provided based on the more recent sampling results and will be presented in the final Expansion Feasibility Study.

Mark Phillips Surface Water Scientist January 11, 2023 review of:

- 2021 Annual Report March 21, 2022 by Greenview Environmental Management
- Expansion Feasibility Study October 25, 2022 by Jp2g
- Memo by B. Metcalfe on the 2015 AMR
- Memo by A. Bos on the 2021 AMR
- 1. I support the reduction of sampling locations to include SW-4 and SW-5. Following completion of the topographic survey it is preferable to establish a monitoring station(s) closer to the waste disposal site.

Jp2g will conduct the survey in the spring 2023 and observe the spring freshet for potential locations.

2. I would further add that a monitor sample location be established at the outlet of the proposed surface water control ponds (sewage works outlets).

The Greenview Design, Development and Operations Plan December 2010 does not include control ponds but drainage ditches along the north-eastern portion of the fill area adjacent to Hydro Dam Road and at the southwest corner of the site. The final Expansion Feasibility Study will include an assessment of the requirement for new surface water controls.

3. The topographic survey should detail the outlet flow paths from the stormwater works.

Agreed.

4. Specific design details for the stormwater works should be provided for review.

The final Expansion Feasibility Study will provide adequate detail to confirm surface water flow paths and additional monitoring locations to assess environmental compliance.

Yours truly, Jp2g Consultants Inc. ENGINEERS • PLANNERS • PROJECT MANAGERS

Kevin Mooder, MCIP RPP Principal | Environmental Services

cc Leonard Emon



Jp2g No. 22-6213A

December 29, 2023

Ministry of the Environment, Conservation and Parks 2430 Don Reid Drive Ottawa, ON K1H 1E1

Attention: Thandeka Ponalo Sr. Environmental Officer

Re: Black Donald Landfill Site Township of Greater Madawaska ECA No. A411902 Expansion Feasibility Study

Dear Thandeka:

In order to finalize a 2024 work plan and budget we request further MECP review to support an application to Amend the ECA for an additional <40,000m³ landfilling capacity proposed for 2024.

Relevant copies of documentation are included in **Appendix 1**:

- October 25, 2022 Jp2g Feasibility Assessment
- January 6, 2023 TSS Groundwater Alija Bos
- January 11, 2023 TSS Surface Water Mark Phillips
- January 25, 2023 Jp2g Response

The purpose of this submission is to provide an update on the tasks completed in 2023 to address the issues identified by TSS. The proposed expansion of the landfilling area is illustrated on **Drawing 1**.

Monitoring Well Installations

On October 30 and 31, 2023 additional monitoring wells were installed as shown on **Figure 1**, copies of the well records are included in **Appendix 2**.

- BR23-85 (shallow) and BR23-8D (deep) installed between landfilling area and MW08-7
- MW23-7D installed near MW08-7S installed in the deep overburden
- BH-3 was located but it had been destroyed, a replacement well wasn't installed as the MW23-8 nest was located close by and out of the landfilling area expansion

Expanded Monitoring Program

The 2023 groundwater monitoring program involved the more comprehensive laboratory analysis of parameters listed in Schedule 5 Column 1 of the Landfilling Standards (1998) as agreed to by MECP.



Ottawa 1150 Morrison Dr., #410 Ottawa, ON, K2H 8S9 T: 613-828-7800 Ottawa@jp2g.com Pembroke 12 International Dr. Pembroke, ON, K8A 6W5 T: 613-735-2507 Pembroke@jp2g.com **Arnprior** 16 Edward St. S., #211 Arnprior, ON, K7S 3W4 T: 613-626-0780 Arnprior@jp2g.com



Reduced Monitoring Program

The 2023 surface water monitoring program included SW4 and SW5 as agreed to by MECP. Based on Jp2g site reconnaissance and field survey of the proposed expansion area on April 18, 2023 and other site visits, there are no permanent watercourses where surface water flow may occur from the landfilling area. There is a natural depression feature at the northwestern corner of the existing landfilling area, however no intermittent flow was observed. Similarly, no flowing water was observed in the ditch along Hydro Dam Road.

Monitoring Stations at Sewage Works Outlets

The feasibility of a sewage works outlet at the northwestern corner of the fill area will be confirmed as part of the detailed design.

Outlet Flow Paths

Additional field survey will be conducted to identify any flow paths from any sewage work outlet.

Stormwater Design

Pending results of additional site survey future monitoring of the flow paths from the sewage works will be provided.

Yours truly, Jp2g Consultants Inc. ENGINEERS • PLANNERS • PROJECT MANAGERS

Kevin Mooder, MCIP RPP Principal | Environmental Services

Encls.

cc. Leonard Emond, Facilities Manager



DWG NAME: J:\6-ENVIRONMENTAL\ACTIVE\2022\22-6213A - GREATER MADAWASKA WDS\DRAWINGS\BLACK DONALD\CAD FILES\EXISTING CONDITIONS QS BEST VERSION 2023 WITH EXPANSION.DWG LAYOUT: EXPANDSION FEASIBILITY STUDY SAVED ON January 2, 2024



Vegetation

Property Line

Expansion area





DRAFTED: QS		PROJECT No.:	22-6213A
CHECKED: KM		REVISION DATE:	2023-12-20
CHECKED: KM	APPROVED: KM	REVISION No.:	
SCALE: 1:1000		SHEET No.:	1 of 1



Jp2g Consultants Inc. Engineers · Planners · Project Managers

12 INTERNATIONAL DRIVE, PEMBROKE, ON Phone: (613)735-2507, Fax:(613)735-4513 1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON Phone: (613)828-7800, Fax: (613)828-2600

Black Donald Landfill Site - Greater Madawaska

Monitoring Locations with Site Property Limit

DWG NAME: J:\6-ENVIRONMENTAL\ACTIVE\2022\22-6213A - GREATER MADAWASKA WDS\DRAWINGS\BLACK DONALD\CAD FILES\EXISTING CONDITIONS QS BEST VERSION 2023 WITH EXPANSION.DWG LAYOUT: NEW WELL AERIAL SAVED ON January 2, 2024

DRAFTED: QS		PROJECT No.:	22-6213A
CHECKED: KM	I	REVISION DATE:	2023-12-20
CHECKED: KM	APPROVED: KM	REVISION No.:	
SCALE: 1:9028		SHEET No.:	1 of 1

Onta	rio 🕅	Ministry Conser	of the Env	vironment, Parks	Well Ta	ag No. (Pla	ce Sticker	and/or	r Print Be	low)	Regulatio	n 903 (Ontario	Well	Record
Measuren	nents recor	ded in:	Metric] Imperial		15060	720						Pa	ge	of
Well Ow First Name	/ner's Info e	ormation	Last Name/	Organizatio	n				E-mail A	ddress					
Mailing Ad	dross (Strac	DAC	Weate	rm	dauy	ista			-	aarooo				by Vel	Vell Owner
19 Pr	Implies (Stree	A P.O.	ZOX 18	D			me		Province		Postal Code) +])	Telepho	ne No. (in	c. area code)
Well Loc	ation	on (Street Nu	mbor/Name)			Taurahia									
H	udi o	Dan	Road			lownsnip					Lot		Conces	sion	
County/Dis	strict/Municip	pality				City/Town/Vil	lage	~				Provi Ont		Post	al Code
UTM Coord	dinates Zon	e Easting		lorthing		Municipal Pla	an and Subl	ot Nur	nber			Other		F.	111110
NAD Overburd	8 3 en and Be	drock Mater	ab 8	onment S	ealing Rece	ord (see instr	uctions on th	ne bacl	k of this for)			_		
General C	olour	Most Com	mon Materia	1	Ot	her Materials	1 1			Gener	al Description	1		De	pth (m/ft) To
bra	0	Sand			X				(de 1/12) 2000					Ø	11,
greu		Jeour	e			41 5								11,	65'
	3														
		Donal	sent	- DOCT.	to in	cluch	-05								-
		Sund) E	and	ic II'	I CULST	<u> </u>						10177		
													Andrews and		
Depth Se	et at (m/ft)		Annula Type of Se	r Space alant Used		Volume	Placed	Afte	er test of we	R ell vield, w	esults of W	ell Yie	d Testin	ig F	Recovery
From	To	21-1-1	(Material a	nd Type)		(m ³	³ /ft ³)		Clear and Other sp	d sand fre	e	Time (min)	Water Le	evel Time	Water Level
10	57	218 Y	de p	ilig ;				If pu	umping disc	continued.	, give reason:	Static	(/	(
59	105	Ad a	SIN(a	sand						1		1	/	1	
								Pun	np intake s	et at (m/ft)		2	/	2	
Meth	nod of Cor	struction			Well Us	e		Pum	nping rate	(I/min / GPI	M)	3	-	3	
	ol	Diamono		blic		rcial	Not used	Dur	ation of pu	mping		4		4	
Rotary (C	Reverse)			restock	Test Hol		Monitoring		hrs +	mii	י /	5		5	
Air percus	ssion			gation Iustrial		& Air Conditior	ning	Fina	I water lev	el end of p	oumping (m/ft)	10		10	
_] Other, sp	Con	struction R	ecord - Cas	ner, specity	the second s	Status	of Well	If flo	wing give r	ate (I/min/	GPM)	15	/	15	
Inside Diameter	Open Hole	OR Material	Wall	Dept	h (m/ft)	Water Si	upply	Rec	ommende	d pump de	epth (m/ft)	20	1	20	
(cm/in)	Concrete, F	Plastic, Steel)	(cm/in)	From	То	Test Hol	ment vveli e	Rec	ommende	d pump ra	te	25		25	
1.5"	PVL		025"	Ø	55'	Recharg	ie Well ing Well	(l/mi	n/GPM)		.0	30		30	
				-		Observa Monitorir	tion and/or ng Hole	Well	production	n (I/min/GF	M)	40		40	
						Alteration (Constru	n Iction)	Disin	nfected?			50		50	
	Con	struction R	ecord - Scr	oon	1	Abandor Insufficie	ned, ent Supply		Yes	No	Man of W/		ation	60	
Outside Diameter	Mat	terial	Slot No.	Dept	h (m/ft)	Water Q	ned, Poor uality	Plea	ise provide	e a map b	below followin	ig instru	uctions or	n the bacl	ς.
(cm/in)	(Plastic, Galv	anized, Steel)		From	То	specify	iea, otner,			11	m	2	$) \land$		
1.75	PVL		010	55'	65	Other, sp	becify		1	1	10	5	1)
		Water Det	alle						(1	//		10		/
later found	at Depth	Kind of Water	Fresh	Untested	Depti	n (m/ft)	Diameter		\	1	Wing)	\mathcal{A}		\sim	٨
(m/ Vater found	(ft) Gas at Depth	Other, spe	cify Fresh	Untested	From				1	12	0	11))(~ ~	11
(m/	(ft) Gas	Other, spe	cify			INE'	1411		() ¢	TPC		2A	Yor	中
Vater found	ft) Gas	Cind of Water	: [_]Fresh [cify	Untested			1	X	774	n.	HyduDin	71	I.	D	n
	We	Il Contracto	r and Well	Technicia	n Informati	on		1.1	0 -	12	Rd.	1	E	51	$\left\{ \right\}$
usiness Na	me of Well (Contractor	19 (DR	trata	X I	Contractor's	Licence No.	T	ix	U		/	h	N	X
usiness Ad	dress (Stree	t Number/Na	me)	TRUT	Mur	nicipality		Com	ments:		11				
rovince	Pos	stal Code	Business	E-mail Add	Iress	NUNTRY	, XIL	M	MMI,	unida	s-the-	107	1		
us.Telephor	ne No. (inc. a	rea code) Na	me of Well T		ast Name	(000		Well inform	owner's nation	Date Pack	kage Delivere	ł	Min Audit No	istry Use	Only
01132	15231	331	Filli	001	Scott	MIN		delive	age ered	Y Y Y Date Worl	Y M M I	D		41	4110
33	Ins Licence N	o. Signature	of lechniciar	n and/or Co	ntractor Date	Submitted	1/1000		No	RIVIS	RM M2	B	Received		
06E (2020/06) © Queen's	Printer for Onta	ri6 2020	0	C	Contract	or's Copy	V	1(ANCIN					

	Conse	rvation and	Parks	went	ag No. (Place Stick	er and/or Print Be	low) Regulat	ion 903	Ontario	Well	Reco
Measur	rements recorded in:	Metric	/ Imperial		A3860-	+1	rioguna	1011 300	Pa		of
Well C	Owner's Information	and the second second								90	
First Na	me nospin of	Last Name	Organizati	on	WEV C	E-mail A	dress			U Well	Construc
Mailing	Address (Street Number/N	Jame)	1111	unau	Municipality	Province	Postal C	ode	Tolonhou	by W	ell Owne
19	Kanpell St. r.	D.Box	180		Calabajie	ON	KIDIS	JHI		ne No. (inc.	. area coo
Address	ocation	lumbor/blome									
34	Hudio Dir	M R M	id		Township		Lot		Concess	sion	
County/[District/Municipality	I PUL	<u>v</u> . v.		City/Town/Village			Prov	ince	Posta	Codo
UTM Co	ordinates Zone Easting		A lowelly low		Calaboon	e		On	tario	X OI	21114
NAI	D 8 3 1 8 3 5 3	131696		15118	Municipal Plan and S	ublot Number		Othe	r		
Overbu	rden and Bedrock Mate	erials/Aband	Ionment §	sealing Rec	ord (see instructions o	n the back of this for	m)				
General	I Colour Most Col	mmon Materia	al	Ot	ther Materials		General Descript	on		Dep	th (m/ft)
Drau	nn (ubde	5		5	ind					Ø	31
DIA	un sund									21	25
DIDI	in wets	and								25'	20
aver	1 grant	e								321	55
,) E										2 3
	Imv	1 set	Unsi	ite							
											-
		Annular	Space				Results of	Vell Viel	d Testin		
Depth S From	Set at (m/ft)	Type of Sea (Material a)	alant Used		Volume Placed	After test of we	l yield, water was:	Dr	aw Down	Re	covery
(\mathcal{D})	411 315"	Chile of			<u>(m³/π³)</u>	Clear and Other, spe	sand free cify	Time (min)	Water Lev (m/ft)	vel Time V	Nater Le
411	551 47 0	NOA PU	ug			If pumping disc	ontinued, give reason	Static			(marty
11	72 70 7	2/11((1 <	ANA			_ \		1	/	1	
						Pump intake se	t at (m/ft)		/		
							1	-	<u> </u>	2	- 01
Met	thod of Construction			Well Us	e	Pumping rate (I/	min / GPM)	3		3	
Rotary ((Conventional)		olic mestic	Commer	rcial Not used	Duration of pum	ping	4		4	
] Rotary (] Boring	(Reverse) Driving		estock	Test Hold	e 🖉 Monitoring	hrs +	min X	5		5	
Air perci	ussion		ustrial		a Air Conditioning	Final water leve	end of pumping (m/f	^{t)} 10		10	
J Other, s	Construction F	Oth	ier, specify			If flowing give ra	te (I/min/GPM)	15		15	
Inside	Open Hole OR Material	Wall	Dept	h (m/ft)	Vater Supply	Recommended	pump donth (m/A)	20	/	20	
Diameter (cm/in)	(Galvanized, Fibreglass, Concrete, Plastic, Steel)	Thickness (cm/in)	From	То	Replacement Well	Recommended	ρυπρ αθρίη (π/π)	25	/		
5"	PIC	.25'	Ch	42'	Recharge Well	Recommended	oump rate	20		25	
	40		V.	10		(I/min/CDM)	partipitato	30	-/	25	
					Dewatering Well	(I/min/GPM)		30	/	25 30	
					Dewatering Well Observation and/or Monitoring Hole	Well production	(/min/GPM)	30 40		25 30 40	
					 Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) 	(I/min/GPM) Well production Disinfected?	(/min/GPM)	30 40 50		25 30 40 50	
					Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply	(I/min/GPM) Well production Disinfected?	(/min/GPM)	30 40 50 60		25 30 40 50 60	
Dutside	Construction R	ecord - Scre	en Doott	(m/ft)	Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality	(I/min/GPM) Well production Disinfected?	(/min/GPM) o Map of W	30 40 50 60	ation	25 30 40 50 60	
Dutside iameter cm/in)	Construction R Material (Plastic, Galvanized, Steel)	ecord - Scre Slot No.	en Depth From	1 (m/ft) To	Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, other, cossifiered	(I/min/GPM) Well production Disinfected? Yes N Please provide	(/min/GPM)	30 40 50 60	ation actions on t	25 30 40 50 60 the back.	
Dutside ameter cm/in)	Construction R Material (Plastic, Galvanized, Steel)	ecord - Scre Slot No.	en Depth From	n (m/ft) To	 Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, other, specify 	(I/min/GPM) Well production Disinfected? Yes N Please provide	(/min/GPM) o Map of W a map below follow	30 40 50 60 Well Loca	ation Inctions on the	25 30 40 50 60 the back.	1
Dutside ameter cm/in)	Construction R Material (Plastic, Galvanized, Steel)	ecord - Scre Slot No.	en Deptr From	(m/ft) To 50	 Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, other, specify Other, specify 	(I/min/GPM) Well production Disinfected? Yes N Please provide	Vmin/GPM)	30 40 50 60 7ell Loca	ation retions on t	25 30 40 50 60 the back.	4
Dutside iameter cm/in)	Construction R Material (Plastic, Galvanized, Steel)	ecord - Scre Slot No.	en Deptr From	1 (m/ft) To	Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, other, specify Other, specify	(I/min/GPM) Well production Disinfected? Yes N Please provide	(/min/GPM)	20 30 40 50 60 Well Locz	ation ctions on the second	25 30 40 50 60 the back.	4
Dutside iameter (cm/in) 25	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Kind of Water	ecord - Scre Slot No.	en Deptr From	n (m/ft) To 53 Ho Depth	Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, other, specify Other, specify	(I/min/GPM) Well production Disinfected? Yes N Please provide	Vmin/GPM)	30 40 50 60 7ell Loca	ation Inctions on	25 30 40 50 60 the back.	A
Dutside Diameter (cm/in)	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Kind of Water Vft) Gas Other, spe	ecord - Scre Slot No.	Deptr From	(m/ft) To 50 Ho Depth From	Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, other, specify Other, specify Other, specify	(I/min/GPM) Well production Disinfected? Yes N Please provide	(/min/GPM)	20 30 40 50 60 Vell Locz	ation ctions on the second	25 30 40 50 60 the back.	A
Outside Diameter (cm/in)	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Kind of Water M(t) Gas Other, spe d at Depth Kind of Water	ecord - Scre Slot No.	en Deptr From	r (m/ft) To 50 Ho Depth From	Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, other, specify Other, specify	(I/min/GPM) Well production Disinfected? Yes N Please provide	(/min/GPM)	20 30 40 50 60 ell Locz	ation Inctions on the	25 30 40 50 60 the back.	A
Dutside riameter (cm/in) ter found (m ter found (m ter found	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Kind of Water offt) Gas Other, spe d at Depth Kind of Water offt) Gas Other, spe d at Depth Kind of Water	ecord - Scre Slot No.	en Deptr From Untested	(m/ft) To 50 Ho Depth From 0 30	Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, other, specify Other, specify Other, specify Debiameter (m/ft) Diameter To (cm/in) So 4	(I/min/GPM) Well production Disinfected? Yes N Please provide	Vmin/GPM)	20 30 40 50 60 rell Loca ng instru	ation ictions on	25 30 40 50 60 the back.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Dutside iameter com/in) TS ter found (m ter found (m. er found (m.	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Vift) Gas d at Depth Kind of Water Vift) Gas Other, spe d at Depth Kind of Water Vift) Gas Other, spe d at Depth Kind of Water Vift) Gas Other, spe d at Depth Kind of Water Vift) Gas Other, spe	ecord - Scre Slot No.	Deptr From	(m/ft) To 50 Ho Depth From 0 30	Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, other, specify Other, specify	(I/min/GPM) Well production Disinfected? Yes N Please provide	(/min/GPM)	20 30 40 50 60 rell Locz	ation rotions on the second se	25 30 40 50 60 the back.	
Dutside iameter cm/in) TS ter found (m ter found (m. er found (m.	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Kind of Water u/ft) Gas Other, spe d at Depth Kind of Water U/ft) Gas	ecord - Scre Slot No.	En Deptr From	(m/ft) To 50 Ho Depth From 0 30	Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality Abandoned, other, specify Other, specify Other, specify Demater (m/ft) Diameter (cm/in) So 4	(I/min/GPM) Well production Disinfected? Yes N Please provide	Vmin/GPM)	20 30 40 50 60 rell Loca ng instru	ation ictions on	25 30 40 50 60 the back.	
Outside Diameter (cm/in) ter found (m ter found (m ter found (m	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Kind of Water Mind of Water Mi	ecord - Scre Slot No.	Pen Deptr From Untested Untested Untested	(m/ft) To 53 Hc Depth From 33	Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, lnsufficient Supply Abandoned, Poor Water Quality Abandoned, other, specify Other, specify	(I/min/GPM) Well production Disinfected? Yes N Please provide	(/min/GPM)	20 30 40 50 60 rell Locz	ation rotions on the second se	25 30 40 50 60 the back.	
Dutside Diameter (cm/in) ter found (m ter found (m iness Na	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Kind of Water u(ft) Gas Other, spe d at Depth Kind of Water u(ft) Gas Other, spe Well Contractor ame of Well Contractor	ecord - Scre Slot No. ails : Fresh cify : Fresh cify : Fresh cify : r and Well T that a free cify : r and Well T	en Deptr From	r (m/ft) To 50 Hc Depth From 0 30 1 Informatio Well 2 4 Muni		(I/min/GPM) Well production Disinfected? Yes N Please provide	Vmin/GPM)	20 30 40 50 60 fell Loca Ing instru	ation ictions on	25 30 40 50 60 the back.	
Outside Diameter (cm/in) ter found (m ter found (m ter found (m ter found (m ter found (m	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Kind of Water Mind of Water Mi	ecord - Scre Slot No.	Deptr From	Informatio		(I/min/GPM) Well production Disinfected? Yes N Please provide Comments:	Vmin/GPM)	20 30 40 50 60 rell Locz ing instru	ation cotions on the second se	25 30 40 50 60 the back.	
Dutside liameter (cm/in) ter found (m ter found (m iness Na iness Ad	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Kind of Water h(ft) Gas Other, spe d at Depth Kind of Water h(ft) Gas Other, spe Well Contractor ame of Well Contractor Horsa (Street Number/Na	ecord - Scre Slot No.	Pen Deptr From Untested Untested Untested	r (m/ft) To 500 Hc Depth From 300 Ninformatio Well Well A Muni Sess		(I/min/GPM) Well production Disinfected? Yes N Please provide Comments: Well owner's Do	Vmin/GPM)	20 30 40 50 60 fell Loca Ing instru	ation ictions on the second se	25 30 40 50 60 the back.	
Dutside iameter (cm/in) ter found (m ter found (m) ter found (m) te	Construction R Material Material (Plastic, Galvanized, Steel) (Plastic, Galvanized, Steel) Water Det Kind of Water d at Depth Kind of Water //ft) Gas Other, spe d at Depth Kind of Water //ft) Gas Other, spe d at Depth Kind of Water //ft) Gas Other, spe Well Contractor Otherse (Street Number/Na Postal Code ne No. (inc. area code) Nar	ecord - Scre Slot No.	Pen Deptr From Untested JUntested JUntested JUntested	Informatio		(I/min/GPM) Well production Disinfected? Yes N Please provide Comments: Well owner's Data information package	Winin/GPM)	d A	Ation Ictions on T	25 30 40 50 60 the back.	
Dutside liameter (cm/in) ter found (m ter found (m ter found (m ter found (m ter found (m ter found (m ter found (m ter found (m ter found (m) ter found (m)	Construction R Material (Plastic, Galvanized, Steel) Water Det d at Depth Kind of Water v(ft) Gas d at Depth Kind of Water v(ft) Gas Other, spe d at Depth Kind of Water v(ft) Gas Other, spe Well Contractor ddress (Street Number/Na Postal Code ne No. (inc. area code) Nar	ecord - Scre Slot No.	en Deptr From JUntested JUntested JUntested	Informatio		(I/min/GPM) Well production Disinfected? Yes N Please provide Please provide Comments: Well owner's information package delivered Da	Vmin/GPM)	d D D A	Ation Incitions on the second	25 30 40 50 60 the back.	
Dutside liameter (cm/in) ter found (m ter found (m))	Construction R Material Material (Plastic, Galvanized, Steel) (Plastic, Galvanized, Steel) Water Det Kind of Water d at Depth Kind of Water v/ft) Gas Other, spe d at Depth Kind of Water v/ft) Gas Other, spe d at Depth Kind of Water v/ft) Gas Other, spe Well Contractor Other, spe Idress (Street Number/Na Postal Code ne No. (inc. area code) Nar an's Licence No. Signature of	ecord - Scre Slot No.	Pen Deptr From Untested JUntested JUntested JUntested	Informatio		(I/min/GPM) Well production Disinfected? Yes N Please provide Comments: Well owner's information package delivered Yes No	Vmin/GPM) 0 Map of M a map below follow Image: Second secon	d d	Ation rotions on the second se	25 30 40 50 60 the back.	



Jp2g No. 22-6213A

December 29, 2023

Ministry of the Environment, Conservation and Parks 2430 Don Reid Drive Ottawa, ON K1H 1E1

Attention: Thandeka Ponalo Sr. Environmental Officer

Re: Black Donald Landfill Site Township of Greater Madawaska ECA No. A411902 Expansion Feasibility Study

Dear Thandeka:

In order to finalize a 2024 work plan and budget we request further MECP review to support an application to Amend the ECA for an additional <40,000m³ landfilling capacity proposed for 2024.

Relevant copies of documentation are included in **Appendix 1**:

- October 25, 2022 Jp2g Feasibility Assessment
- January 6, 2023 TSS Groundwater Alija Bos
- January 11, 2023 TSS Surface Water Mark Phillips
- January 25, 2023 Jp2g Response

The purpose of this submission is to provide an update on the tasks completed in 2023 to address the issues identified by TSS. The proposed expansion of the landfilling area is illustrated on **Drawing 1**.

Monitoring Well Installations

On October 30 and 31, 2023 additional monitoring wells were installed as shown on **Figure 1**, copies of the well records are included in **Appendix 2**.

- BR23-85 (shallow) and BR23-8D (deep) installed between landfilling area and MW08-7
- MW23-7D installed near MW08-7S installed in the deep overburden
- BH-3 was located but it had been destroyed, a replacement well wasn't installed as the MW23-8 nest was located close by and out of the landfilling area expansion

Expanded Monitoring Program

The 2023 groundwater monitoring program involved the more comprehensive laboratory analysis of parameters listed in Schedule 5 Column 1 of the Landfilling Standards (1998) as agreed to by MECP.



Ottawa 1150 Morrison Dr., #410 Ottawa, ON, K2H 8S9 T: 613-828-7800 Ottawa@jp2g.com Pembroke 12 International Dr. Pembroke, ON, K8A 6W5 T: 613-735-2507 Pembroke@jp2g.com **Arnprior** 16 Edward St. S., #211 Arnprior, ON, K7S 3W4 T: 613-626-0780 Arnprior@jp2g.com



Reduced Monitoring Program

The 2023 surface water monitoring program included SW4 and SW5 as agreed to by MECP. Based on Jp2g site reconnaissance and field survey of the proposed expansion area on April 18, 2023 and other site visits, there are no permanent watercourses where surface water flow may occur from the landfilling area. There is a natural depression feature at the northwestern corner of the existing landfilling area, however no intermittent flow was observed. Similarly, no flowing water was observed in the ditch along Hydro Dam Road.

Monitoring Stations at Sewage Works Outlets

The feasibility of a sewage works outlet at the northwestern corner of the fill area will be confirmed as part of the detailed design.

Outlet Flow Paths

Additional field survey will be conducted to identify any flow paths from any sewage work outlet.

Stormwater Design

Pending results of additional site survey future monitoring of the flow paths from the sewage works will be provided.

Yours truly, Jp2g Consultants Inc. ENGINEERS • PLANNERS • PROJECT MANAGERS

Kevin Mooder, MCIP RPP Principal | Environmental Services

Encls.

cc. Leonard Emond, Facilities Manager



DWG NAME: J:\6-ENVIRONMENTAL\ACTIVE\2022\22-6213A - GREATER MADAWASKA WDS\DRAWINGS\BLACK DONALD\CAD FILES\EXISTING CONDITIONS QS BEST VERSION 2023 WITH EXPANSION.DWG LAYOUT: EXPANDSION FEASIBILITY STUDY SAVED ON January 2, 2024



Vegetation

Property Line

Expansion area





DRAFTED: QS		PROJECT No.:	22-6213A
CHECKED: KM		REVISION DATE:	2023-12-20
CHECKED: KM	APPROVED: KM	REVISION No.:	
SCALE: 1:1000		SHEET No.:	1 of 1



Jp2g Consultants Inc. Engineers · Planners · Project Managers

12 INTERNATIONAL DRIVE, PEMBROKE, ON Phone: (613)735-2507, Fax:(613)735-4513 1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON Phone: (613)828-7800, Fax: (613)828-2600

Black Donald Landfill Site - Greater Madawaska

Monitoring Locations with Site Property Limit

DWG NAME: J:16-ENVIRONMENTAL/ACTIVE/2022/22-6213A - GREATER MADAWASKA WDS/DRAWINGS/BLACK DONALD/CAD FILES/EXISTING CONDITIONS QS BEST VERSION 2023 WITH EXPANSION.DWG LAYOUT: NEW WELL AERIAL SAVED ON January 2, 2024

DRAFTED: QS		PROJECT No.:	22-6213A
CHECKED: KM	I	REVISION DATE:	2023-12-20
CHECKED: KM	APPROVED: KM	REVISION No.:	
SCALE: 1:9028		SHEET No.:	1 of 1

APPENDIX 1



Jp2g No. 22-6213A

October 25, 2022

Ministry of the Environment, Conservation and Parks 2430 Don Reid Drive Ottawa, ON K1H 1E1

- Attention: Thandeka Ponalo Sr. Environmental Officer
- Re: Black Donald Landfill Site Township of Greater Madawaska ECA No. A411902 Expansion Feasibility Study

Dear Thandeka:

On behalf of the Township of Greater Madawaska, we are pleased to provide this feasibility assessment regarding the potential for an expansion at the Black Donald Landfill Site. This report provides the preliminary steps to obtain approval for an expansion and is intended to provide the Township with a foundation for waste management decision making pending Ministry comments.

1.0 INTRODUCTION

The Black Donald Landfill Site located on part of Lot 9, Concession 2 and 3, geographic Township of Brougham in the Township of Greater Madawaska, Ontario, currently operates under ECA No. A411902 issued March 27, 1980, as amended which is included in **Attachment 1**. The following provides the additional Notices issued under the ECA:

Notice No. 1 October 22, 2001	Amended to reflect the increase in site service area to include the Township of Greater Madawaska.
Notice No. 2 July 12, 2002	Amendment to include the submission of the development and operations report as per Condition 14.
Notice No. 3 January 24, 2013	Amended to reflect site operations, approval of alternate daily cover and Site Trigger and Contingency Plan.

The environmental monitoring compliance program is based on the ECA Schedule "B" dated January 24, 2013. Operations compliance is based on a Design, Operations and Development Plan by Greenview Environmental Management, dated December 22, 2010 (Greenview, 2010).



Ottawa 1150 Morrison Dr., #410 Ottawa, ON, K2H 8S9 T: 613-828-7800 Ottawa@jp2g.com Pembroke 12 International Dr. Pembroke, ON, K8A 6W5 T: 613-735-2507 Pembroke@jp2g.com **Arnprior** 16 Edward St. S., #53B Arnprior, ON, K7S 3W4 T: 613-828-7800 Arnprior@jp2g.com



2.0 LANDFILLING CAPACITY

The following has been compiled from various sources to estimate the total approved waste disposal volume and the remaining landfilling capacity. Recent Greenview documents have stated the current volume in place is unknown.

2.1 Total Design Capacity

Under ECA Notice No. 2 dated July 12, 2002 the Site Development And Operations Plan by Jp2g Consultants Inc. dated January 2001 (Jp2g, 2001) as item 4 in Schedule "A" provided the following site capacity figures:

- theoretical maximum capacity of a 1.2 ha site to a pyramidal peak 54,200m³
- preliminary design capacity of a 0.9 ha landfilling area with a 30m buffer along the Township road 25,550m³
- detailed design capacity of 34,250m³ (excluding final cover) with a remaining capacity of 29,350m³ as of January 1, 2001
- the total landfilled in place volume was approximately 4900m³ as of January 1, 2001

The ECA Condition (18) dated July 12, 2002 stated the total capacity including final cover is 46,785m³

2.2 Remaining Capacity

The Preliminary Landfill Expansion Feasibility Studies prepared by Greenview dated August 31, 2007 (Greenview, 2007) cited two (2) remaining capacities.

- As of October 27, 2006 (Golder, 2007) there was an estimated 22,300m³, excluding final cover, remaining capacity.
- Using the revised final contours to accommodate the proposed waste transfer station as presented in the proposed 2007 application to amend the ECA, the remaining capacity was approximately 8,400m³.

The latter was not implemented, as the Black Donald Site was not selected as one of the waste transfer sites.

Under ECA Notice No. 3 dated January 13, 2013 the Design, Operations And Development Plan (Greenview, 2010) as item 7 in Schedule "A" provided the following remaining capacity figures:

- remaining capacity as of October 20, 2009 is 14,926m³
- remaining capacity as of November 2, 2010 is 12,442m³

As of December 14, 2021 the remaining capacity was 4400m³ (Greenview, 2022). The life expectancy could be 2 to 5 years depending on the annual landfilling rate. Based on the annual surveys completed to determine the annual landfilling rate and remaining capacity, the following summarizes the results based on available reports in the Township records.



Year	Annual	Remaining	Estimated Years	Waste Summary
	Landfilled (m3)	Capacity (m3)		
2009	4909	14,926	3	2393 cars 2494 trucks 1145 trailers 27 single axle 11 tandem 16 tri-axle
2010	2484	12,442	5	690 cars 505 trucks 67 trailers 4 single axle 3 tandem 4 tri-axle
2011	11,341			
2012	1087 with cover	10,337	9	33 tri-axles 1 trailer
2013	1197	9140	7.6	28 tri-axles 4 trailers
2014				
2015	256	9320	9	12 tri-axles 1 bin
2016	382	8937	10	3 bins 510m ³
2017				
2018				
2019				
2020	759	6478	12	25 tri-axles 2 bins 410m ³
2021	2078	4400	5	52 tri-axles 786m ³

3.0 LEGISLATIVE REQUIREMENTS

Under Ontario Regulation 101/07, made under the EA Act, a proponent may increase the capacity by 40,000m³ or more but not more than 100,000m³ subject to fulfilling the Environmental Screening Process (ESP). A change of less than 40,000m³ is exempt from the EA Act.

Approvals for changes to waste disposal sites is obtained under Part V of the Environmental Protection Act (EPA) and reviewed under the Environmental Compliance Approval (ECA) process. Under the Ministry's Requirement for Fees with ECA's (formerly O.Reg 363/98 Section 27 EPA) the province applies fees to review applications.

The July 2020 amendments to the EA Act are proposing changes to O.Reg 101/07 under a new regulation, but not to the above approvals process.



To include the approved total waste disposal volume of 46,785m³ which includes final cover (Note O.Reg 232/98 defines total waste disposal volume without final cover) by <100,000m³ the ESP is intended to identify potential environmental effects, concerns and/or issues to be addressed through a phased investigation and consultation process.

Greenview (2007) completed a preliminary landfill expansion feasibility study which included a review of natural heritage features, cultural heritage features and physical environmental features. The report included an Initial Environmental Impact Study by Snider's Ecological Services to assess significant natural features including threatened and endangered species habitat. Additional studies were recommended. The report also included a Stage 1 Archaeological and Cultural Heritage Assessment by The Central Archaeological Group for C.R. Murphy Archaeology. It was determined the potential for significant archaeological sites was low. The scope of work to support an ESP would be much more extensive and requires agency review and comment. In our experience an ESP would cost in the order of \$100,000 to \$200,000 and take approximately 5 years to complete. This cost range depends on the requirements to enhance the current landfill site monitoring program. The Greenview report identified topographical constraints which will limit the expansion of the current landfilling area south and east while maintaining the existing buffers from the Hydro Transmission line and Hydro Dam Road. An expansion to increase the total waste disposal volume by <40,000m³ maybe acceptable as shown on **Drawing No 1**.

To determine the feasibility of expansion <40,000m³, pre-submission consultation with the MECP Ottawa District Office and MECP Technical Support Section (TSS) Regional Office is required prior to the application. This letter combined with the recent Annual Report is anticipated to facilitate this review.

4.0 BLACK DONALD LANDFILL SITE ASSESSMENT

In order to assess the feasibility of a successful expansion application three (3) main issues need to be considered in consultation with the Ministry.

<u>Legal</u> – the status of the ECA, the adequacy of the landholdings and the municipality's compliance with the conditions.

- correct description of the site defining the landfilling area and total site
- correct legal survey or description of the site
- adequate contaminant attenuation zone (CAZ)
- outstanding ECA conditions to be satisfied
- submissions to satisfy a condition requiring Ministry review and approval

<u>Environmental</u> – the status of the water quality and landfill gas monitoring program and any measured or potential impacts on the surface and groundwater, and the potential impact to other natural environmental features.

- groundwater quality impacts
- surface water quality impacts
- adequacy of surface water flow control/stormwater management
- adequacy of the landfill gas monitoring program
- proximity to environmentally sensitive areas (ESA)
- potential impact on rare or endangered species and habitat (SAR)
- outstanding actions to address any Ministry Technical Support Section (TSS) review comments



<u>Operations</u> – the status of site operations and the potential impact on adjacent land uses and the local community.

- any record of negative effects on-site or on adjacent land uses, i.e. litter, dust, noise, odour, landfill gas
- any record of operational concerns
- outstanding actions to address Ministry inspection reports
- outstanding ECA Conditions to be satisfied

4.1 Legal

The ECA No. A411902 last amended January 24, 2013 describes the Site as a 1.2 hectare waste disposal site. ECA Section (2) 2.12 defines the Site as 'the entire waste disposal site including the landfilling area and the buffer lands as listed in Schedule "A" of the Certificate and consisting of approximately 1.2 hectare landfill site'. Upon review of the documents in Schedule "A" the Site comprises a 0.9m landfilling area within a total site area of 27.2 ha.

ECA Condition (33) required that a Certificate of Prohibition be registered on title. Based on available records it was registered on lands located in Part of Lot 9, Concession 2 and 3, Brougham, being Parts 1 to 4 Plan 49R-15646. As detailed in Section 4.2 the current operation has an adequate CAZ which should be satisfactory for a modest sized expansion. In Section 4.2 and 4.3 it is noted there are no ECA Conditions outstanding regarding environmental monitoring or site operations respectively.

4.2 Environmental

The monitoring program approved under the current ECA is to satisfy Condition 27. The monitoring program as detailed in ECA Schedule "B" consists of the bi-annual collection of static water levels and groundwater samples from seven (7) monitoring wells, and surface water samples collected three times per year from four (4) locations. The following provides an overview of the Environmental Monitoring program based on the work activities and laboratory data from the 2021 Monitoring period.

<u>Overview</u>

For the purpose of this submission, we have included the figures from the 2021 Annual Report by Greenview (2022) in **Attachment 2** and Borehole Logs in **Attachment 3**. The groundwater configuration at the site in 2021 was consistent with historical interpretations with an east-west oriented groundwater divide evident in the vicinity of the waste mound, and predominant groundwater flow directions to the east, west, and southeast as shown on Figures 4 and 5 in **Attachment 2**. Additionally, groundwater in the vicinity of the monitoring well MW08-6 was interpreted to flow to the east.

Groundwater immediately downgradient from the site at monitoring wells BH1, BH3, and BH4 was interpreted to be impacted from landfill-related activities in 2021. Most parameter concentrations were above median background groundwater quality results, with non-conformances of ODWS for concentrations of alkalinity, DOC, hardness, iron, manganese, and TDS noted at select monitors. The generally lower parameter concentrations at monitoring well BH3 compared to those at monitoring wells BH1 and BH4 were attributed to its location partially cross-gradient to the waste mound and along the groundwater divide at the site. Results from monitoring well BH1 were interpreted to be most representative of leachate quality at the Black Donald site at this time.



No RUC non-conformances were documented in results from downgradient monitoring well MW08-7 in 2021 that were attributed to landfill-related factors. The noted RUC non-conformance in fall 2021 at MW08-7 for DOC was consistent with DOC concentrations observed in background wells BH2 and MW08-6. Based on the above, the Black Donald site was interpreted to meet the intent of MECP Guideline B-7 at the downgradient eastern CAZ boundary in 2021. Based on 2021 results, it was extrapolated that given the considerable distance of BH4 to the downgradient southwestern CAZ boundary (approximately 170 m), and naturally-occurring concentrations of alkalinity, aluminum, DOC, hardness, manganese, and TDS in the background (BH2 and MW08-6), the Black Donald site was interpreted to meet the intent of MECP Guideline B-7 and was interpreted to be in compliance with RUC in 2021 at the southwestern CAZ boundary.

Based on the surface water quality results in 2021, and the significant distance of each sampling location from the Black Donald site, the surface water systems south and southeast of the Black Donald site were not interpreted to be impacted from landfill-related activities. Non-conformances of PWQO for concentrations of DO (low), phosphorus, iron and zinc noted in 2021 at select sampling locations for select sampling dates were attributed to naturally occurring conditions in the background (SW-4), as well as to low-flow surface water conditions.

In 2021, PWQO non-conformances at key trigger locations SW-3 and SW-6 for concentrations of iron were attributed to low water/ low-flow conditions, and not to landfill-related activities. Similarly, PWQO non-conformances for concentrations of phosphorus at key trigger location SW-3 were generally consistent with concentrations observed at background location SW-4 and were therefore not attributed to landfill-related factors. No RUC non-conformances were noted for any of the key trigger parameters at key trigger location MW08-7 following inclusion of 2021 results. Based on a review of five (5) year time trend analysis for parameters un-ionized ammonia, barium, boron, chloride, chromium, COD, iron, nitrate, sodium, sulphate, TKN and total phosphorus, the Trigger Mechanism was not interpreted to be activated in 2021.

Part of the feasibility study for the landfill expansion has included a critical review of the monitoring program including:

- enhancement of the groundwater quality sampling with the potential for further delineation of the leachate plume in the overburden and bedrock aquifers
- modify the surface water program by enhancing the sampling and review locations at a significant distance from the fill area

It is anticipated that a proposed expansion will not impact Environmentally Sensitive Areas (ESA) or Species At Risk (SAR), or their habitat as the expansion of the landfilling area is immediately adjacent to the operating fill area.

Revised Groundwater Monitoring Program

The existing monitoring program was reviewed to assess groundwater and quality and locations, and where feasible bolster the program to accurately address necessary impacts from the landfill. **Attachment 4** indicates the existing, and proposed revision of the monitoring program. As shown, monitoring wells are to be sampled on an annual basis for the full set of parameters as per Schedule 5 Column 1 of the Landfill Standards (1998). This increase in parameters will help establish a more comprehensive data set for the boundary compliance wells, to compare with the background and leachate wells.



The updated program will continue to sample the monitoring wells as per ECA Schedule "B", with the proposed addition of the following as shown on **Drawing No 2** (a Greenview base plan)

- one (1) bi-level monitoring well within the overburden (if available) and bedrock aquifers east of the landfilling area to further delineate the plume within the groundwater towards MW08-7;
- compliance well MW08-7 is installed in the overburden (sand material), see borehole log in Attachment 3, therefore it is recommended to also install a bedrock monitoring well in this location to delineate leachate in the bedrock aquifer in this direction; and
- monitoring well BH3 was destroyed in 2021 due to landfilling activities; this well should be reinstated to aid in assessing leachate migration south of the fill area.

The water quality analysis to be expanded to Schedule 5 Column 1 of the Landfill Standards (1988). Upon installation and sampling it is further recommended to update the trigger mechanism and contingency plan to reflect a proposed expansion.

Revised Surface Water Monitoring Program

The original program included surface water monitoring locations SW-1, SW-2, SW-4, SW-4, SW-5 and SW-7. SW-4 was relocated and represents background surface water quality at the site. In 2009 the Ministry agreed to remove SW-1, SW-2 and SW-7 from the monitoring program as they were typically observed to be dry. In the 2015 Annual Report the Township requested that surface water sampling be deleted from the monitoring program. The MECP letter dated July 7, 2016 reiterated that it should continue. Locations SW-3 and SW-6 are located a significant distance from the landfilling area as shown on **Figure 3** in **Attachment 2** and could be removed from the program.

Upon completion of a more detailed topographic survey and review of surface water drainage from the expanded landfilling area, additional sampling locations may be considered. The proposed analysis is to be expanded to Schedule 5 Column 3 of the Landfill Standards (1998).

To establish a more comprehensive water quality data base, in accordance with ECA Condition 28 we request District Manager approval to alter the groundwater and surface water monitoring program as shown in **Attachment 4**.

4.3 Operational

Landfilling at the Black Donald WDS initially involved a trench, burn and cover operation in the 1970s. Based on a test pit program conducted in 1998 a landfilling area of approximately 0.4ha was identified within the 1.2 ha site and an estimated in place waste volume of 4400m³. A copy of the plan is included in **Attachment 5**. The base elevations were developed from an assumed elevation.

At the time of the 2001 application to amend the Certificate an estimated in place volume of 4900m³ was stated. The Site Development and Operations Plan, January 2001 presented a design with final contours providing a remaining capacity of 34,250 m³ excluding final cover. A copy of the 2001 design drawings are included in **Attachment 5**.



Landfilling operations included an area method of landfilling over the former waste disposal area and towards Hydro Dam Road within the limits of a 0.9 ha landfilling area which applied a 30m buffer from Hydro Dam Road and a 15m buffer from the Hydro One easement limit.

On April 5, 2010 the Black Donald site was closed to the public for waste and recycling operations. The Greenview Design, Operations and Development Plan, December 2010 design utilized the Jp2g concept and detailed a five (5) staged approach for landfilling. A copy of the 2010 Stage 5 drawing up to final contours without final cover is included in **Attachment 5**.

Landfilling Operations

The Greenview 2010 report details the current landfilling procedures. The site is approved to receive leaf and yard waste, bulky and construction & demolition (C&D) waste from municipal vehicles and Township approved haulers only, under the supervision of Township staff. The bulky and C&D waste is stockpiled on the active landfilling area and is ground by a licensed contractor for use as an alternative cover material source as per ECA Conditions 16(a) and 35(a) and (b). ECA Conditions 16(b) and (c) permit the Site to receive non-hazardous solid domestic waste on a temporary basis, i.e. in the event waste from the transfer stations cannot be received elsewhere.

Waste Diversion

There is no curb side collection of household waste and recyclables in the Township unless contracted directly by a homeowner or business. Currently waste received at the three (3) waste transfer sites are hauled to Moose Creek for disposal. Blue box recyclables are transferred to Emterra in Renfrew, cardboard is hauled to OVWRC near Pembroke. Other recyclable materials are picked up be licenced haulers. Household hazardous waste is accepted at the Renfrew Landfill Site facility.

ECA Operations Review

All waste deliveries to the Site are inspected by trained municipal employees and records maintained of the waste disposal operations. The following ECA conditions are being satisfied.

- 15 (a) The Owner shall develop the Site in accordance with the Site Design, Operations and Development Plan, dated December 22, 2010, item 7 of Schedule "A".
 - (b) The Site shall be constructed, operated and maintained in an environmentally safe manner, which minimizes the impacts of dust, odour, noise, litter, vector and vermin on the general public, Site personnel, and the natural environment.
- All incoming waste shall be inspected prior to being received at the Site to ensure that the Site is approved to accept such a waste.
- 21 The Owner shall ensure that all wastes at the Site are managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.
- 22 The Owner shall maintain records of the results of all inspections and monitoring and a summary of all activities associated with the Site (e.g., spills, maintenance work) in a record book located at the Site.



- 23 The Owner shall conduct weekly inspections of the equipment and facilities at the Site to ensure that they are maintained in good working condition at all times. Any deficiencies, which might negatively impact the environment, detected during these inspections shall be recorded in a log, and promptly corrected.
- 24 (a) A sign shall be posted in a prominent location at the entrance at the Site stating the hours of operation, the Owner's name, staff contact and telephone to all in the event of an emergency or any complaints.
 - (b) Complaints received from the public or adjacent neighbours shall be recorded in a logbook created and maintained for this purpose.
- 25 (a) The Owner shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation at this Site.
 - (b) All spills and upsets shall be immediately reported to the Ottawa District Office or the Ministry's Spills Action Centre at 416.325.300 or 1.800.268.6060, and the Municipality, and shall be recorded in a logbook as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences.
 - (c) All waste material from a spill or process upset, shall be managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.
- 35 (a) The Owner shall ensure that only Ministry-approved contractors carry out the processing of the Construction and Demolition and Bulky Waste at the Site.
 - (b) The Owner shall ensure that Construction and Demolition and Bulky Waste is stored and processing within the landfill footprint, as shown in Figure 6, Proposed Site Design, of item 7 of Schedule "A".
- 36 (a) The Owner shall ensure that leaf and yard storage and composting is conducted as described in the Site Design, Operations and Development Plan, item 7 of Schedule "A".
 - (b) A maximum of 1000 cubic meters of leaf and yard waste may be temporarily stored within the staging area.
 - (c) Leaf and yard wastes shall be moved to the established composting area within the three months of arrival at the Site.
 - (d) A maximum of 500 cubic meters of leaf and yard may be processed within the composting area at any time.
- 37 (a) The Owner shall ensure that cover material is applied at the Site as follows:
 - Intermediate Once every six (6) months, across the entire working face, and/or in areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 0.3 meters of soil or an approved thickness of alternative cover material shall be placed.
 - Final In areas where landfilling has been completed to final contours, a minimum of 0.6 meters thick layer of final cover soil shall be placed, followed by a 0.15 meter of topsoil.



- (b) In the event that domestic waste is received at the Site on a temporary basis, daily cover shall be applied, at the end of each working day, followed by 0.15 meters of soil.
- (c) The Owner may apply the following materials as alternative intermediate cover, in the same thicknesses as described in Condition 37(a):
 - leaf and yard waste mixed with soil cover and/or wood chips
 - composted or partially-composted leaf and yard waste
 - asphalt shingles
 - clean wood chips
 - contaminated soil, non-hazardous
 - processed C&D and bulky waste materials

Ministry Site Inspections

-

_

According to Township records a site inspection was completed May 26, 2015. A site inspection report dated July 6, 2015 requested the following:

- 1. Weekly inspections as per Condition 23 of the ECA.
- 2. Records of inspections as per Condition 22 of the ECA
- 3. Signage to be improved as per Condition 24(a) of the ECA
- 4. Access by unauthorized person is prevented by better fencing as per Section 11(6) of the O.Reg 347 of the EPA.

In reference to the 2021 Annual Report (Greenview, 2022) the Township received a site inspection report dated October 9, 2019. The report includes the following action items:

- 1. Township shall begin keeping weekly record of the equipment and facilities at the Site as per Condition 23 of the ECA
- 2. Recommend posting a No Dumping sign at the entrance and take further steps to prevent dumping as required by Section 11(16) of O.Reg 347

An Action Plan was filed by Greenview dated November 25, 2019. The Township submitted photos of the signage on February 14, 2020.

Jp2g Site Review

Jp2g conducted a site inspection on September 16 and 29, 2022 to review current operations and assess the feasibility of an expansion to the landfilling area. All signage was in good condition and the gate was locked. The access road to the fill area was in satisfactory condition. A large stockpile of unprocessed bulky and C&D waste was deposited on the waste mound, the ground waste has been spread and there was little wind-blown litter. Areas of the waste mound had received earth/granular material final cover and some slopes were fairly steep. Overall, the waste mound needed re-grading to achieve the 4:1 side slopes and final contours where landfilling was completed.



5.0 EXPANSION PROPOSAL

The existing landfilling area is located on a topographic bedrock high with slopes southeast and east. Overburden is characterized by a fine to medium sand of approximately 0.3 to 1.5m in thickness with local bedrock outcropping near the fill area. MW08-7 located to the east on the opposite side of Hydro Dam Road has over 8m of overburden thickness.

Based on groundwater elevation measurements over the past 20 years there is a shallow groundwater flow to the east, west and southwest which is generally consistent with the slope of the ground topography.

MW08-6 is considered the background well installed on Crown Land on the opposite side of the Hydro transmission line. BH1 is located approximately 25m east and downgradient of the fill area and the water quality is characterized by elevated concentrations of landfill leachate parameters. Given the proximity to Hydro Dam Road, road salting may also be a factor.

A RUC assessment was completed at MW08-7 which is located to the southeast of the fill area and 180m southeast of BH1 at the easterly limit of the CAZ. No RUC exceedances were documented, as the elevated DOC concentration was also detected in the background well.

In support of the proposed expansion, we propose the installation of additional overburden and bedrock monitoring wells. Water quality analysis to be expanded to Schedule 5 Column 1 of the Landfill Standards. We propose to maintain the current surface water sampling locations SW-4 (background) and SW-5 and expand the analysis to include the parameters in Schedule 5 Column 3 of the Landfill Standards. Upon further detailed topographic survey of the expansion area additional locations may be identified.

Due to the Hydro transmission line and Hydro Dam Road the expansion of the fill area is limited to the south and southeast. **Drawing No. 1** illustrates a conceptual expansion which could add another 30,000 to <40,000m³ of waste disposal capacity. The final design requirements for the proposed expansion will require additional field elevation survey.



We trust this summary is satisfactory and will be considered by the Ottawa District Office and TSS in their review of the latest Annual Report. Should you have any questions please do not hesitate to contact the undersigned.

Yours very truly, Jp2g Consultants Inc. Engineers • Planners • Project Managers

Kevin Mooder, MCIP, RPP Principal I Environmental Services

Andrea Sare, C.Tech, EP. Environmental Consultant

Halren Bopp

Andrew Buzza, P.Geo Sr. Hydrogeologist

KM/AS/AB/jlp

cc Leonard Emon Facilities Manager

Drawings





Black Donald - Greater Madawaska

12 INTERNATIONAL DRIVE, PEMBROKE, ON 1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON Phone: (613)735-2507, Fax:(613)735-4513 Phone: (613)828-7800, Fax: (613)828-2600

Expansion design and designed Phase 5

DWG NAME: J:\6-ENVIRONMENTAL\ACTIVE\2022\22-6213A - GREATER MADAWASKA WDS\DRAWINGS\BLACK DONALD\CAD FILES\EXPANSION 2022 FEASIBLE.DWG LAYOUT: PHASE 5 + EXPANSIONS SAVED ON October 21, 2022

		1:1 000 20 30 1:1	40 50 m	
DRAFTED: QS		PROJECT No.:	22-6213A	1
CHECKED: KM CHECKED: KM	APPROVED: KM	REVISION DATE: REVISION No.:	2022-10-11	$\left \right $
 SCALE: 1:1000		SHEET No.:	1 of 1	


Attachment 1 ECA

Ontario

Ministry of the Environment Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A411902 Notice No. 3 Issue Date: January 24, 2013

The Corporation of the Township of Greater Madawaska 1101 Francis St Post Office Box, No. 180 Greater Madawaska, Ontario K0J 1H0



Site Location: Black Donald Waste Disposal Site 34 Hydro Dam Rd Greater Madawaska Township, County of Renfrew

You are hereby notified that I have amended Approval No. A411902 issued on March 27, 1980, and amended on October 12, 2001 and July 12, 2002 for the use and operation of a 1.2 hectare waste disposal site, as follows:

This Notice of Amendment updates the Approval to reflect current site operations, approves alternative daily cover and the Site Trigger and Contingency Plan.

The following definitions are added:

"Approval" means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A".

"Construction and Demolition and Bulky Waste" or "C&D waste" means wastes resulting from construction, and includes the following: asphalt shingles, mattresses, furniture, carpet, tree stumps, drywall, wallboard, wood (painted and unpainted).

The following Conditions are revoked and replaced:

- (15) (a) The Owner shall develop the Site in accordance with the Site Design, Operations and Development Plan, dated December 22, 2010, item 7 of Schedule "A".
 - (b) The Site shall be constructed, operated and maintained in an environmentally safe manner, which minimizes the impacts of dust, odour, noise, litter, vector and vermin on the general public, Site

Page 1 - NUMBER A411902

personnel, and the natural environment.

- (16) (a) The Site shall only receive only non-hazardous solid Construction and Demolition and Bulky Waste, and leaf and yard waste, generated from within the Township of Greater Madawaska.
 - (b) The Site may receive non-hazardous solid domestic waste from within the Township of Greater Madawaska, on a temporary basis, only with prior written authorization from the District Manager.
 - (c) Prior notification of 48-hours must be provided to the District Manager for receipt of any domestic waste.
- (23) The Owner shall conduct weekly inspections of the equipment and facilities at the Site to ensure that they are maintained in good working condition at all times. Any deficiencies, which might negatively impact the environment, which are detected during these inspections shall be recorded in a log, and promptly corrected.
- (26) The Owner shall implement the Site surfacewater and groundwater monitoring program as described in Schedule "B" of this Approval.

Site Trigger and Contingency Plan

(29) The Owner shall establish the surfacewater and groundwater trigger and contingency plan, as described in Section 6.2 of the Design, Development and Operations Plan, item 7 of Schedule "A".

The following Conditions are added:

Waste Processing

- (35) (a) The Owner shall ensure that only Ministry-approved contractors carry out the processing of the Construction and Demolition and Bulky Waste at the Site.
 - (b) The Owner shall ensure that Construction and Demolition and Bulky Waste is stored and processed within the landfill footprint, as shown in Figure 6, Proposed Site Design, of item 7 of Schedule "A".

Leaf and Yard

- (36) (a) The Owner shall ensure that leaf and yard storage and composting is conducted as described in the Site Design, Operations and Development Plan, item 7 of Schedule "A".
 - (b) A maximum of 1000 cubic metres of leaf and yard waste may be temporarily stored within the staging area.
 - (c) Leaf and yard wastes shall be moved to the established composting area within three months of arrival

Page 2 - NUMBER A411902

at the Site.

- (d) A maximum of 500 cubic metres of leaf and yard waste may be processed within the composting area at any time.
- (d) Composted leaf and yard waste may only be used as alternative daily cover at the Site, it may not be re-used by the public.

Cover

- (37)(a) The Owner shall ensure that cover material is applied at the Site as follows:
- Intermediate Once every six (6) months, across the entire working face, and/or in areas where landfilling
 has been temporarily discontinued for six (6) months or more, a minimum thickness of 0.3 metre of soil or
 an approved thickness of alternative cover material shall be placed; and
- Final -In areas where landfilling has been completed to final contours, a minimum of 0.6 metre thick layer of final cover soil shall be placed, followed by 0.15 metre of topsoil.
 - (b) In the event that domestic waste is received at the Site on a temporary basis, daily cover shall be applied, at the end of each working day, consisting of a minimum of 0.15 m of soil.

Alternative Daily Cover

- (c) The Owner may apply the following materials as alternative intermediate cover, in the same thicknesses as described in Condition 37 (a):
 - leaf and yard waste mixed with soil cover and/or wood chips;
 - composted or partially-composted leaf and yard waste;
 - asphalt shingles;
 - clean wood chips;
 - contaminated soil non-hazardous;
 - processed C&D and bulky waste materials.

Page 3 - NUMBER A411902

Schedule "A"

The following items are added to Schedule "A".

- Report entitled "Design, Operations and Development Plan, Black Donald Waste Disposal Site (A411902), Township of Greater Madawaska, County of Renfrew, Ontario", prepared by Greenview Environmental Management Limited, dated December 22, 2010.
- Letter dated July 30, 2012, from Dan Hagan, Greenview Environmental Management, to Lynda Mulcahy, MOE, RE: Application for Approval of Waste Disposal Sites, Black Donald Waste Disposal Site (A411902), Township of Greater Madawaska, County of Renfrew, MOE reference number: 3866-CTJ5V, with responses to waste review comments and questions.
- e-mail from Dan Hagan, Greenview Environmental Management Limited, to Lynda Mulcahy, MOE, sent August 22, 2012, 9:57am, Subject: RE TGM - Black Donald WDS - Application for Approval of Waste Disposal Sites - MOE Request for Additional Information (MOE Reference Number: 3866-8CTJ5V)

Schedule "B" is added to the Approval

Site Groundwater and Surfacewater Monitoring Program

Location	Frequency	Parameters
<u>Groundwater</u> BH1, BH2, BH3, BH4, MW08-5, MW08-6, MW08-7 I QA/QC	Twice per year (Spring, Fall)	Alkalinity, aluminum, ammonia, barium, boron, cadmium, calcium, chromium, cobalt, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, phenols, potassium, silicon, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc field measurements (pH, conductivity, temperature), water levels
BH1	Once every 5 years (Spring)	VOCs - EPA 624
<u>Surface Water</u> SW-3, SW-4, SW-5, SW-6 1 QA/QC	Three Times (Spring, Summer, Fall)	Alkalinity, ammonia, BOD, boron, cadmium, calcium, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, nitrite, phenols, potassium, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc, TSS Field Measurements (pH, conductivity, dissolved oxygen, temperature, unionized ammonia (calculation))

Page 5 - NUMBER A411902

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

Condition 15 was revised to reflect the updated Design, Operations and Development plan for the Site, and to ensure the Site does not cause nuisance or impacts.

Condition 16 was revised to clarify the currently-approved wastes that may be received at the Site.

Condition 23 was revised to update the Site inspection requirement.

Condition 26 was revised to reflect the updated Site monitoring programs.

Condition 29 was added to approve the Site trigger and contingency plan.

Condition 35 is added to ensure that storage and processing of construction and demolition wastes are carried out as described in the updated Design, Operations and Development plan, and are carried out in an environmentally-safe manner.

Condition 36 is added to ensure that leaf and yard waste storage and composting is carried out as described in the updated Design, Operations and Development plan, and are carried out in an environmentally-safe manner.

Condition 37 is included to specify cover requirements for the Site, to ensure operations to not cause impacts or nuisance.

Schedule B was added to the Approval to include the updated Site monitoring program.

This Notice shall constitute part of the approval issued under Approval No. A411902 dated March 27, 1980

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:

- 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;
- 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;
- The address of the appellant;
- 5. The environmental compliance approval number,
- 6. The date of the environmental compliance approval

Page 6 - NUMBER A411902

- 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 <u>AND</u> Toronto, Ontario M5G 1E5 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 24th day of January, 2013

THIS NOTICE WAS MAILED ON 0 C (Signed)

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

LM/ c:

District Manager, MOE Ottawa

Tyler H. Peters, Greenview Environmental Management Limited /

SIREBMC03250

Ontario

Ministry Ministère of the de

of the de Environment l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL WASTE DISPOSAL SITE NUMBER A411902 Notice No. 2

The Corporation of the Township of Greater Madawaska 1101 Francis Street Bagot, Blythfield And Brougham, Ontario K0J 1H0

MINISTRY ENVIRONIA

Site Location Black Donald Waste Disposal Site 34 Hydro Dam Road Greater Madawaska Township, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A411902 issued on March 27, 1980, and amended on October 22, 2001 for submission of development and operations report as per Condition No. (14) of October 22, 2001 amendment, as follows:

Condition No. (14) is hereby revoked.

The following conditions of approval are added to the Provisional Certificate of Approval:

SITE OPERATIONS:

- (15) The Site shall be constructed, operated and maintained in an environmentally safe manner, which minimizes the impacts of dust, odour, noise, litter, vector and vermin on the general public, Site personnel, and the natural environment, all in accordance to the Development and Operations Plan, Items 4, 5 and 6 of Schedule "A".
- (16) The Site shall only receive non-hazardous municipal waste that is generated from within the Township of Greater Madawaska.
- (17) The normal daily hours of operation for receiving waste at the Site are 7 am to 9 pm.
- (18) The total volumetric capacity of the Site, including waste, daily, interim and final cover, is 46,785 cubic meters.
- (19) The Owner shall ensure that there is no burning of waste, trees, brush and or clean wood piles at the Site.
- (20) All incoming waste shall be inspected prior to being received at the Site to ensure that the Site is approved to accept such a waste.

- (21) The Owner shall ensure that all wastes at the Site are managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.
- (22) The Owner shall maintain records of the results of all inspections and monitoring and a summary of all activities associated with the Site (e.g. spills, maintenance work) in a record book located at the Site.
- (23) The Owner shall conduct daily inspections of the equipment and facilities at the Site to ensure that they are maintained in good working condition all the times. Any deficiencies, which might negatively impact the environment, detected during these inspections shall be recorded in a log, and promptly corrected.
- (24) (a) A sign shall be posted in a prominent location at the entrance of the Site stating the hours of operation, the Owner's name, staff contact and telephone number to call in the event of an emergency or any complaints;
 - (b) Complaints received from the public or adjacent neighbours shall be recorded in a log book created and maintained for this purpose.
- (25) (a) The Owner shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation at this Site;
 - (b) All spills and upsets shall be immediately reported to the Ottawa District Office or the Ministry's Spills Action Centre at 416-325-3000 or 1-800-268-6060, and the Municipality, and shall be recorded in a log book as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences; and
 - (c) All waste material resulting from a spill or process upset, shall be managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.

MONITORING AND REPORTING REQUIREMENTS

- (26) Surface and groundwater monitoring shall be conducted in accordance to Section 9.1 and 9.2, Item 4 of Schedule "A" provided that the following conditions are met:
 - (a) Prior to the development of the Site, the Owner shall establish that the seasonal high water table is at least one meter below the proposed excavation bottom;
 - (b) In addition to the parameters listed in Table 2, Section 9.1, Item 4 of Schedule "A", Nitrate and Ammonia shall be included for groundwater monitoring; and
 - (c) The background groundwater monitoring well (BH-1) shall be established further away from the waste pile, and one groundwater monitoring well shall be established at the midway point of the Site's southern boundary.
- (27) By March 31, 2003, and on an annual basis thereafter, the Owner shall submit to the District Manager, an annual report on the development, operation and monitoring of the Site, including any

Page 2 - NUMBER A411902

. 1

recommendations or changes to the annual monitoring program, in accordance to Section 10.1, Item 4 of Schedule "A".

A written approval from the District Manager shall be obtained for any changes to the annual monitoring program prior to these changes being implemented.

(a) In accordance to the Phased Plan outlined in Section 9.1, Item 4 of the Schedule "A", and by March 31, 2003, included in the annual monitoring report, the Owner shall submit to the District Manager for written approval, trigger levels for initiating investigative activities into the cause of an increase in contaminant concentrations as established by the surface and ground water monitoring programs along with appropriate investigative activities and contingency measures;

(b) Within six (6) months from exceedance of the established trigger levels, the Owner shall submit to the Director for approval, the design of appropriate contingency measures and provide detailed plans, specifications and description for the design, operation and maintenance for the appropriate remedial actions; and

(c) The remedial actions shall be implemented within nine months from the approval by the Director.

BUFFER AREA AND CONTAMINANT ATTENUATION ZONE

(28)

(29)

(31)

1

(30) Within 60 days of issuance of this Amendment, the Owner shall arrange for a legal survey of the Site and required buffer area, as specified in Items 4 and 5 of Schedule A, to be conducted by an Ontario Land Surveyor registered under the Surveyors Act.

(a) By June 30, 2003, the Owner shall acquire the lands required for the contaminant attenuation zone in accordance to Figure 2 and Drawing 1, Item 4 of the Schedule "A". Alternatively, the Owner shall propose, by June 30, 2003, to the Director for approval, other methods for bringing the Site into compliance with respect to Guideline B-7, Reasonable Use Criteria and other applicable Ministry Regulations, Guidelines and Policies.

- (b) (i) By June 30, 2003, the Owner shall acquire lands required for the 30 meter southern and western buffer areas in accordance to Drawing 1, Item 4 of the Schedule "A". Alternatively, the Owner shall propose, by June 30, 2003, to the Director for approval, other Site development methods to allow for a 30 meter southern and western buffer within the current Site boundary.
 - (ii) The Owner shall not commence waste disposal activities on the southern and western Site boundary until Condition (31)(b)(i) has been met.
- (c) Within 30 days of purchase of lands noted in Condition (31)(a) and (31)(b), the Owner shall submit to the Director an updated legal survey of these lands for addition of these lands to the Certificate of Approval.

(32) The Owner shall ensure that no wastes are deposited within the designated 15 meter northern buffer area and the 30 meter eastern buffer area after the date of issuance of this Certificate of Approval.

PROHIBITION AND REGISTRATION ON TITLE

(33) Pursuant to Section 197 of the EPA neither the Owner nor any person having an interest in the Site shall deal with the Site in any way without first giving a copy of this Certificate to each person acquiring an interest in the Site as a result of the dealing.

(a) The Owner shall:

(i) Within sixty (60) calendar days of the date of this Certificate, submit to the Director for the Director's signature two (2) copies of a completed Certificate of Prohibition containing a registerable description of the Site, in accordance with Form 1 of O. Reg. 14/92 (Document General-Form 4- Land Registration Reform Act); and

(ii) Within ten (10) calendar days of receiving the Certificate of Prohibition signed by the Director, register the Certificate of Prohibition in the appropriate Land Registry Office on title to the Site and submit to the Director immediately following registration the duplicate registered copy.

SITE CLOSURE

(34) Within 2 years prior to the Site reaching its final capacity specified in this Amendment, the Owner shall submit to the Director, for approval, a plan for closure, post closure monitoring and maintenance of the Site. The plan shall include but not be limited to the final contours of the Site, completion, inspection and maintenance of the final cover, an assessment of the adequacy of the monitoring and contingency plans and any other post closure monitoring and care.

The following items are added to SCHEDULE "A":

 Township of Greater Madawaska, Black Donald Waste Disposal Site, Site Development and Operations Plan, Prepared by Jp2g Consultants Inc. dated January 2001.

5. Letter and accompanying documents dated November 13, 2001, from Brian Whitehead, Jp2g Consultants Inc., addressed to John Kaasalainen, MOE.

6. Letter dated March 13, 2002, from Nafiseh Pourhassani, P. Eng., MOE, addressed to Cathy Reddy, The Corporation of the Township of Greater Madawaska.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A411902 dated March 27, 1980 and amended on October 22, 2001.

Page 4 - NUMBER A411902

In accordance with Section 139 of the <u>Environmental Protection Act</u>, 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 <u>Environmental Protection Act</u>, provides that the Notice requiring the hearing shall state:

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

The Notice should also include:

3. The name of the appellant;

5

1.

2.

The address of the appellant;

5. The Certificate of Approval number;

- 6. The date of the Certificate of Approval;
- The name of the Director;
 The municipality within w
 - The municipality within which the waste disposal site is located;

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

AND

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 2300 Yonge St., 12th Floor P.O. Box 2382 Toronto, Ontario M4P 1E4

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 12th day of July, 2002



NP/

C:

District Manager, MOE Ottawa District Office Andrew Polley, MOE, Ottawa District Office / Bruce Harman, Lakefield Research Ltd.

Ian Parrott, P.Eng. Director Section 39, Environmental Protection Act

of the Ontario

Ministry Ministère of the de Environment l'Environnement AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL WASTE DISPOSAL SITE NUMBER A 411902

Notice No. 1

8%-

Corporation of the Township of Greater Madawaska P.O. Box 180 1101 Francis Street, Calabogie, Ontario K0J 1H0

Site Location: Black Donald Waste Disposal Site Pt. Lot 9, Conc. 3, 34 Hydro Dam Road Geographical Township of Brougham Township of Greater Madawaska, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A 411902 issued on March 27, 1980 for an increase in the site service area to include the Township of Greater Madawaska, as follows:

The following conditions of approval are added to the Provisional Certificate of Approval:

DEFINITIONS

- (2) For the purpose of this Certificate of Approval, unless the contrary intention appears, the following words and phrases shall have the following meaning attributed to them:
 - 2.1 "Adverse Effect" is as defined in the Environmental Protection Act, R.S.O. 1990.
 - 2.2 "Applicant" and/or "Owner" means the Township of Greater Madawaska.
 - 2.3 "Certificate" means the Provisional Certificate of Approval No. A 411902, as amended from time to time, including all schedules attached to and forming part of the Certificate.
 - 2.4 "Crown" means Her Majesty the Queen in Right of Ontario.
 - 2.5 "Director" means the one or more persons who from time to time are so designated for the purpose of Part V of the Environmental Protection Act.
 - 2.6 "District Manager" means the District Manager of the Ministry's Ottawa District Office.
 - 2.7 "EPA" means the Environmental Protection Act, R.S.O. 1990, Chapter E.19, as amended.
 - 2.8 "Ministry" and/or "MOE" means the Ontario Ministry of the Environment.
 - 2.9 "ODWS" means the Ontario Drinking Water Standards, as amended.
 - 2.10 "OWRA" means the Ontario Water Resources Act, R.S.O. 1990, as amended.

2.11 "PWQO" means the Provincial Water Quality Objectives, as amended.

"Site" means the entire waste disposal site including the landfilling area and the buffer lands as listed in Schedule "A" of the Certificate and consisting of approximately a 1.2 hectare landfill site.

"Supporting Documentation" refers to the reports listed in Schedule "A" of the Certificate.

GENERAL

(3)

(4)

(5)

(6)

2.12

2.13

The requirements specified in this Provisional Certificate of Approval are the requirements under the <u>Environmental Protection Act</u>, R.S.O. 1990. The issuance of this Provisional Certificate of Approval in no way abrogates the Applicant's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.

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

The Applicant shall ensure compliance with all the terms and conditions of this Provisional Certificate of Approval. Any non-compliance constitutes a violation of the Environmental Protection Act, R.S.O. 1990 and is grounds for enforcement.

(a) The Applicant shall, forthwith upon request of the Director, District Manager, or Provincial Officer (as defined in the Act), furnish any information requested by such persons with respect to compliance with this Provisional Certificate of Approval, including but not limited to, any records required to be kept under this Provisional Certificate of Approval; and

(b) In the event the Applicant provides the Ministry with information, records, documentation or notification in accordance with this Provisional Certificate of Approval (for the purposes of this condition referred to as "Information"),

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

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

- The Applicant shall allow Ministry personnel, or a Ministry authorized representative(s), upon presentation of credentials, to:
 - (a) carry out any and all inspections authorized by Section 156, 157 or 158 of the <u>Environmental Protection Act</u>, R.S.O. 1990, Section 15, 16 or 17 of the <u>Ontario Water Resources Act</u>, R.S.O. 1990, or Section 19 or 20 of the <u>Pesticides Act</u>, R.S.O. 1990, as amended from time to time, of any place to which this Provisional Certificate of Approval relates; and,

without restricting the generality of the foregoing, to:

- (i) enter upon the premises where the records required by the conditions of this Provisional Certificate of Approval are kept;
 - (ii) have access to and copy, at reasonable times, any records required by the conditions of this Provisional Certificate of Approval;
 - (iii) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the conditions of this Provisional Certificate of Approval; and
 - (iv) sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Provisional Certificate of Approval.
- (a) Where there is a conflict between a provision of any document referred to in Schedule "A", and the conditions of this Provisional Certificate of Approval, the conditions in this Provisional Certificate of Approval shall take precedence; and
- (b) Where there is a conflict between documents listed in Schedule "A", the document bearing the most recent date shall prevail.
- (9) The Applicant shall ensure that all communications/correspondence made pursuant to this Provisional Certificate of Approval includes reference to the Provisional Certificate of Approval number A411902.
- (10) The Applicant shall notify the Director in writing of any of the following changes within thirty (30) days of the change occurring:
 - (a) change of Applicant or operator of the Site or both;
 - (b) change of address or address of the new Applicant;

Page 3 - NUMBER A 411902

7).

(b)

(8)

(c) change of partners where the Applicant or operator is or at any time becomes a partnership, and a copy of the most recent declaration filed under the <u>Business</u> <u>Names Act</u>, 1991 shall be included in the notification to the Director;

- (d) any change of name of the corporation where the Applicant or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (form 1 or 2 of O. Reg. 182, Chapter C-39, R.R.O. 1990 as amended from time to time), filed under the <u>Corporations Information Act</u> shall be included in the notification to the Director; and
- (e) change in directors or officers of the corporation where the Applicant or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" as referred to in 9(d), supra.
- (11) In the event of any change in ownership of the Site, the Applicant shall notify, in writing, the succeeding owner of the existence of this Provisional Certificate of Approval, and a copy of such notice shall be forwarded to the Director.
- (12) Any information relating to this Provisional Certificate of Approval and contained in Ministry files may be made available to the public in accordance with the provisions of the <u>Freedom of Information and Protection of Privacy Act</u>, R.S.O. 1990, C. F-31.
- (13) All records and monitoring data required by the conditions of this Provisional Certificate of Approval must be kept on the Owner's premises for a minimum period of two (2) years from the date of their creation.

DEVELOPMENT AND OPERATIONS

- (14) Within 3 months of the date of this Notice, the Applicant shall submit to the Director for approval an updated development and operations report and supporting hydrogeological study outlining how the remaining capacity of the Site is to be utilized. These reports shall include the following information
 - site plans showing the waste disposal footprint, buffer zones, and contaminant attenuation zones, if required, including the ownership of such lands;
 - site operation and development plans;
 - daily/intermediate/final cover requirements;
 - security, fencing, signage, site supervision, housekeeping and screening requirements;
 - surface drainage plans, leachate and gas control plans;
 - a proposed monitoring program for landfill gas, leachate, groundwater, and surface water including trigger mechanisms and contingency plans;
 - reporting requirements; and
 - closure plans.

All in accordance with the following plans and specifications which are added to Schedule "A" of the Certificate:

The Application for a Provisional Certificate of Approval for a Waste Disposal Site dated January 11, 2001 as signed by Cathy Reddy, Clerk Treasurer of the Township of Greater Madawaska.

- The letter dated January 31, 2001 to Mr. A. Dominski of the Ministry of the Environment, Environmental Assessment and Approvals Branch from Mr. Brian Whitehead of Jp2g Consultants Inc. providing the purpose and basis for this amendment.
- 3. The letter dated March 1, 2001 to Mr. A. Dominski of the Ministry of the Environment, Environmental Assessment and Approvals Branch from Mr. Brian Whitehead of Jp2g Consultants Inc. requesting that the proposed amendment be split into two parts, one for the service area change and another for the site development aspects as well as the reasons for this request.

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

The reasons for this amendment are to allow for an increase in service area for the waste disposal site and to update the Certificate to meet the Ministry's current requirements.

The reasons for each of the conditions of approval are as follows:

1.

2.

-) The reason for Condition (2) is to define the specific meaning of terms used to simplify the conditions in this Certificate.
- 2) The reason for Conditions (3), (4), (5), (8), (9), (10), (11), (12) and (13) is to clarify the legal rights and responsibilities of the Owner.
- 3) The reason for Condition (6) and (7) is to ensure that the appropriate Ministry staff have ready access to information and the operations of the Site which are approved under this Provisional Certificate of Approval. Condition (7) is supplementary to the powers of entry afforded a Provincial Officer pursuant to the Environmental Protection Act, the Ontario Water Resources Act, and the Pesticides Act, as amended.
- 4) The reason for Condition (14) is to ensure that the continued use and operation of the Site is done in an environmentally acceptable manner.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No.A. 411902 dated March 27, 1980, as amended.

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

Page 5 - NUMBER A 411902

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

The Notice should also include:

The name of the appellant;

3.

4: 5.

6.

7.

i. 8.

1

t

L

C:

The address of the appellant;

The Certificate of Approval number;

The date of the Certificate of Approval;

The name of the Director;

The municipality within which the waste disposal site is located;

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

This Notice must be served upon:

The Secretary* Environmental Appeal Board 2300 Yonge St., 12th Floor P.O. Box 2382 Toronto, Ontario M4P 1E4

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 Appeal Board's requirements for an appeal can be obtained directly from the Board at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

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

DATED AT TORONTO this 12th day of October, 2001

THIS NOTICE WAS MAILED ON C (Signed)

Ian Parrott, P.Eng. Director Section 39, Environmental Protection Act

JK/ District Manager, MOE Ottawa Brian Whitehead, Planner, Jp2g Consultants Inc.

Ontario C	C-	
Ministry	133 Dalton St. Day 020	
of the	Kingston, Ontario	
Environment	K7L 4X6	
The second s	March 27, 1980	1. 1
Dacre Ontanio		÷
NOJ INO.		
RE: Dump Site		
Lot 9, Concession III		
Township of Brougham		
County of Renfrew		

The enclosed revised Provisional Certificate of Approval contains a condition requiring it be registered on title. The reason for this condition is attached to the Certificate.

Two copies of the Certificate and reasons are on long paper to facilitate registration. Both of these should be taken to the Land Registry Office and one returned to the Director with registration particulars.

If your Certificate does not contain sufficient legal description for registration because you have not given one to the Director, you will have to provide one under Section 23(1). (e) of The Registry Act or in your application under The Land Titles Act.

In the event that the site including its buffer, is part of a larger parcel of land and you do not wish to prepare a new survey at this time, you may register the Certificate against the larger parcel of land. If you do so, the Director is prepared, if requested in the future.

1. In the case of land recorded under The Land Titles Act, to consent to an application to delete the registration from the title of lands not within the site including its buffer zone, and

In the case of land recorded under The Registry Act, to issue a Certificate that lands not used for the actual disposal of waste or buffer zone have not been so used.

Such documents would be issued after suitable draft documents including legal description were submitted by you or your successor. The purpose of such documents would be to assure subsequent purchasers that the lands in question were not affected by section 46 of the Environmental Protection Act.

2.

Yours very truly

Ministry of the Environment

Ontario

Provisional Certificate No. A 411902

PROVISIONAL CERTIFICATE OF APPROVAL WASTE DISPOSAL SITE

oaroaroaroaroare926926926926926926926262

Under The Environmental Protection Act, 1971 and the regulations and subject to the limitations thereof, this Provisional Certificate of Approval is issued to:

Township of Brougham Dacre, Ontario NOJ 1NO

for the use and operation

of a 1.2 hectare dump site

all in accordance with the following plans and specifications:

ocated:

Lot 9, Concession III Township of Brougham County of Renfrew

which includes the use of the site only for the disposal of the following categories of waste (NOTE: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval) domestic and 5% other wastes, limited to scrap metal, brush, lumber and construction debris.

and subject to the following conditions:

1. No operation shall be carried out at the site after sixty days from this condition becoming enforceable unless this Certificate including the reasons for this condition has been registered by the applicant as an instrument in the appropriate Land Registry Office against title to the site and a duplicate registered copy thereof has been returned by the applicant to the Director.

THIS IS A	TRUE COPY	COF THE E MAILED
ON April	9/83	
(Signod)	himmen	

Dated this 27thday of March , 19 80



Ministry of the Environment



TO: Township of Brougham Dacre, Ontario NOJ 1NO

You are hereby notified that Provisional Certificate of Approval No. A 411902 has been issued to you subject to the conditions outlined therein.

NOTICE

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

The reason for the condition requiring registration of the Certificate is that Section 46 of The Environmental Protection Act, 1971 prohibits any use being made of the lands after they cease to be used for waste disposal purposes in order to protect future occupants of the site and the environment from any hazards which might occur as a result of waste being disposed of on the site. This prohibition and potential hazard should be drawn to the attention of future owners and occupants by the Certificate being registered on title.

You may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board.

This Notice should be served upon:

The Secretary, Environmental Appeal Board, AND 1 St. Clair Ave. West, 5th Floor, Toronto, Ontario. M4V 1K7 The Director, Section 39 Ministry of the Environment, Ministry of the Environment,

DATED

this 27th day of March .

, 1980 -

AAMOIII.

Attachment 2 2021 Annual Report Figures







1						DRAWN BT:	CHECKED BT:	CUENT:	PROJECT:
I	\$Greenview	<u> </u>		-		MAG	DMH		
	ENVIRONMENTAL MANAGEMENT					DESIGNED BY:	APPROVED BY:	*	SURFACE WATER MONI 2021 ANNUAL MC
		1	MAR18-22	MAG	ISSUED FOR MECP REVIEW	- MAG	DMH	GREATER MADAWASKA	BLACK DONALD WA
13 Commerce Court Bannott, Colladio 511312.007 greenview-environmental.ca	0	JAN25-22	MAG	ISSUED FOR CLIENT REVIEW	SCALE: NTS	DATE: MAR 2022		TOWNSHIP OF GRI	
	No.	DATE	BY	REMARKS		mret 2022			







Attachment 3 Borehole Logs

02/01/2006 WED 15:54 FAX 705 652 0743 SGS

T.

图002/005

BORI HYDRO Black D	DGEC	DLE LOG DLOGICAL INVESTIGATION	PROJECT:	21-373	;				AT	EHC E:	DLE: 1 13 July 2001	lo
FOR:	Tow	nship of Brougham		-				E	CLE	VAT	10N 93.4	m
	AHA			E.	-	S	AM	PLI	C			T
DEPTH (m)	FRATIGRA	STRATIGRAPHIC DI	SCRIPTION	MONITOR DETAILS	UMBER	TYPE	I VALUE	WATER	RBC	RQD	N VALUE	CONTI (%)
	S	SAND .		.tetel en e	4	SS	20	2	80	cha	15 30 45 60	10 20 30
		Reddish and modium brown fine san medium and coarse sand, trace fine a silt, subtle laminations, moist, compr occasional cobbles observed below (d, trace to some nd coatse gravel, frace et.).6 m.		2	SS	25	3	70		-	A
15		-heavy oxidation observed below 1.2	m. .		3	SS	37/	8	50	1		A : :
2	MARK	MARBLE REDROCK Light grey to whitish marble bedrock appearance, some oxidation along fra	, massive, pepper		4	UQ	0.080		100	78		
	BBBBB	between about 1.7 m and 1.9 m. Op oxidation at about 2.10 m to 2.12 m. along fracture at about 2.8 m.	 broken rock in fracture with Minor oxidation. 			100000000000000000000000000000000000000	*					
. 3	1999		8 (A)		5	HQ			96	100		1 : : :
	GOGG				2020							
4				11.12		2002 E 200					::::	
			1 .	1111	. 6	HO			106	96		
5 -	NUS ISI		4 ⁴	112	-		÷			-		
		1. A.		11010						4	::::	
6		4	1	1010								
	1995		ţ			AHÓ		3	100	82		
, 7		2	1	1111	- Harris	10.100					111	
7.7	1995		ł.		acer							
	Π	Borehole terminated at 7.69 m in ma	rble bedrock.									
9 1				1								
		4										
			÷								1111	

and the second

-

-

1

roje Ilen Dcal	ct N ct: E t: To lon:	o: 10392-001 Ilack Donald Waste Disposal wnship of Greater Madawask Black Donald	Sile					1	Log of Borehole: BH2
	Symbol	Description	Elev	N Value		Method	Type	Well	ogged By: D.Bucholtz
1	RE	Ground Surface - 98:984m	1					Π	Well Equipped with lockable steel casing and weather proof lock.
11:::13		Top Soil Black, organic, dry, with rootlets	-0.6	1 22	-		SS		Concrete
URHIDE		Sand Fine, 100se, dry Marble Bedrock	1				HQ		- 0.05m dia. PVC
DEPENDENCE.		Light gray to white with black specks,							Bontonile
		Fractures oxidized.		10			HQ		
		Mostly competent, fractures @ 3.35m, 4.88m, 6.40m.			1	T			4
安安						1	Q	-	WL October 8, 2002 = 4,18m
		1		-		1.	Q		Silica Sand
になっていた。	HANNA I			<u> </u>		-			
語度	HHHH	· · ·	-7.08			н	a		
		End of Borehole							
		*							
ho	: CN	E 75 Diamond Bit Coring	-		1		1		

02/01/2006 WED 15:54 FAX 705 652 0743 SGS

T.

T.

Τ.

T.

Ľ

Ľ

Ţ

T

Ē

L

1004/005



Ì.

Ł

Ł.

ł.

L

L

1.



Greenview E 69 Cleak Avent Banorð, Ontar t (613) 332-07 t: (613) 332-17 e: solutions@g	Greenview-environ	MENTAL MANAGEMENT	Log of Monitoring Well: MW08-5 Project No.: 102.08.014 Project: Black Donald Waste Disposal Site Client: Township of Greater Madawaska Location: See Site Plan									
_	SUBSI	JRFACE STRATA PROFILE		i	SAN	E						
Depth	Symbol	Description	No.	Туре	% R	SPT D N-Value 15 30 45 60	ompletion etails	- Comments				
-4 m						4	=	Stick-up = 0.89 m				
	~~ ~	Ground Surface	-	140	10		[automo.]	Concrete				
2		Dark brown, organic, dry, loosely compacted.		100				5				
4		Fine to Medium Sand Light brown to grey, fine to medium	2	HQ	80			Bentonite Chips				
6		sand, dry, loosely compacted.		HO	100							
10 3		Light grey to white with black specks, marble bedrock.	3	1102	100							
12		Oxidized fractures from 1.83 m to 2.82 m, and from 11.25 m to 12.50 m.	4	НО	90							
14		Mostly competent, fractures from										
16 5		0.05 11 10 11.12 11.	5	HQ	100			Silica Sand				
20												
22 7			6	HQ	100			4				
24			_	24			•					
26			7	но	100							
30 9												
32				10	100			Well seres - 0				
34				1102	100			m x 0.05 m				
36 1		1						2.0				
38			9	HQ	100	-		Water level lus-				
40			1.5				- 9 -	2008 = 12.85 m.				
	3		10	HQ	100							
hita		End of Borehole	1									

1 1 1



BG FO ENVIRON wenue, P.O. Box 100 Ontario KOL 100 132-0057 322-1767 ms@greenvlew-enviro	EENVIEW	Log of Monitoring Well: MW08-6 Project No.: 102.08.014 Project: Black Donald Waste Disposal Site Client: Township of Greater Madawaska Location: See Site Plan										
SUBS	URFACE STRATA PROFILE			SAN	PLE							
h Symbol	Description	No.	Туре	% R	SPT N-Value 15 30 45 60	Well Completion Details	Comments					
n				-		- 1	Stick-up = 0.87 m					
-1	Ground Surface Top Soil Dark brown, organic, dry, loosely Compacted. Fine to Medium Sand Light brown, fine to medium sand, dry,	1	AS HQ	25 100			Concrete Bentonite Chips					
- 3	Marble Bedrock Light grey to white with black specks, marble bedrock. Heavily fractured from 0.05m to 1.45m.	,З	HQ	100	40							
-5	5.28m, 5.59m, and 7.48m.	4	HQ	100			Silica Sand					
		5	HQ	95		ż	Water level June 8 2008 = 5.50 m					
7		6	HQ	100			÷φ					
9		7	HG	100								
- 11		8	HG	100								
Greenview En 19 Cleak Avenue Jancroft, Ontario (613) 332-176 (613) 332-176 (1) 332-176 (1) 332-176 (1) 332-176	Since NVIRONM VI	ECONICO IENTAL MANAGEMENT nagement Limited		P F C	roject Project Client: Locatio	No.: 1 :: Black Towns on: See	Log of Mc 02.08.014 Conald Waste Dispo hip of Greater Madav e Site Plan	onitoring Well: M osal Site vaska	W08-6			
---	--	--	-----	-------------	---	--	---	---	-------------------------------			
4	SUBSUR	RFACE STRATA PROFILE		-		SAM	MPLE	1				
Depth	Symbol	Description		No.	Туре	% R	SPT N-Value 0 15 30 45 60	Well Completion Details	Comments ·			
38 40 40				9	HQ	100			1			
42-ph/				10	HQ	100						
40 48 50 101				11	HQ	100						
52 54 56 56			14)	12	HQ	100						
58 60 60	3			13	HQ	100						
62 hhad had had had had had had had had ha	0			14	HQ	100			a t			
684hhhhhhh 6870		×		15	5 HG	100						
72-thinking 2 74-thinking 2	2			16	5 SS	3 100			Well screen = 6 m x 0.05 m			
76		End of Borehole	×	4		C			· · · ·			

2

110

ц. 1

A TOTAL TO A

-

_

Benview B Cleak Aven (croth, Orda 613) 332-01 613) 332-11 solutions @	CONTRACTION OF THE STREET CONTRACT OF THE STREET OF THE STREET CONTRACT OF THE STREET OF THE		Projec Projec Client: Locati	t No.: t: Blac : Town on: Si	Log o 102.08.014 Ik Donald Waste ship of Greater N ee Site Plan	f Mo Dispos Aadaws	nitoring Well: al Site	MW08-7	
	SUBS	URFACE STRATA PROFILE	-		SA	MPLE	-		1
)epth	Symbol	Description	No.	Туре	% R	SPT . N-Value	600	Well Completion Details	Comments
E Entrininini E			1					- F	Stick-up = 0.85 m
արդարդեր		Ground Surface Medium Sand and Gravel Brown, medium sand with small to medium gravel, wet, compacted.	1	AS	2			to should be able of the	Concrete
	Fine to Medium Sand and Gravel Light brown, fine to medium sand with small to medium gravel, wet,	2	SS	10			¥	Water level June 2008 = 0.91 m	
hhili		compacted.	з	SS	5				Bentonite Chips
mhilun			4	SS	15				
andrahan and and and and and and and and and a		Fine to Medium Sand Light brown, fine to medium sand, wet, compacted, small to medium cobble at 3.05 m.		-					Olline Dand
ahalaha 4			5	SS	.50				, .
6 6 1 1 5									
8 alphalada			6	SS	10	•			
and and a second		•	7	SS	75				Well screen = 3.
			_						m x 0.05 m
28		End of Borehole			-				-
Dri Dri	lled By: La	antech Drilling Ltd. Hollow Stem Augers	1					Logged B Checked	y: J. Balley By: T. Peters

÷

Attachment 4 Current vs Proposed Monitoring Program

ATTACHMENT 4 Current vs. Proposed Monitoring Program

Current Program: Schedule B, ECA A411902

Site Groundwater and Surface water Monitoring Program:

Location	Frequency	Parameters
<u>Groundwater</u> BH1, BH2, BH3, BH4, MW08-5, MW08-6, MW08-7 1 QA/QC	Twice per year (Spring, Fall)	Alkalinity, aluminum, ammonia, barium, boron, cadmium, calcium, chromium, cobalt, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, phenols, potassium, silicon, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc. Field measurements (pH, conductivity, temperature), water
		levels
BH1	Once every 5 years (Spring)	VOCs- EPA 624
Surface Water SW-3, SW-4, SW-5, SW-6 1 QA/QC	Three Times (Spring, Summer, Fall)	Alkalinity, ammonia, BOD, boron, cadmium, calcium, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate nitrite phenols, potassium sodium, strontium, sulphate total phosphorus, TKN, TDS, zinc, TSS Field measurements (pH, conductivity, dissolved oxygen, temperature, unionized ammonia (calculation))

Proposed Program:

Location	Frequency	Parameters
Groundwater BH1, BH2, BH3, BH4, MW08-5, MW08-6, MW08-7 + 1 bilevel monitoring well + 1 bedrock monitoring well (possible replacement of BH3) 1 QA/QC	Twice per year (Spring, Fall)	Alkalinity, aluminum, ammonia, barium, boron, cadmium, calcium, chromium, cobalt, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, phenols, potassium, silicon, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc Add: conductivity, pH, mercury, arsenic, lead, nitrite, TSS (leachate), BOD5 (leachate) Field measurements (pH, conductivity, temperature), water levels. Add: landfill gas
BH1 (leachate)	Once every 5 years (Spring)	VOCs- EPA 624
Surface Water SW-4, SW-5 1 QA/QC	Three Times (Spring, Summer, Fall)	Alkalinity, ammonia, BOD, boron, cadmium, calcium, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate nitrite, phenols, potassium sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc, TSS Add: conductivity, pH, lead, mercury, arsenic, barium, chromium Field measurements (pH, conductivity, dissolved oxygen, temperature, unionized ammonia (calculation)), Add: flow

Attachment 5 Drawings



A B B B B B B B B B B	
of Bagot, Blythfield, & 1. concesson =	BROUGHAN
BP OF BAGOT, D, & BROUGHAM Waste Disposed Site CONDITIONS FLAM	1



No.	DATE	BY	REVISIONS	



BM #1 ELEV. 100.000 ASSŰMED ELEVATION SPIKE IN TOP OF 3000 POPLAR STUMP, APPROXIMATELY 5m NORTH EAST OF RIGHT GATE POST AT ENTRANCE TO WASTE SITE.

BM #2 ELEV. 98.572 SPIKE IN SOUTH WEST SIDE OF 3000 POPLAR LOCATED AT NORTH EAST END OF SITE, APPROXIMATELY 22m FROM TSP #3.

101,0

BAR SCALE

EXISTING CONDITIONS ARE BASED ON TOPOGRAPHIC SITE SURVEY BY Jp2g CONSULTANTS INC. DATED NOVEMBER 6, 2001.

DESIGNED DRAWN MOC CHECKED APPROVED SCALE HORIZ. 1:400

TOWNSHIP OF GREATER MADAWASKA BLACK DONALD LANDFILL SITE

EXISTING CONDITIONS PLAN

date MAY 2002 PROJECT 2006017 PLOTTED May 07/2002 DRAWING xisting2001.dwg

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.









С.	DESIGNED MAB DRAWN KJK/SPM CHECKED KM APPROVED SCALE	TOWNSHIP OF GREATER MADAWASKA BLACK DONALD WASTE DISPOSAL SITE
	1:500	PHASE 5 AND FINAL CONTOURS



Ministry of the Environment, Conservation and Parks Eastern Region 1259 Gardiners Road, Unit 3 Kingston ON K7P 3J6 Phone: 613.549.4000 or 1.800.267.0974 Ministère de l'Environnement, de la Protection de la nature et des Parcs Région de l'Est



et des Parcs Région de l'Est 1259, rue Gardiners, unité 3 Kingston (Ontario) K7P 3J6 Tél: 613 549-4000 ou 1 800 267-0974

MEMORANDUM

January 6, 2023

- TO: Thandeka Ponalo Senior Environmental Officer Ottawa Area Office Eastern Region
- FROM: Alija Bos Hydrogeologist Water Resources Unit Technical Support Section Eastern Region
- RE: Black Donald Waste Disposal Site A411902 2021 Annual Monitoring Report ECHO Task #1-134990036

As requested, I have reviewed the following documents entitled:

- "2021 Annual Report, Black Donald Waste Disposal Site (A362202), Township of Greater Madawaska, Count of Renfrew, Ontario" dated March 21, 2022, prepared by Greenview Environmental Management (GEM)
- "Black Donald Landfill Site Township of Greater Madawaska, ECA No. A411902, Expansion Feasibility Study" Prepared by JP2G Consultants Inc., dated October 25th, 2022.

The Township of Greater Madawaska submitted an assessment on the feasibility to expand the site for continued disposal of bulky and Construction and Demolition (C&D) waste. Based upon the information provided in the document above, I submit the following comments for your consideration. I have provided main conclusions and recommendations in the "Summary" section of this memorandum and more detailed comments in the "Conclusions and Recommendations" section below.

<u>Summary</u>

- The migration of leachate is downward into a thin sand layer and into the fractured marble bedrock.
- A north-south trending groundwater divide is thought to exist beneath the waste mound causing landfill leachate to migrate west and east. groundwater level data confirms that a groundwater basin exists in and around BH4 which would limit the northwestward migration of leachate.

- The Black Donald site was interpreted to conform with MECP Guideline B-7 at the downgradient eastern and southwestern CAZ boundaries in 2021.
- I recommend that the report should be reviewed by the Surface Water Unit.
- I support the proposed expansion area from a groundwater perspective, provided additional multilevel downgradient monitoring wells are installed, monitoring well BH3 is replaced, and the monitoring program and trigger mechanism are updated as discussed below.

Site Description and Environmental Compliance Approval

The Black Donald Waste Disposal Site (WDS) is located on part of Lot 9, Concession 2 and 3, geographic Township of Brougham in the Township of Greater Madawaska, Ontario.

The Black Donald WDS operates under Environmental Compliance Approval No. A411902 last amended January 24, 2013, which describes the Site as a 1.2 hectare waste disposal site. ECA Section (2) 2.12 defines the Site as 'the entire waste disposal site including the landfilling area and the buffer lands as listed in Schedule "A" of the Certificate and consisting of approximately 1.2 hectare landfill site". Upon review of the documents in Schedule "A" the Site comprises a 0.9 ha landfilling area within a total site area of 27.2 ha.

The site received waste from the Township's Griffith, Norway Lake, and Mount St. Patrick Transfer Stations.

It was previously requested (2016) by Greenview and the Township that MECP consider removing the requirement for surface water sampling as part of the monitoring requirements, as surface water quality data did not indicate impacts related to landfill-related activities. Based on the MECP surface water technical support review, it was indicated that monitoring should continue as part of the environmental monitoring program.

Proposed Expansion

It is my understanding that the current site has a design waste capacity of 34,250m³ (excluding final cover). The theoretical maximum capacity of a 1.2 ha site to a pyramidal peak is 54,200m³.

The figure provided by GEM illustrates a conceptual expansion which could add another 30,000 to $<40,000m^3$. A change of less than $40,000m^3$ is exempt from the EA Act. As such, JP2G has recommended the application be less than $40,000m^3$. This represents a proposed expansion of \sim 73% from the current approval.

As of December 14, 2021, the remaining capacity was 4400m³ (Greenview, 2022). The life expectancy could be 2 to 5 years depending on the annual landfilling rate.

The WDS was closed to the public on April 5th, 2010, with disposal available for municipal vehicles and Township-approved haulers only. Since 2010 the site has been used for the stockpiling of construction and demolition and bulky wastes prior to processing and disposal within the approved waste disposal area (AWDA). Bentonite clay material was placed at the WDS in 2021, as part of the regular and final cover requirements.

Topography and Drainage

The consultant described the area to be generally hilly and forested. The site is located on a topographic high, and a steep slope leading to a low-lying area is located at the south, west and southeast limit of the waste site. Drainage is through the surficial sand at the site following topography to roadside ditches along Hydro Dam Road.

Geological and Hydrogeological Conditions

Overburden geology is characterized by a thin veneer of sandy overburden, 0.3-1.5 metres thick, overlying the fractured marble bedrock unit. Bedrock outcrops, knolls, and knob hills are noted the be prevalent in the vicinity of the Black Donald site, which confirms the shallow nature of overburden soils and the proximity of the bedrock contact to surface near the site.

The hydrogeological conceptual model for the site is that landfill leachate moves down into the underlying native sand unit, then into groundwater in the fractured marble bedrock where it flows southeast and southwest. Groundwater was encountered in the shallow fractured marble bedrock.

It is interpreted that a groundwater divide exists at the waste mound, and predominant flow is southeast and southwest.

An eastward trending groundwater flow direction was interpreted in the vicinity of monitoring well MW08-6. Based on the upgradient location of MW08-6 relative to the waste mound, groundwater quality at MW08-6 was interpreted to be characteristic of background groundwater quality at the site. A north-south oriented groundwater basin depression was also interpreted to exist in the vicinity of BH4 and MW08-5, based on groundwater elevations and contours measured and calculated from field measurements.

The closest residential well is located approximately 700m northwest and upgradient from the site.

Groundwater – Surface Water Interaction

The groundwater is inferred to eventually discharge to surface water downgradient within the CAZ of the site.

Based on the surface water quality results in 2021, and the significant distance of each sampling location from the Black Donald site, the surface water systems south and southeast of the Black Donald site were not interpreted to be impacted from landfill-

related activities by GEM. Detailed review and interpretation of surface water conditions are provided by the ministry's surface water reviewer.

Groundwater Monitoring

The monitoring program approved under the current ECA is to satisfy Condition 27. The monitoring program as detailed in ECA Schedule "B" consists of the bi-annual collection of static water levels and groundwater samples from seven (7) monitoring wells, and surface water samples collected three times per year from four (4) locations.

GEM conducted spring (May 18), and fall (November 4) groundwater monitoring of the site in 2021. This was an approved reduction from the Spring, Summer and Fall sampling previously occurring. The Township with support from their consultant sampled and surveyed the monitoring wells and surface water stations.

Background Water Quality

MW08-6 is considered the background well installed on Crown Land on the opposite side of the Hydro transmission line. This well has shown DOC ODWS non-conformance and an increasing trend in the past 5 years.

BH2 is also considered a potential background location located approximately 25m east and downgradient of the fill area. Water quality is characterized by elevated concentrations of some landfill leachate parameters however given the proximity to Hydro Dam Road, road salting may also be a factor. There was one ODWS nonconformance for Dissolved Organic Carbon (DOC) at BH2. There appears to be an increasing DOC trend in this well. This well is not an ideal background location and MW08-6 should be used for background water quality assessment moving forward.

Leachate Quality

BH1 has historically been used for VOC sampling and can be considered the leachate characterization well at this site.

Groundwater at BH-1 was interpreted to be most representative of leachate quality at the Black Donald site. Non-conformances of ODWS and significant groundwater trends at groundwater monitoring location BH-1were as follows:

Monitoring Moll	ODWS Non-	Conformanc e	Five (5) Year Trend Analysis			
Monitoring wen	Spring 2021	Fall 2021	Increasing	Decreasing		
BH1	 Alkalinity DOC Hardness Manganese Total Dissolved Solids (TDS) 	 Alkalinity DOC Hardness Iron Manganese TDS 	 Ammonia (un-ionized) Nitrate Sodium Sulphate 	 Aluminum Barium Calcium Chloride Hardness Iron Magnesium Manganese Potassium Strontium Total Kjeldahl Nitrogen (TKN) 		

These values are not surprising given the well location immediately downgradient of the waste mound. Older landfills often have nitrogen concerns as a result of the generation of ammonia, and nitrate, dissolved solids and the concentrations of these vary depending on the age of the landfill.

Based on 2021 results, groundwater at BH-4 was interpreted to be impacted by landfillrelated activities: however, to a lesser extent than at leachate monitoring well BH-1. The interpretation that groundwater in the western portion of groundwater flow at the site was less impacted than the eastern component of groundwater flow at the site was supported by horizontal gradients calculated in spring, summer, and fall 2021 and documented groundwater quality. Considering the groundwater flow directions calculated following 2021 groundwater monitoring events and based on similar historical calculations, BH4 was interpreted to be the downgradient receiver of groundwater flow from the vicinity of the waste mound and from the northwest in the vicinity of background monitoring well MW08-6.

Downgradient Water Quality / Trigger Mechanism

Groundwater immediately downgradient from the site at monitoring wells BH1, BH3, and BH4 was interpreted to be impacted from landfill-related activities in 2021. Most parameter concentrations were above median background groundwater quality results, with non-conformances of ODWS for concentrations of alkalinity, DOC, hardness, iron, manganese, and TDS noted at select monitors. The generally lower parameter concentrations at monitoring well BH3 compared to those at monitoring wells BH1 and BH4 were attributed to its location partially cross-gradient to the waste mound and along the groundwater divide at the site. BH4 is the southwest CAZ boundary well.

It was interpreted that concentrations resultant of landfill-related factors originating in the vicinity of the waste mound would not likely migrate past the western CAZ boundary. Instead, groundwater was interpreted to flow in a southerly direction along the apparent groundwater basin towards MW08-5 and the downgradient southwestern CAZ boundary. Therefore, it is interpreted that given the considerable distance of BH4 to the downgradient southwestern CAZ boundary (approximately 170 m), and naturally-occurring high concentrations of alkalinity, aluminum, DOC, hardness, and TDS in the background, the site was interpreted to conform with MECP Guideline B-7 and was in

compliance with RUC in 2021 at the southwestern CAZ boundary. Given historical flow direction maps, I find this assumption to be reasonable. Groundwater flow directions calculated in fall 2021 are different than historical measurements as a result of BH3 being destroyed and therefore a weight bias for the model has shifted to the remaining wells. A replacement well for BH3 should be installed.

Guideline B-7

Guideline B-7 indicates that the groundwater quality cannot be degraded by an amount in excess of 50% of the difference between background and the Ontario Drinking Water Standards for non-health related parameters and in excess of 25% of the difference between background and the Ontario Drinking Water Standards for health-related parameters.

No RUC non-conformances were documented in results from downgradient monitoring well MW08-7 in 2021 that were attributed to landfill-related factors. The noted RUC non-conformance in fall 2021 at MW08-7 for DOC was consistent with DOC concentrations observed in background wells BH2 and MW08-6. Based on the above, the Black Donald site was interpreted to conform with MECP Guideline B-7 at the downgradient eastern CAZ boundary in 2021. Based on 2021 results, it was extrapolated that given the considerable distance of BH4 to the downgradient southwestern CAZ boundary (approximately 170 m), and naturally occurring elevated concentrations of alkalinity, aluminum, DOC, hardness, manganese, and TDS in the background (BH2 and MW08-6), the site was interpreted to conform with MECP Guideline B-7 at the southwestern CAZ boundary.

Based on the surface water quality results in 2021, and the significant distance of each sampling location from the Black Donald site, the surface water systems south and southeast of the Black Donald site were not interpreted to be impacted from landfill-related activities by the consultant. Non-conformances of PWQO for concentrations of DO (low), phosphorus, iron and zinc noted in 2021 at select sampling locations for select sampling dates were attributed to naturally occurring conditions in the background (SW-4), as well as to low-flow surface water conditions.

In 2021, PWQO non-conformances at key trigger locations SW-3 and SW-6 for concentrations of iron were attributed to low water/ low-flow conditions, and not to landfill-related activities. Similarly, PWQO non-conformances for concentrations of phosphorus at key trigger location SW-3 were generally consistent with concentrations observed at background location SW-4 and were therefore not attributed to landfill-related factors.

No RUC non-conformances were noted for any of the key trigger parameters at key trigger location MW08-7 following inclusion of 2021 results. Based on a review of five (5) year time trend analysis for parameters un-ionized ammonia, barium, boron, chloride, chromium, COD, iron, nitrate, sodium, sulphate, TKN and total phosphorus, the Trigger Mechanism was not interpreted to be activated in 2021.

Conclusions and Recommendations

The migration of leachate is downward into a thin sand layer and into the fractured marble bedrock.

A north-south trending groundwater divide is thought to exist beneath the waste mound causing landfill leachate to migrate west and east. groundwater level data confirms that a groundwater basin exists in and around BH4 which would limit the northwestward migration of leachate.

The Black Donald site was interpreted to conform with MECP Guideline B-7 at the downgradient eastern and southwestern CAZ boundaries in 2021.

I recommend that the report should be reviewed by the Surface Water Unit.

The consultant has provided the following recommendations in relation to the proposed expansion and my response to each recommendation is provided in bold typeface:

1. The updated monitoring program will continue to sample the monitoring wells as per ECA Schedule "B", with the proposed addition of the following as shown on Drawing No 2 below (Greenview base plan)

• one (1) bi-level monitoring well within the overburden (if available) and bedrock aquifers east of the landfilling area to further delineate the plume within the groundwater towards MW08-7; I support this recommendation in order to evaluate the potential for offsite migration of leachate impacted groundwater downgradient of the expansion area.

• compliance well MW08-7 is installed in the overburden (sand material), therefore it is recommended to also install a bedrock monitoring well in this location to delineate leachate in the bedrock aquifer in this direction; I support this recommendation. This is shown in the figure included below from the GEM report. The red line represents the proposed expansion areas.

I would like to request an additional design drawing be submitted with the cross section of the waste areas (historical and proposed) including elevations.



• monitoring well BH3 was destroyed in 2021 due to landfilling activities; this well should be reinstated to aid in assessing leachate migration south of the fill area. I support this recommendation.

2. The water quality analysis will be expanded to Schedule 5 Column 1 of the Landfill Standards (1988).

This includes the following parameters: Alkalinity, aluminum, ammonia, barium, boron, cadmium, calcium, chromium, cobalt, chloride, COD, copper, DOC, hardness, iron, magnesium, manganese, nitrate, phenols, potassium, silicon, sodium, strontium, sulphate, total phosphorus, TKN, TDS, zinc.

I support the proposed use of Schedule 5 Column 1 and also recommend that the following parameters are also added to the regular groundwater monitoring program: conductivity, pH, mercury, arsenic, lead, nitrite, TSS (leachate), BOD5 (leachate). I further recommend that the following field measurements are added to the regular groundwater monitoring program: pH, conductivity, temperature, water levels and landfill gas measurements.

Upon installation and sampling it is further recommended to update the trigger mechanism and contingency plan to reflect the proposed expansion and additional monitoring locations. **I support this recommendation.**

I support the proposed 73% expansion area from a groundwater perspective, provided additional multilevel downgradient monitoring wells are installed, monitoring well BH3 is replaced, and the monitoring program and trigger mechanism are updated as discussed above.

Alija Bos

P.Geo., Regional Hydrogeologist

- ec: Mark Phillips, Surface Water Specialist Thandeka Ponalo, Sr. Environmental Officer V. Castro, Water Resources Unit Supervisor C. Klein, Technical Support Section Manager
- c: GW File RE GM 01 02 (Black Donald Waste Disposal Site) AB / ECHO 1-134990036

Ministry of the Environment, Conservation and Parks Eastern Region 1259 Gardiners Road, Unit 3 Kingston ON K7P 3J6 Phone: 613.549.4000 or 1.800.267.0974 Ministère de l'Environnement, de la Protection de la nature et des Parcs Région de l'Est 1259, rue Gardiners, unité 3 Kingston (Ontario) K7P 3J6

Tél: 613 549-4000

ou 1 800 267-0974



MEMORANDUM

January 11, 2023

- TO: Thandeka Ponalo Senior Environmental Officer Ottawa District Office Eastern Region, MECP
- FROM: Mark Phillips Surface Water Scientist, Water Resource Unit, Eastern Region, MECP

RE: 2021 Annual Monitoring Report and Expansion Feasibility Study Black Donald Waste Disposal Site Part Lot 9, Concession 3, Geographic Township of Brougham 34 Hydro Dam Road, Township of Greater Madawaska, County of Renfrew Certificate of Approval (ECA) No. A411902 ECHO #: 1-134948602

I have reviewed the following documents from a surface water impact perspective and provide the recommendations below for your consideration:

- 1. 2021 Annual Report (Greenview Environmental Management Limited; March 21, 2022);
- 2. Black Donald Landfill Site Expansion Feasibility Study (Jp2g Consultants Inc.; October 25, 2022);
- 3. Memorandum from B. Metcalfe on the 2015 Annual Monitoring Report Black Donald Waste Disposal Site (Metcalfe; July 4, 2016); and
- 4. Memorandum from A. Bos on the 2021 Annual Monitoring Report (Bos; January 6, 2023).

Background

The Black Donald Waste Disposal Site (WDS) operates as an active waste disposal site and in accordance with the Provisional Certificate of Approval A411902. The Black Donald WDS was closed to the public on April 5, 2010. However, disposal operations at the site are currently available to municipal vehicles and Township-approved haulers only. The site is currently operating as a municipal solid waste landfill, accepting domestic, construction and demolition, and bulky waste for disposal. The landfill site currently consists of an approved fill area of 0.9 ha within a total licensed area of 21.36 ha, inclusive of lands used for operational buffer and CAZ purposes. The landfill site functions as a natural attenuating site. Based on the 2021 fill rate, the remaining capacity at this site was calculated to be approximately 4,400 m³ which equates to approximately 5 years of remaining capacity.

Surface Water Regime

The landfilling area is located on a topographical high bounded to the north by a bedrock ridge along the hydro transmission corridor. Site/area groundwater and surface water flow direction has been determined to be to the southeast and southwest. The primary pathway for groundwater flow is interpreted to flow downgradient towards discharge within the CAZ lands. Surface water sampling locations are located at the intermittent creek and wetland/bog complex approximately 500 metres downgradient from the site. The WDS is located within the Black Donald Lake watershed, Madawaska River Basin.

2021 Annual Monitoring Report

In 2021 surface water monitoring was conducted by Greenview on May 18, August 19, and November 4. Surface water samples were collected when water was present at sample stations SW3, SW4, SW5 and SW6. The collected surface water samples were analyzed for routine general chemistry parameters, a limited metals parameters analyses and phenols. Field measurements were taken for pH, conductivity, dissolved oxygen and water temperature for each surface water sampling event.

The 2021 surface water monitoring program measured PWQO exceedances at SW-4 for total phosphorus and zinc; for iron and low dissolved oxygen at SW-5; for total phosphorus and (high) pH at SW-6; and for total phosphorus, iron, manganese, and zinc at SW-3.

None of the exceedances have been attributed to landfill related impacts. The trigger mechanism was not triggered in 2021.

Expansion Feasibility Study

The proposed expansion at this site would involve the addition of 30,000 to < 40,000 m³ of waste disposal capacity.

The proposed expansion is to be completed in 5 phases, with final cover applied to completed areas following each phases' completion.

A sewage works consisting of swales for the collection and transmission of stormwater to one of two stormwater control ponds is being proposed. Both ponds will be affixed with outlet control structures.

Comments/Recommendations

- The consultants indicate that the PWQO exceedances measured in 2021 were minor and not attributed to the landfill related impacts. I agree with this assessment.
- The consultants have recommended a reduction in the surface water monitoring locations to include the background station (SW-4) and SW-5 only. I support this recommendation. Following the completion of the recommended topographic survey it would be preferable to establish a surface water monitoring station(s) down-gradient of the landfill in closer proximity to the waste disposal site. If a surface water monitoring location exists between SW5 and the landfill, then I would support removing SW-5 as well, since it is located a substantial distance from the WDS.
- The consultants have also recommended that the sampled parameters list be increased to match Schedule 5, Column 3 of the Landfill Standards. I support both these recommendations, however I recommend the inclusion of calculated unionized ammonia. I would also suggest that the surface water sampling program be reduced to twice per year (spring, fall) to match the groundwater sampling program.
- The consultants have recommended that a new topographic survey be completed and that additional surface water station locations will be identified as appropriate. I agree with this recommendation and would further add that a monitoring sample location be established at the outlet of the proposed surface water control ponds (sewage works outlets).
- The topographic survey should detail the outlet flow paths from the stormwater works.
- Specific design details for the stormwater works should be provided for review.

The existing waste disposal site has not been found to be causing a risk to surrounding surface water features. In my opinion the risk of surface water impacts to area surface waters from the proposed expansion is low. I support, in principle, the proposed expansion.

Please contact me if you have any questions regarding the above comments.

Original to be Signed

Mark Phillips

ec: C. Klein, Tech. Support Manager, MECP V. Castro, (A)WRU Supervisor, MECP E. Tieu, Ottawa District Supervisor, MECP Groundwater Unit Files (A. Bos) ECHO



Jp2g No. 22-6213A

January 25, 2023

Ministry of the Environment, Conservation and Parks 2430 Don Reid Drive, Unit #103 Ottawa, ON K1H 1E1

Attention: Thandeka Ponalo Sr. Environmental Officer

Re: Black Donald WDS ECA No. A362202 Expansion Feasibility Study

Dear Thandeka:

We acknowledge receipt of the Groundwater review comments dated January 6, 2023 and the Surface Water review comments dated January 11, 2023 on our October 25, 2022 submission.

The following conclusions and recommendations from the memorandums have been reproduced (in part) in **bold** for convenience, and our response provided:

Alija Bos Hydrogeologist January 6, 2023 review of:

- 2021 Annual Report March 21, 2022 by Greenview Environmental Management
- Expansion Feasibility Study October 25, 2022 by Jp2g
- 1. The updated monitoring program will continue to sample the monitoring wells as per the ECA Schedule "B" with the addition of the following:
 - A bi-level monitoring well within overburden (if available) and bedrock located east of landfilling area towards MW08-7
 - A bedrock monitoring well in the MW08-7 location. Request a cross section drawing of the waste area (historical and proposed) including elevations
 - A replacement well for BH-3

Jp2g have prepared an estimate of probable costs to complete the new well installations in 2023 for consideration of Council. Regarding the plan and cross section drawing, there is additional survey required of the expansion area scheduled in the spring 2023, these plans will be included in the 2023 Annual Report.



Ottawa 1150 Morrison Dr., #410 Ottawa, ON, K2H 8S9 T: 613-828-7800 Ottawa@jp2g.com Pembroke 12 International Dr. Pembroke, ON, K8A 6W5 T: 613-735-2507 Pembroke@jp2g.com **Arnprior** 16 Edward St. S., #53B Arnprior, ON, K7S 3W4 T: 613-828-7800 Arnprior@jp2g.com



2. The water quality analysis will be expanded to Schedule 5 Column 1 of the Landfill Standards (1998). Upon new well installation and sampling an updated trigger mechanism and contingency plan is recommended. Jp2g will conduct the 2023 monitoring with the more comprehensive set of parameters first with the existing wells and then to include the new wells when installed. The current trigger and contingency plan is detailed in Section 6.2 of the Design, Development and Operations Plan December 2010. An updated trigger mechanism and contingency plan will be provided based on the more recent sampling results and will be presented in the final Expansion Feasibility Study.

Mark Phillips Surface Water Scientist January 11, 2023 review of:

- 2021 Annual Report March 21, 2022 by Greenview Environmental Management
- Expansion Feasibility Study October 25, 2022 by Jp2g
- Memo by B. Metcalfe on the 2015 AMR
- Memo by A. Bos on the 2021 AMR
- 1. I support the reduction of sampling locations to include SW-4 and SW-5. Following completion of the topographic survey it is preferable to establish a monitoring station(s) closer to the waste disposal site.

Jp2g will conduct the survey in the spring 2023 and observe the spring freshet for potential locations.

2. I would further add that a monitor sample location be established at the outlet of the proposed surface water control ponds (sewage works outlets).

The Greenview Design, Development and Operations Plan December 2010 does not include control ponds but drainage ditches along the north-eastern portion of the fill area adjacent to Hydro Dam Road and at the southwest corner of the site. The final Expansion Feasibility Study will include an assessment of the requirement for new surface water controls.

3. The topographic survey should detail the outlet flow paths from the stormwater works.

Agreed.

4. Specific design details for the stormwater works should be provided for review.

The final Expansion Feasibility Study will provide adequate detail to confirm surface water flow paths and additional monitoring locations to assess environmental compliance.

Yours truly, Jp2g Consultants Inc. ENGINEERS • PLANNERS • PROJECT MANAGERS

Kevin Mooder, MCIP RPP Principal | Environmental Services

cc Leonard Emon



APPENDIX 2

Onta	rio 🕅	Ministry Conserv	/ of the Env	vironment, Parks	Well Ta	ag No. (Pla	ce Sticker	and/or	Print Belo	ow)	Regulatio	n 903 (Ontario	Well	Record
Measuren	nents recor	ded in:	Metric] Imperial		15060	220						Pa	ige__	of
Well Ow First Name	v ner's Info e	ormation	Last Name/	Organizatio	n				E-mail Ad	dress					
Mailing Ad	Inshi	OFC	Weate	rm	dauy	ista			- main ra	urooo				by N	Nell Owner
19 Pr	Impl/S	A. P.O.	201 18	D			me		Province		Postal Code	e +)	Telepho	ne No. (in	c. area code)
Well Loc	ation	on (Street Nu	mbor/Name			Taurahia									
H	udio	Dan	Road			lownsnip					Lot		Conces	sion	
County/Dis	strict/Municip	pality				City/Town/Vil	llage	~				Provi Ont	nce tario	Post	tal Code
UTM Coor	dinates Zon	e Easting		lorthing		Municipal Pla	an and Subl	ot Nun	nber			Other	r	F.C.	J J I HL
NAD Overburd	8 3 len and Be	drock Mater	a b 8 f	onment S	ealing Rece	ord (see instr	uctions on th	ne bacl	k of this for	<u>n)</u>	-				
General C	Colour	Most Com	mon Materia	1	Ot	her Materials	;			Genera	al Description	ı		De From	epth (m/ft) To
bra	10	Sand			X									Ø	11,
greu	$\left \right ^{(1)}$	Jeonit	ie							a de la construcción de la constru				11,	65'
	3										-				
) Mal'	sent	- DOCT.	to in	cluch	-01	-							
		Sund) XI	and	ic II'	1 Calst	C1			_			10123		
-		n e)													
									and the second se						
								×							
Depth Se	et at (m/ft)		Annula Type of Se	r Space alant Used		Volume	Placed	Afte	r test of we	R Il vield, w	esults of W	ell Yie	d Testir		Recovery
From		21-1-1	(Material a	nd Type)		(m ⁴	3/ft ³)		Clear and Other spe	sand fre	e	Time (min)	Water Lo	evel Time	Water Level
10	57	218 Y	de p	ilig ;				If pu	imping disc	ontinued,	give reason:	Static	(/ ((
59	105	td e	SIN(A	sand						1		1	/	1	
								Pum	np intake se	et at (m/ft)		2	/	2	
Meth	nod of Cor	struction		_	Well Us	e		Purr	nping rate (l	/min / GPI	N)	3	1	3	
	ol	Diamono		blic		rcial	Not used	Dura	ation of pun	nping		4		4	
Rotary (C	Reverse)			restock	Test Hol		Monitoring		hrs +	mir	י /	5		5	
Air percus	ssion			gation lustrial		& Air Condition	ning	Fina	l water leve	el end of p	oumping (m/ft)	10		10	
_] Other, sp	Con	struction R	ecord - Cas	ner, specity	the second s	Status	of Well	If flow	wing give ra	ate (I/min/	GPM)	15	1	15	
Inside Diameter	Open Hole	OR Material	Wall	Dept	h (m/ft)	Water S	upply	Reco	ommended	pump de	epth (m/ft)	20	1	20	
(cm/in)	Concrete, F	Plastic, Steel)	(cm/in)	From	То	Test Hol	e	Reco	ommended	pump ra	te	25		25	
1.5	PVL		025"	Ø	55'	- Dewater	ie Well ing Well	(l/mi	n/GPM)			30		30	
				-		Observa Monitori	ition and/or ng Hole	Well	production	(I/min/GP	M)	40		40	
						Alteratio	n Iction)	Disin	fected?			50		50	
	Con	struction R	ecord - Scr	oon	1	Abandor	ned, ent Supply		Yes I N		Man of We		ation	00	
Outside Diameter	Ma	terial	Slot No.	Dept	h (m/ft)	Water Q	ned, Poor uality	Plea	ise provide	a map b	elow followin	ng instru	uctions o	n the bac	k.
(cm/in)	(Plastic, Gaiv	anized, Steel)		From	То	specify	ied, otner,			11	M	2)		>
1.75	PNL		010	55'	65	Other, sp	pecify		1	1	10	5	1)
		Water Det	alle						(1	//		10		/
later found	at Depth	Kind of Water	Fresh	Untested	Depti	n (m/ft)	Diameter			(Wing)	\mathcal{A}		2	٨
(m/ Vater found	/ft) Gas	Other, spe	cify Fresh	Untested	From				1	12	0	11))(~ ~	1
(m/	/ft) Gas	Other, spe	cify			15T	1411) 🦉	TPC		H.	Yor	TH
Vater found	ft) Gas	Kind of Water	: [_]Fresh [cify	Untested			1	X	7726	$\overline{\mathcal{D}}$	HyduDin	71	I.	BY	Th
	We	II Contracto	or and Well	Technicia	n Informati	on		1	0-0	15	Rd.	1	E.	3	(1, 2)
usiness Na	ame of Well		4 9 (hA	trata	X II	Contractor's	Licence No.	T	ix	U		/	li	N	2D
usiness Ad	Idress (Stree	et Number/Na	me)	TRUT	Mur	nicipality		Com	ments:		11				
rovince	Po	stal Code	Business	E-mail Add	Iress	NUTE	, XIL	M	IMI X	nolde	s-the-	107	1		
us.Telephor	ne No. (inc. a	rea code) Na	me of Well T		ast Name	(000		Well o	owner's [nation	Date Pack	age Delivere	d	Min Audit No	istry Use	e Only
1132	31522	331	Filli	001	Scott	$\gamma_{1} \wedge$		delive	age ered	Y Y Y Date Worl	Y M M I			41	4110
33	Licence N	o. Signature	of lechniciar	n and/or Co	ntractor Date	Submitted	1/100		No	RIVIS	R 1/10/2	B	Received		
06E (2020/06) © Queen's	Printer for Onta	rio 2020	0	C	Contract	or's Copy	/	(ADCINA				interna a se	

Ontario 😵	Ministry of the Environme Conservation and Parks	ent, Well Tag	g No. (Place Sticker	and/or Print Below)	1		Well F	Record
Measurements recorded	in: 🗌 Metric 🗹 Imperi	al	A386271		Regulation	903 Ontario	Water Res	ources Act
Well Owner's Inform	ation]	F¢	ige	
Township (of Creater	ation Modawa	iska	E-mail Address			U Well 0	Constructed ell Owner
Mailing Address (Street Nu	R.D.Box 180	N	Aunicipality	Province	Postal Code	HIC	ne No. (inc.	area code)
Well Location	Street Number/Name)	 TT	ownebio		HOPN	1911	<u></u>	
34 Hidlo	Dam Road				LOT	Conces	sion	
			(alaboone			Province Ontario	Postal	SUIHO
NAD 8 3 8	DEBBBB	1015118	Iunicipal Plan and Subl	ot Number		Other		
Overburden and Bedroc General Colour M	ok Materials/Abandonmen	t Sealing Record	rd (see instructions on the restructions on the restrict of	ne back of this form) Gene	ral Description		Dept	th (m/ <u>ft</u>)
Drawn (u	ddes	Sav	d			-	From	31
MULTIN SON	rd st cond						3'	25
aven an	ante						25	53
							30	2.5
	Immiset on a	orte					1.001-0-0	
Depth Set at (m/ft)	Annular Space Type of Sealant Us	ed lateral sectors and sectors	Volume Placed	After test of well yield, w	Results of We vater was:	Il Yield Testin Draw Dowr	g Re	covery
() 41' 3	(Material and Type)	(m³/ft³)	Clear and sand fr	ee	Time Water Le (min) (m/ft)	evel Time ((min)	Water Level (m/ft)
41 55 #	2 Silicasan	4		If pumping discontinued	d, give reason:	Static Level	/	
				Pump intake set at (m/f	t)	1	1	
Mothed of Capatry	ution	14/- 1/ 17		Pumping rate (I/min / GF	PM)	3	3	- (1)
	Diamond Dublic		ial 🗌 Not used	Duration of pumping		4	4	
Rotary (Conventional)	Driving	Test Hole	Air Conditioning	hrs + m	in	5	5	
Air percussion	Industrial	ify	Air Conditioning			10	10	
Constru	iction Record - Casing)anth (m/ft)	Status of Well	I fill flowing give rate (i/min	(GPM)	20	20	
Diameter (Galvanized, Fib (cm/in) Concrete, Plastic	reglass, Thickness c, Steel) (cm/in) From		Vvater Supply Replacement Well Test Hole	Recommended pump of	lepth (m/ft)	25	25	
15" PUC	.25'* O	42'	Recharge Well Dewatering Well	Recommended pump ra (I/min/GPM)	ate	30	30	
			Observation and/or Monitoring Hole	Well production (I/min/G	PM)	40	40	
			Alteration (Construction)	Disinfected?		60	60	
Constru	ction Record - Screen		Insufficient Supply Abandoned, Poor		Map of Wel	I Location		
Outside Diameter (cm/in) (Plastic, Galvanize	ed, Steel) Slot No. From	repth (m/ft) n To	Water Quality Abandoned, other, specify	Please provide a map	below following	instructions of	n the back.	A
1.75' PNL	010 42	52'	Other specify	All'S	131	utility		-AN
						ſ,	300	~ ''
Water found at Depth Kind	of Water: Fresh Untes	ted Depth	(m/ft) Diameter	Hudra		IN	.<)	h
(m/ft) Gas Of Water found at Depth Kind	ther, specify of Water:FreshUntes	ted Ø	32. 9.	12 Ju	m=1/7	(C. C.	\sim) h
(m/ft) Gas Of Water found at Depth Kind	ther, specify of Water:FreshUntes	ted 33	55' 4"	Leto	Treed !!	41		{
(m/ft) Gas Of	ther, specify				5 11	y	r	15
Business Name of Well Contr	ractor	Well C	Contractor's Licence No.	141	1	4	~	
Business Address (Street Nu	mber/Name)	Munic	cipality	Comments:	11			
Province Postal C	Code Business E-mail	Address	MONTERVE.				the based	
Bus. Telephone No. (inc. area co	ode) Name of Well Technicia	n (Last Name, Fir	rst Name)	information package	Kage Delivered	Audit No.	stry Use (Daily 7777
Well Technician's Licence No. Si	ignature of Technician and/or	Contractor Date	Submitted	Date Wo	rk Completed			
2006E (2020/06) © Queen's Printe	er for Ontario, 2020	ARK	Contractor's Copy		N M M B	D Received		

Black Donald Waste Disposal Site

Expansion Feasibility Study 2024 Township of Greater Madawaska

September 5, 2024 Revised October 10, 2024

Jp2g Project # 22-6213A





Table of Contents

Dist	ributi	on Listi					
1	Intro	duction1					
2	MECP Consultation Summary2						
3	Legal Requirements2						
4	Envir 4.1 4.2 4.3 4.4	onmental Requirements3Surface Water Monitoring3Groundwater Monitoring4Landfill Gas Monitoring4Natural and Cultural Heritage Features4					
5	Oper 5.1 5.2 5.3	ational Requirements4Historical Overview5Proposed Expansion7Public Consultation7					

Figures

Figure 1	Regional Location Plan
Figure 2	Historical Surface Water Monitoring Locations
Figure 3	Site Plan

Drawings

Drawing 1 Existing Conditions Plan 202	23
--	----

- Drawing 2 Proposed Final Contours
- Drawing 3 Cross Section

Appendices

- Appendix A MECP Correspondence
- Appendix B Legal Documents
- Appendix C Initial Environmental Impact Study
- Appendix D Stage I Cultural Heritage Assessment



Distribution List

PDF	Association / Company
1	Township of Greater Madawaska
1	Ministry of the Environment, Conservation and Parks - Ottawa District Office
1	Jp2g Consultants Inc.

Jp2g Consultants Inc. Signatures

Aruni

Report Prepared By:

Quentin Sprunt Junior Environmental Tech

Report Reviewed By:

Kevin Mooder, MCIP RPP Manager | Environmental Services

HAdrew Bapp

Report Reviewed By:

Andrew Buzza, P.Geo Senior Hydrogeologist



1 Introduction

The Black Donald Waste Disposal Site (WDS) is located in Part Lot 9, Concession 2 and 3, within the geographic Township of Brougham, now in the Township of Greater Madawaska at 34 Hydro Dam Road. Under ECA No. A411902 Notice No. 2 dated October 12, 2001 the site was described as a 1.2 ha landfill site. Subsequently the Township acquired additional property for a total site area of 21.36 ha. As part of the Township's waste management strategy, the Black Donald WDS was selected to receive bulky waste for disposal while the proposed waste transfer stations accepted domestic waste, as shown on **Figure 1**.

The Black Donald WDS ceased receiving regular non-hazardous solid domestic waste in April 2010. Under the amended ECA No. A411902 Notice No. 3 issued January 24, 2013 the landfill site receives construction and demolition and bulky waste (C&D waste as defined in the ECA) to be stockpiled and ground for disposal. The ECA also allows the receipt of non-hazardous solid domestic waste on an emergency basis, and leaf and yard waste for composting. Site development is detailed in the Design, Operations and Development Plan dated December 22, 2010 (Greenview, 2010).

The total site capacity of the site including waste, daily, interim and final cover is 46,785m³ (ECA Condition 18). As of November 2010 the remaining capacity was 12,442m³ (Greenview, 2010).

On November 25, 2022 the Township received an Inspection Report dated November 21, 2022 by Thandeka Ponalo, MECP Environmental Compliance Officer which reviewed the 2021 Annual Report (Greenview, 2022) and summarized observations during a site visit. The main observation/corrective action to address non-compliance was related to the limited remaining capacity.

The 2021 Annual Report reported there was an estimated remaining site capacity of 4,400m³, and based on an average (mean) five year fill rate (2017 to 2021) of 897m³ is equivalent to a remaining site life of approximately five years.

However, Greenview did not address the fact that the 2021 landfilling rate was approximately 2,078m³ and with similar quantities landfilled the site could have a life expectancy of just over two years.

The action requested by the Ministry included:

- 1. The Township shall conduct an assessment of the approved waste disposal area to determine the accurate remaining capacity of the site.
- 2. The Township shall submit to the Ministry a drawing of the landfilling area that shows the areas that have been overfilled in relation to the approved contours.
- 3. The Township shall submit to the Ministry an action plan to address how the site will be brought back into compliance in relations to the approved landfill design and capacity limits.

A copy of the Site Inspection is included in **Appendix A**.

Greenview completed the 2022 Annual Report dated February 2023 but did not acknowledge the MECP Inspection Report. During the summer 2022 the Township had a tender call for the environmental monitoring and reporting for all five (5) of their waste disposal sites. Jp2g Consultants Inc. were successful and also initiated an Expansion Feasibility Study for the Black Donald Landfill Site in August 2022. However, Greenview did not provided AutoCAD files of the previous design and surveys, so supplemental capacity analysis was completed for the 2023 Annual Report dated March 26, 2024 and this Feasibility Study.



2 MECP Consultation Summary

The MECP consultation was coordinated through Thandeka Ponalo Environmental Compliance Officer Ottawa District Office. Jp2g filed a summary of the proposed expansion dated October 25, 2022 detailing the site's capacity, ECA requirements, legal, environmental and operational considerations. The following lists the relevant correspondence with MECP that occurred:

January 6, 2023 TSS Groundwater January 11, 2023 TSS Surface Water January 25, 2023 Jp2g response December 29, 2023 Jp2g status update

Copies of these documents are included in Appendix A.

The following sections highlight key comments and issues to address as a result of the MECP consultation, and an assessment of requirements to be included in the supporting documentation for an amended ECA identified in the Expansion Feasibility Study.

3 Legal Requirements

This section includes a review of the ECA conditions as they may affect the expansion proposal. A copy of the ECA is included in documentation provided in **Appendix A**.

Site Description

A 1.2 ha landfilling area within a total site area of 21.36 ha. The expansion will increase the existing 0.9 ha landfilling area by 5875m² to 1.49 ha.

<u>General</u>

Conditions 1 to 13 maybe updated to reflect current Ministry requirements.

Site Operations

Condition 15 to be amended to reflect the new Design and Operations (D&O) Report for the expansion.

Condition 18 to be amended to reflect the new total capacity of the site without final cover.

Condition 26 will reflect the proposed surface water and groundwater monitoring program described in **Section 4.0** of this report and to be inserted as a new Schedule in the amended ECA.

Condition 27 to be amended to reflect current Annual Report requirements.

Condition 28 to be amended to reflect the Ministry requirements to approve changes to the monitoring plan in the future.

Condition 29 to reflect the surface water and groundwater trigger and contingency plan to be included in the new D&O Report.

Buffer Area and Contaminant Attenuation Zone

Conditions 30 to 32 were satisfied. Copies of the legal survey and Certificate of Prohibition are included in **Appendix B**.

Site Closure

Condition 35(b) to be amended to reflect the proposed design in the D&O Report.



Leaf and Yard

Condition 36 to remain

<u>Cover</u>

Condition 37(c) the title reflect alternative intermediate cover?

We acknowledge that the MECP may opt to issue an amended ECA which revokes and replaces all previously issued ECAs.

4 Environmental Requirements

This section includes a review of the water quality and landfill gas monitoring program and any measured or potential impact on the surface water and groundwater quality and risk due landfill gas. In addition, an assessment of the expansion's potential impact on other natural heritage features is reviewed.

4.1 Surface Water Monitoring

ECA Schedule "B" as amended January 24, 2013 identifies four (4) locations SW-3, SW-4, SW-5 and SW-6 to be sampled three (3) times a year. A site specific list of parameters for analysis are included.

In accordance with the October 25, 2022 submission to MECP, Jp2g recommended that SW-3 and SW-6 are removed as they are located a significant distance from the landfilling area and laboratory analysis be expanded to include the parameters in Schedule 5 Column 3 of the Landfill Standards.

The MECP response from Mark Phillips, Surface Water Specialist dated January 11, 2023 agreed to remove the sampling locations and recommended after more detailed topographical survey to establish a surface water monitoring station downgradient and closer to the fill area. Mr. Phillips also agreed to the laboratory analysis.

All the surface water locations identified in the ECA Schedule "B" do not effectively monitor the potential impact to surface water resources in proximity to the site. Jp2g reviewed the historical monitoring locations including those established in the initial investigation, established by Golder Associates Ltd. and the monitoring locations conducted by Greenview. These are illustrated on **Figure 2**. Jp2g conducted a thorough site review and propose the following locations as illustrated on **Figure 3**:

- Keep former SW-2 and SW-5 locations to monitor flow to the southwest from the fill area.
- Add SW-8 as the new background location.
- Add SW-9 to monitor any surface water flow to the northeast from the fill area.
- Keep former SW-4 located downgradient from SW-8 and SW-9.

The MECP review dated January 11, 2023 requested that the additional topographic survey should detail the outlet flow paths for proposed stormwater works. The 2001 design by Jp2g Consultants Inc. proposed a surface water control pond and outlet in the northwest corner of the landfilling area. There is a natural ravine running parallel to the hydro corridor in this location. A surface water sampling location (SW-2) was established however to date has not experienced any significant flow, Golder (2007) recommended it be removed from the monitoring program and it is not included in Schedule "B" of the ECA. We propose to include it in the amended ECA as expansion of the fill area may increase surface water runoff in this direction. There are no other surface water runoff features in close proximity to the landfilling area. No stormwater controls are proposed.



The details of the surface water monitoring program is described in the D&O Report.

4.2 Groundwater Monitoring

ECA Schedule "B" as amended January 24, 2013 identifies seven (7) monitoring wells to be sampled in the spring and fall. A site specific list of parameters for analysis are included.

In accordance with the October 25, 2022 submission to MECP, three (3) additional wells were installed and laboratory analysis has been expanded for all monitoring wells to include the parameters in Schedule 5 Column 1 of the Landfill Standards.

The MECP response from Alija Bos, Hydrogeologist dated January 6, 2023 agreed to the additional monitoring wells, the more comprehensive water quality analysis for all wells, and that the trigger mechanism is to be updated to support the expansion. The reviewer also requested a cross section of the waste area, historical and proposed (see **Drawing 3**).

BH-3 has been decommissioned as it is located within the proposed landfilling area expansion, the monitoring well locations are illustrated on **Figure 3**.

The details of the groundwater monitoring program and trigger mechanism is described in the D&O Report.

4.3 Landfill Gas Monitoring

Gas monitoring is currently not part of the ECA. We propose monitoring at all monitoring wells during each groundwater sampling event as described in the D&O Report.

4.4 Natural and Cultural Heritage Features

Greenview Environmental Management (Greenview) completed a Preliminary Landfill Expansion Feasibility Study dated August 31, 2007 which included a natural and cultural heritage assessment for the Black Donald WDS.

The Initial Environmental Impact Study completed by Snider's Ecological Services is included in Appendix C.

The Stage I Cultural Heritage Assessment completed by C.R. Murphy is included in **Appendix D**.

While both of these studies recommended additional investigation it was to support a major expansion of the site to accommodate domestic waste. As the site only accepts C&D waste and the expansion is in an area previously disturbed additional study was deemed unnecessary.

The Township has not consulted with the First Nation and Metis communities as the expansion is within the limits of municipal property.

5 Operational Requirements

This section includes a review of historical records and the proposed expansion in consideration of any negative impacts on-site or on adjacent lands, and concerns with the landfilling operations.



5.1 Historical Overview

ECA No. A411902 was issued March 27, 1980 for a 1.2 ha dump site to accept domestic and 5% other wastes, limited to scrap metal, brush, lumber and construction debris. To reflect changing operations the following amendments were issued by the Ministry:

Notice No. 1 October 22, 2001 – To increase the service area to include the Township of Greater Madawaska and require an updated site development and operations plan for the 1.2 ha landfill site.

Notice No. 2 July 12, 2002 – For the construction, operation and maintenance of the site in accordance with the Site Development and Operations Plan prepared by Jp2g Consultants Inc. dated January 2001. The total volumetric capacity of the site including waste, daily, interim and final cover is 46,785m³.

Notice No. 3 January 24, 2013 – For the use and operation of the site for disposal of construction and demolition and bulky waste (C&D waste) for disposal, and leaf and yard waste for composting in accordance with the Design, Operations and Development Plan prepared by Greenview dated December 22, 2010.

Landfilling Operations

The Black Donald WDS receives C&D Waste from municipal vehicles from the Township's waste transfer sites and Township approved haulers only, under the supervision of municipal staff. The normal hours for receiving waste at the site are 7 am to 9 pm.

The current design of the landfilling area is consistent with the Jp2g 2001 application:

- maximum side slopes of 25% (4H:1V)
- peak elevation of 108m (assumed elevation)
- maintain 15m buffer from Hydro transmission corridor and a 30m buffer to Hydro Dam Road

C&D waste is deposited on the fill area and ground once per year, spread and compacted.

<u>Signage</u>

A sign at the entrance stating the status of the site to be maintained.

Inspection and Record Keeping

Monthly inspect the status of the access road, gate, fencing and the C&D waste stockpile. Waste delivery screening of haulers loads and type of load is recorded by Township staff. Records of the inspections and waste deliveries are kept at the Municipal Office and reported in the Annual Report.

Remaining Capacity

The Greenview Design Operations and Development Plan presented the following remaining capacity figures: as of October 2019 14,926m³ and as of November 2, 2010 12,442m³. Based on the review of available past Annual Reports the following summarizes landfilling operations and remaining capacity estimates. Greenview determined the remaining capacity by subtracting the annual landfill volume from the previous years estimate. The 2023 remaining capacity estimate by Jp2g was based on comparing the landfilled waste mound as shown on **Drawing 1** to the 2010 design without final cover.
Year	Annual Landfilled (m³)	Remaining Capacity (m ³)	Estimated Years	Waste Summary		
2009	4909	14,926	3	2393 cars 2494 trucks 1145 trailers 27 single axle 11 tandem 16 tri-axle		
2010	2484	12,442	12,442 5			
2011	11,341					
2012	1087 with cover	10,337	9	33 tri-axles 1 trailer		
2013	1197	9140	7.6	28 tri-axles 4 trailers		
2014						
2015	256	9320	9	12 tri-axles 1 bin		
2016	382	8937	10	3 bins 510m ³		
2017						
2018						
2019						
2020	759	6478	12	25 tri-axles 2 bins 410m ³		
2021	2078	4400	5	52 tri-axles and 786m ³ unprocessed C&D waste		
2022	826	3575	4	34 tri-axles and 700m ³ unprocessed C&D waste		
2023	857	2718	3	0		
2024	0	2718	3	0		

The 2023 Annual Report reported that there was 2718m³ of capacity remaining after the waste received in 2022 was ground and landfilled. No waste was received in 2023 and 2024. If the site received 857m³ of landfilled waste the life expectancy would be 3 years, however if the quantity increased the site capacity would be exhausted without approval for the expansion.



5.2 Proposed Expansion

The 2024 design is based on a geodetic elevation survey, rather than the assumed elevation of 100m at benchmark #1 near the site entrance which was used in the 2001 design. Under the current ECA the 1.2 ha landfilling area has a total volumetric capacity including waste, daily interim and final cover of 48,785m³ (ECA Condition 18). The actual fill area is 0.9 ha. The proposal is to extend the fill area to the southwest over an area of 5,875m² providing an additional 36,500m³ of capacity (excluding final cover) as shown on **Drawing 2**.

A phased landfilling approach will be conducted at the Black Donald WDS to progressively match into the existing 4:1 slope along the southwesterly portion of the landfilling area.

Phase 1 – to apply clean fill in the northwest and northeast corners to establish a minimum base elevation of 276m above sea level.

Phase 2 – landfilling from the northwest to the northeast up to the 278.5m elevation.

Phase 3 – landfilling from the northwest to the northeast over Phase 2 up to the 281m elevation.

Phase 4 – Landfilling from the northwest to the northeast over Phase 3 up to 283.5m elevation.

Phase 5 – Landfilling from the northwest to the northeast over Phase 4 up to the final design contour elevation of 286m.

Drawing 3 illustrates the proposed cross section of the expansion, this drawing will illustrate the Phases in the D&O Report.

As the new final side slopes of 4:1 are achieved the application of final cover, including 150mm of topsoil or equivalent will be applied and will naturally revegetate. If erosion occurs or areas do not revegetate, they may have to be stabilized and seeded.

5.3 Public Consultation

The Township of Greater Madawaska will provide notice of the application for expansion through local media including newspaper and the website, and a mailing to neighbouring landowners which includes a few privately owned properties to the west on Black Donald Road, the rest of the lands are Crown.

End of report.



Figures and Drawings





SW-4 Greenview

Legend

	F
£	`

Road

踠 Vegetation

30m Buffer

Ombody Amplitude Physics A

• SW-4 Surface Water Locations

Contamination Attenuation Zone (CAZ)

MW08-6 Destroyed Well

NOTES : WELL LOCATION FROM HANDHELD GPS DURING THE SPRING 2023 SAMPLING SOURCE GREENVIEW 2022 AMR FOR REFERENCE ONLY 1:4,000

0 m	80	160	_
	40 1	20 2	00 m
DRAFTED: QS		PROJECT No.:	22-6213A
CHECKED: KM		REVISION DATE:	2024-07-02
CHECKED: KM	APPROVED: KM	REVISION No.:	
SCALE: Approx	Scale 1: 4000	Figure :	2





ģ

S







Appendix C Borehole Logs

02/01/2006 WED 15:54 FAX 705 652 0743 SGS

-

-

-

[]]

F proved (Friday) (

Las 1777 Januard

turner of a comme

Lassian and Lassian

HYDRC Black D	OGEC	DLOGICAL INVESTIGATION	PROJECT:	21-373	•				AT		13 Ju GIST	l ly 2001 BJS		1
	RAPHY			ror TLS 4BER			SAM			V / 1		95.4	 w/	4
DEPTH (m)	STRATIG	STRATIGRAPHIC DI	SCRIPTION	MONIT DETAI	NUMBER	TYPE	N VALUI	& WATEI	% REC	& RQD	NV.	ALUE		∛: (?) r−
		<u>SAND</u> Reddish and medium brown fine san medium and coarse sand, trace fine a silt, subtle laminations, moist, compa	d, trace to some nd coaixe gravel, trac	c Hill Pill	1	SS	20	2	80 70			143 GU	<u>10 2</u>	9.
1.5		-occasional cobbles observed below (n.		. 3	SS IS	37/	8	50	•		• • • • • • • •	4	•
2 .	NNRSESSION	MARBLE REDROCK Light grey to whitish marble bedrock appearance, some oxidation along fir 1.7 m and 3.1 m. Weathered section between about 1.7 m and 1.9 m. Op- oxidation at about 2.10 m to 2.12 m.	, massive, pepper ictures between about - broken rock an fracture with Minor oxidation		4	HQ	0.08.		100	78				
3	BIBBBBBBBB	along fracture at about 2.8 m.	· · ·		5	HQ HQ			96	200		· · · · · · · · · · · · · · · · · · ·		
• 4 •		·					•					· · ·		•
5 -		· · ·	. ·		• 6	HQ			106	96 -		· · ·		
6.					7	NA REFERENCE			100	82		· · · · · · · · · · · · · · · · · · ·		
7 -		· · ·			•							· · ·		
7.7		Borchole terminated at 7.69 m in ma	rble bedrock.		-						• • • •			
			•									• • • • • • • •		
											· ·	• •		

Gartner Lee Limited

图 003/005



Linkowski

havious

-



Ser.

Nimi

in the second

......

The second

AL AND



E Gr ENVIRON enview Environmental leak Avenue, P.O. Box 10 roft, Ontario KOL 1CO 13) 332-0057 13) 332-0057 13) 332-1767 Juitions@greenview-enviro SUBS	Project No.: 102.08.014 Project: Black Donald Waste Disposal Site Client: Township of Greater Madawaska Location: See Site Plan SAMPLE								
epth Symbol	Description	No.	Туре	% R	SPT N-Value) 15 30 45 60	Well Completion Details	- Comments		
	Ground Surface						Stick-up = 0.89 m		
	Top Soil Dark brown, organic, dry, loosely compacted. Fine to Medium Sand Light brown to grey, fine to medium	2	AS HQ	40 80			Bentonite Chips		
	Sand, dry, loosely compacted. Marble Bedrock Light grey to white with black specks, marble bedrock.	3	нQ	100					
	Oxidized fractures from 1.83 m to 2.82 m, and from 11.25 m to 12.50 m. Mostly competent, fractures from 6.55 m to 11.12 m.	4	HQ	90					
		5	HQ	100			Silica Sand		
		. 7	HQ	100					
9		8	. HQ	100			Well screen = 3.0 m x 0.05 m		
	• · · · · · · · · · · · · · · · · · · ·	9	HQ	100	· · · · · · · · · · · · · · · · · · ·		Water lavel lung		
		10	HQ	100			2008 = 12.85 m.		
	End of Borehole				· · · · · · · · · · · · · · · · · · ·	Logged By	: J. Bailey		





	<u> </u>					Log of Mo	onitoring Well:	MW08-6				
Z		MENTAL MANAGEMENT	F		- Risor	Donald Wasta Dieno	sal Site					
Greenview E 59 Cleak Aven	Areenview Environmental Management Limited 9 Cleak Avenue, P.O. Box 100 Jancroft, Ontario KOL 1CO (613) 332-0057 1 (613) 332-1767			Project: Diack Donaid waste Disposal Sile								
Eancrott, Ontai t: (613) 332-00 f: (613) 332-17 e: solutions@o				Client: I ownship of Greater Madawaska								
				Locati	on: See	Site Plan	·					
	SUBSI	JRFACE STRATA PROFILE		T	SAN	PLE						
Depth	Symbol	Description	No.	Туре	% R	SPT N-Value	Well Completion Details	Comments				
					1	0 15 30 45 60	-					
-4 -4 -2								Stick-up = 0.87 m				
	~~~	Ground Surface	<u> </u>					Concrete				
		Top Soil Dark brown, organic, dry, loosely			25							
		Fine to Medium Sand Light brown, fine to medium sand, dry, loosely compacted.	2	HQ	100			Bentonite Chips				
որորորություն 60 8		Marble Bedrock Light grey to white with black specks, marble bedrock.	2	H0	100	· ·						
10 3		Heavily fractured from 0.05m to 1.45m.										
12		Oxidized fractures @ 3.81m, 4.17m, 5.28m, 5.59m, and 7.48m.						Silica Sand				
nhalahahah			4	HQ	100							
16 18 18 20 11 20			5	HQ	95		ź	:Water level June 5, 2008 = 5.50 m				
22 24 24 24 24			6	HQ	100							
28 thinking			7	HQ	100							
32 talahala 32 talahala 34 talah			8	НQ	100							
36	11											
Dri	lied By: La	ntech Drilling Ltd.					Logged By	r. J. Balley				
D-1	ll Mathadi	CME 75 Diamond Bit Coring					Checked E	v: T. Peters				

Sheet: 1 of 2

reenview E O Cleak Avenu		PENTAL MANAGEMENT		F	Project Project	: <b>No.:</b> 1	102.0 k Dor	Log 8.014 hald Wa		onitoring Well: N osal Site	/W08-6
ancroft, Ontar (613) 332-00 (613) 332-17 solutions@g	rio KOL 1CO 157 767 greenview-environm	neņtal.ca	. <b>.</b>		-lient: -ocati	iowns on: Se	e Sit	e Plan	er iviadav	Jaska .	
•	SUBSU	RFACE STRATA PROFILE				SAI	MPL	1			
Depth	Symbol	Description		No.	Туре	% R		SPT N-Vali		Well Completion Details	Comments
							0	15 30 	45 60		
				9	HQ	100					
2 2 4 4				10	HQ	100					
		•		11	HQ	100					
	6		•	12	HQ	100		*****			
	8	•		13	HQ	100		*****			
		· .		14	HQ	100					
0, 80 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				15	6 HC	100					
72 mining 72 mining 74 mining 74 mining	22			16	3 SS	100	>				Well screen = 6.10 m x 0.05 m
76 m		End of Borehole						-			
					<u>.</u>				· · ·	<u>    l                                </u>	

Drilled By: Lantech Drilling Ltd.

Drill Method: CME 75 Diamond Bit Coring

Drill Date: June 3, 2008

Checked By: T. Peters

Sheet: 2 of 2

Control of the second secon											·			
EVERCENTITAL LANGEMENT       Will Comment and and the set of t	<u> </u>							Log	of Mo	onitoring Well:	MW08-7			
Image: Specific Nith NTAL MANAGEMENT with the set wit		Gr	eenview	F	Projec	t No.: 1	02.0	8.014						
Client: Township of Greater Madawaska Location: See Site Plan SUBSURFACE STRATA PROFILE SUBSURFACE STRATA PRO	ireenview E	ENVIRONMENTAL MANAGEMENT				Project: Black Donald Waste Disposal Site								
Location: See Site Plan     SugsurFACE STRATA PROFILE     Comments     SugsurFACE STRATA PROFILE     Comments     Open colspan="2">SugsurFACE STRATA PROFILE     SugsurFACE STRATA PROFILE     Comments     Open colspan="2">SugsurFACE STRATA PROFILE     Comments     Open colspan="2">SugsurFACE STRATA PROFILE     Comments     Open colspan="2">SugsurFACE STRATA PROFILE     ConnetStrata     Open colspan="2">SugsurFACE Strata Profile     Open colspan="2">SugsurFACE Strata Profile     ConnetStrata     Import Medium Sand and Gravel     Light modulin gravel, wet, conpacided <td>9 Cleak Aven ancroft, Onta (613) 332-0 (619) 332-1</td> <td>nue, P.O. Box 100 ario K0L 1C0 1057 757</td> <td></td> <td>(</td> <td>Client:</td> <td>Towns</td> <td>ship c</td> <td>of Greate</td> <td>r Madav</td> <td>vaska</td> <td>•</td>	9 Cleak Aven ancroft, Onta (613) 332-0 (619) 332-1	nue, P.O. Box 100 ario K0L 1C0 1057 757		(	Client:	Towns	ship c	of Greate	r Madav	vaska	•			
SUBSURFACE STRATA PROFILE   SAMPLE     Depth   Symbol   Description   No.   Type % R   SPT NValue   Well Completion Datalis   Comments     Image: Strate in the symbol   Description   No.   Type % R   SPT NValue   Well Completion   Control     Image: Strate in the symbol   Description   No.   Type % R   SPT NValue   Well Completion   Control     Image: Strate in the symbol   Description   No.   Type % R   SPT NValue   Control     Image: Strate in the symbol   Description   No.   Type % R   SPT NValue   Control     Image: Strate in the symbol   Description   No.   Type % R   SPT NValue   Control     Image: Strate in the symbol   Description   Image: Strate in the symbol   Image: Strate in the symbol   Control     Image: Strate in the inform strate in the symbol   Image: Strate in the symbol   Image: Strate in the symbol   Strate in the symbol   Strate in the symbol     Image: Strate in the information strate in the symbol   Image: Strate in the symbol   Image: Strate in the symbol   Strate in the symbol     Image: Strate in the information strate in the symbol   Image: Strate in the symbol   Image: Strate in the symbol   Strate in the symbol     Image: Strate in the symbol   Image: Strate in the sy	; solutions@	greenview-enviro	nmental.ca	.	Locati	on: Se	e Site	e Plan						
Subscription   Description   No. Type   % R   SPT N-Value   Well Completion   Comments     film   0   200   400   600   Stick-up = 0.85 m.   Stick-up = 0.85 m.     film   0   0   200   400   600   Stick-up = 0.85 m.     Medium Sand and Gravel   1   AS   1   AS   Concrete     Bown, modum sand with small to medium gravel, wet, compacted.   1   AS   1   AS     and to medium gravel, wet, compacted.   3   55   50   1   Stick up = 0.85 m.     and to medium gravel, wet, compacted.   3   55   50   1   AS     and to medium gravel, wet, compacted.   3   55   50   1   Stick as and     and to medium gravel, wet, compacted.   3   55   50   1   1     and to medium gravel, wet, compacted.   3   55   50   1   1     and to medium gravel, wet, compacted.   3   55   50   1   1     and to medium gravel, wet, compacted.   3   55   50   1   1     and to medium gravel, wet, compacted.   3   55   50   1   1     and to medium cobite at   5   85   50											· · · · · · · · · · · · · · · · · · ·			
Depth   Symbol   Description   No.   Type   % R   SPT N-Value   Well Completion Details   Comments     If Image: Section 2004   Ground Surface   Image: Section 2004   S		SUBS	URFACE STRATA PROFILE			- JAI	VIF <u>-</u> ;							
Depth   Symbol   Description   No.   Type   % R   NValue   Description     If Im   Ground Surface   0   200   400   600   600     If Im   Ground Surface   1   AS   1   AS     Image: Instant and Gravel   Image: Instant and Gravel   1   AS     Image: Instant and Gravel   Image: Instant and Gravel   1   AS     Image: Instant and Gravel   Image: Instant and Gravel   1   AS     Image: Instant and Image: Instant and Gravel   Image: Instant and Gravel   2   SS   10     Image: Instant and Image: Instant and Gravel     Image: Instant and Image: Instant and Gravel     Image: Instant And Image: Instant and Gravel     Image: Instant And Image: Instant and Gravel     Image: Instant And Image: Instant and Gravel   Image: Instant and Gravel   Image: Instant and Gravel   I								CDT		Well Completion	Comments			
film     Ground Surface     Sick-up = 0.85 m       Ground Surface     I AS     I AS       Indian gravel, wel, compacted.     1 AS     I AS       Indian gravel, wel, compacted.     2 SS 10     I AS       Indian gravel, wel, compacted.     2 SS 10     I AS       Indian gravel, wel, compacted.     2 SS 10     I AS       Indian gravel, wel, compacted.     2 SS 10     I AS       Indian gravel, wel, compacted.     3 SS 5     I AS       Indian gravel, wel, compacted.     3 SS 5     I AS       Indian gravel, wel, compacted.     3 SS 5     I AS       Indian gravel, wel, compacted.     3 SS 5     I AS       Indian gravel, wel, compacted.     3 SS 5     I AS       Indian gravel, wel, compacted.     5 SS 50     I AS       Indian gravel, wel, compacted.     5 SS 50     I AS       Indian gravel, wel, compacted.     5 SS 50     I AS       Indian gravel, wel, compacted.     5 SS 50     I AS       Indian gravel, wel, compacted.     5 SS 50     I AS       Indian gravel, wel, compacted.     5 SS 50     I AS       Indian gravel, wel, compacted.     5 SS 50     I AS       <	Depth	Symbol	Description	No.	Туре	% R		N-Valu	e	Dotailo				
Image: State of the state							0 !	200 4	00 600					
Ground Surface     Concrete       Brown, medium sand and Gravel     I     AS       Brown, medium sand and Gravel     I     AS       Digit brown, medium sand and Gravel     I     AS       Digit brown, face to medium sand with small to medium gravel, wet, compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.       Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium cobble at 3.05 m.     Image: Compacted, small to medium compacted, small to medi	ft m										Stick-up = 0.85 m			
And Andrews     And Andrews     Concrete       Medium Sand and Gravel     1     AS       Prine to Medium Sand and Gravel     1     AS       And Andrews     2     SS     10       Simulation Sand and Gravel     1     AS       Concrete     Water level June 5       Simulation Sand     3     SS     5       4     SS     15     4     SS     15       4     SS     15     4     SS     5       4     SS     15     4     SS     5       4     SS     15     4     SS     5       3     SS     5     5     5     5       4     SS     15     5     5     5       4     SS     10     5     5     5     5       5     SS     50     4     5     5     5       6     SS     10     4     5     5     5     5       6     SS     10     4     5     5     5     5       10     <	nhnh.													
Participandia     Concrete       Medium Sand and Gravel Brown, medium sand with small to medium gravel, wet, compacted.     1     AS       Prine to Medium Sand and Gravel Light torwn, fine to medium sand with small to medium gravel, wet, compacted.     1     AS     1       Baseline     3     SS     5     1     Image: Concrete     Water level June 5       Concrete     3     SS     5     1     Image: Concrete     Water level June 5       Baseline     3     SS     5     1     Image: Concrete     Water level June 5       Concrete     3     SS     5     1     Image: Concrete     Bantonite Chips       Bantonite Chips     1     AS     15     Image: Concrete     Bantonite Chips       Bantonite Chips     1     SS     50     Image: Concrete     Silica Sand       Silica Sand     1     1     Silica Sand     Image: Concrete     Silica Sand       Bantonite Chips     1     7     SS     75     Image: Concrete     Silica Sand       Bantonite Chips     1     1     1     1     1     Image: Concrete     Silica Sand       Bantonite Chips														
Bartonite Stand with small to medium gravel, wet, compacted.     1     AS     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10			Ground Surface Medium Sand and Gravel	· .							Concrete			
Image: Second			Brown, medium sand with small to medium gravel, wet, compacted.	1	AS									
1     2     3     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10			Fine to Medium Sand and Gravel		66	10	æ			ž	Water level June 5, $2008 = 0.91 \text{ m}$			
Bentonite Chips Bentonite Chips Here to Medium Sand Light bown, fine to medium sand, wet, compacted, small to medium cobble at 3.05 m. Fine to Medium Sand Light bown, fine to medium cobble at 3.05 m. 5 SS 50 6 SS 10 6 SS 10 7 SS 75 Checked By; J. Balley Checked By; T. Peters Checked By; T. Peters	4	· · · · · ·	small to medium gravel, wet, compacted.								2000 - 0.01			
a     4     SS     15       4     SS     15     4     SS     15       2     1     1     1     1     1     1       2     1     1     1     1     1     1     1       2     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1				3	ss	5					Bentonite Chips			
4     SS     15       5     SS     50       6     SS     10       6     SS     10       6     SS     10       6     SS     10       7     SS     75       8     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10	hulu													
0 - 1 - 3     Fine to Medium Sand, wet, compacted, small to medium cobble at 3.05 m.     5     SS     50     5     SS     50     File to Medium Cobble at 3.05 m.     Silica Sand       2 - 1 - 4     - 5     SS     50     - 6     SS     10     - 6     SS     10     - 7     Silica Sand     Well screen = 3.0       2 - 1 - 5     - 7     SS     75     - 6     SS     10     - 7     SS     75     - 7     Well screen = 3.0       2 - 1 - 7     - 7     - 7     SS     75     - 7     - 7     SS     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7     - 7	8 			4	SS	15	¢							
2-1   3.05 m.   5   SS   50   Sillea Sand     5   SS   50   -   -   -     6   SS   10   -   -   -     6   SS   10   -   -   -     6   SS   10   -   -   -     7   SS   75   -   -   -     21-1   -   -   -   -   -     10   -   -   -   -   -     10   -   -   -   -   -     10   -   -   -   -   -     10   -   -   -   -   -     21   -   -   -   -   -     22   -   -   -   -   -     24   -   -   -   -   -     22   -   -   -   -   -     24   -   -   -   -   -     25   -   -   -   -   -     26   -   -   -   -   -     26   -   -   -   -   - <t< td=""><td>0 - 3</td><td></td><td>Fine to Medium Sand Light brown, fine to medium sand, wet,</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	0 - 3		Fine to Medium Sand Light brown, fine to medium sand, wet,											
44     5     SS     50     50     Silica Sand       6     SS     10     6     SS     10       6     SS     10     1     1     1       22     7     SS     75     1     1     1       24     7     SS     75     1     1     1     1       24     7     SS     75     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td></td> <td></td> <td>compacted, small to medium cobble at 3.05 m.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			compacted, small to medium cobble at 3.05 m.											
4-1     6     SS     10     6     SS     10       6     SS     10     6     SS     10     6     SS     10       10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     1	hihi			5	ss	50	•				Silica Sand			
6     SS     10       6     SS     10       6     SS     10       7     SS     75       7     SS     75       7     SS     75       81     10     10       10     10     10       11     End of Borehole     10       12     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     10       10     10     1	41					·	-							
8     10     6     SS     10     6     SS     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10     10	6 6 7 1 5	5												
6     SS     10     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •	, nh -					·	-							
0     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -	n intro			6	SS	10	•		•					
2     7     SS     75     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •     •	ᅄ													
7     SS     75     Well screen = 3.0       26     End of Borehole     N x 0.05 m       28     Image: Street														
P4   Image: Constraint of Borehole	- <u>+</u> 7	7		7	00	75			****					
26   End of Borehole     28   End of Borehole     Drilled By: Lantech Drilling Ltd.   Logged By: J. Bailey     Drill Method: Hollow Stem Augers   Checked By: T. Peters			·				-				Well screen = 3.05 m x 0.05 m			
Image: Lantech Drilling Ltd.   Logged By: J. Bailey     Drill Method: Hollow Stem Augers   Checked By: T. Peters	1 26			·										
Drilled By: Lantech Drilling Ltd.   Logged By: J. Balley     Drill Method: Hollow Stem Augers   Checked By: T. Peters	huhu		End of Borehole											
Drilled By: Lantech Drilling Ltd.     Logged By: J. Bailey       Drill Method: Hollow Stem Augers     Checked By: T. Peters	287					-	Ľ	I.	!	<u>·  .</u>				
Drill Method: Hollow Stem Augers Checked By: T. Peters	Dri	illed By: La	antech Drilling Ltd.							Logged By	: J. Bailey			
	Dri	ill Method:	Hollow Stem Augers		•	•		-		Checked B	y: T. Peters			

Drill Date: June 5, 2008

Sheet: 1 of 1

Appendix D Photographs

BH1



BH2



MW 08-6





# Black Donald Waste Disposal Site

2024 Groundwater Monitoring Locations



MW-08-5







MW 08-7S (Previously MW 08-7)

DATE	March 2025
PROJECT	22-6213D
FIGURE	1



MW08-7D



BH23-8S



# Black Donald Waste Disposal Site

2024 Groundwater Monitoring Locations



BH23-8D

DATE	March 2025
PROJECT	22-6213D
FIGURE	2



SW4





# Black Donald Waste Disposal Site

2024 Surface Water Monitoring Locations

1	۱.	I	E	
I	v	I	c	3

DATE	March 2025
PROJECT	22-6213D
FIGURE	1

Appendix E Sampling Protocol

### STANDARD SAMPLING PROTOCOL

The following is a description of the monitoring procedures and protocols used for groundwater and surface water monitoring for landfill sites.

#### Equipment Cleaning and Calibration

Regardless of matrix, prior to traveling to the site to be sampled, all equipment such as water level indicators and multi-parameter meters must be cleaned and calibrated as specified by the equipment manufacturer. Details of the cleaning and calibration should be recorded in the field notes.

#### GROUNDWATER Monitoring Well Assessment

Provide an assessment of the status of all monitoring wells at the site.

Note any changes to the well and/or protective casing and record the physical condition of the well; and

Label all observation wells clearly and accurately on both the protective casing and well pipe.

#### Groundwater Monitoring

Maintain and use an accurate, up-to-date list of all observation wells to be monitored.

Check all field equipment for cleanliness; and

Wear personnel protective equipment as required (i.e., gloves, protective glasses, splash guards) during all phases of work, and follow any appropriate health and safety plan procedures.

#### Gas Detection in Wells (Prior to Measuring Water Levels)

Turn on gas meter and prepare for sampling atmospheric condition inside monitoring well.

Remove protective casing cover and well cap avoiding introduction of foreign materials into the well.

Immediately insert the probe attached to the gas meter into the well and wait for readings to stabilize.

Record the measurement in the appropriate column on the field data sheet or field book.

#### Water Level Measurements (Prior to Purging)

Record water level measurements prior to purging or sampling when required.

Do not move dedicated sampling devices such as the "Waterra" inertial pump prior to measuring the water level unless the well diameter dictates removal; reference the measurement from the same location each time (marked location or lowest point on pipe).

Lower the tape/probe into the wells - record the depth to water when the indicator (audible/visual) shows the water level has been reached.

Measure the water level twice by raising and lowering the tape/probe; and

Record the measurement to the nearest cm (0.5 cm) in the appropriate column on the field data sheet or field book.

### Well Purging (Prior to Sampling)

The purpose of purging is to remove the stagnant water from within a monitor (removal of all stagnant water) so that a representative water sample may be collected. The procedures for purging are as follows.

Purge the well only after water levels have been confirmed.

Lift the tubing off the bottom of the well and "pump" at a minimum all stagnant water from the well into a graduated container such as a bucket, pail or cylinder so that the purged volume can be measured and recorded.

For low-yield wells, it is expected that either "no purge sampling techniques or low flow purging will be utilized (avoid purging well dry).

Under normal circumstances purged water may be discarded on the ground, away from the well to avoid the potential of water seeping back into the well; and

Allow a sufficient recovery period before sampling (not more than 48 hours).

#### Field Measurements

Field measurements are to be collected and recorded as outlined in the Environmental Compliance Approval or the approved monitoring program. Typically, these include at a minimum: temperature, pH and conductivity.

#### Well Sampling

Collect the water sample as soon as practical (not more than 48 hours) after purging starting at the least contaminated location and proceeding to the most contaminated.

Lift tubing and check valve off bottom of well to avoid introducing unnecessary sediment into the sample and transfer some representative sample water into a clean, well rinsed container to conduct measurements of field parameters.

Lift the tubing and gently transfer a sample into a clean container and thoroughly mix to form a single representative sample.

Transfer the sample into a pre-labelled sample bottle; labelling to consist of at a minimum, the project number, well ID and the date.

For samples that require filtering, attach the disposable filter onto the end of the tubing (typically a 0.45-micron membrane filter or as otherwise specified should be used).

Attempt to keep sample agitation to a minimum during sample transfer.

Store samples in a cooler, with ice packs to keep cool.

Transport samples to laboratory within the maximum hold time established by the laboratory (typically within a 48-hour period).

#### Volatile Organic Compound (VOC) Sampling

Volatile Organic Compounds (VOC) can be easily lost during sample collection, storage, and transportation. The following sampling and handling protocols are adhered to.

VOC samples are to be collected in special containers provided by the laboratory. These typically include glass vials, preferably amber, with a minimum capacity of 20 ml and sealed with Septum tops.

Vials must be filled just to overflowing in such a manner that no air bubbles pass through the vial as it is being filled (this is easier to accomplish by inserting a 4' length of  $\frac{1}{4}$  " poly tubing into the existing Wattera tubing and filling the vial from the  $\frac{1}{4}$ " tubing).

Vials must then be sealed with the cap so that no air bubbles are entrapped within it; the septum is placed with the Teflon side face down toward the inside of the bottle.

Check for the presence of air bubbles by inverting the vial and tapping on hard surface; if air bubbles are present, discard the sample and re-sample.

All VOC samples must be preserved as specified by the laboratory (typically with 1 to 2 drops of Hydrochloric Acid (HCI)) and refrigerated or stored on ice until analysed; and

VOC samples should be submitted in duplicate at a ratio specified in the approved monitoring program (typically 1:10)

#### Surface Water Sampling (General)

Surface water samples should be collected at the same designated location during each sample event (do not collect samples from any station which is frozen, stagnant or otherwise not representative of normal conditions).

If you must stand in the stream, position yourself downstream of the sample location to avoid contaminating the sample with sediment, debris, and other floating materials.

All equipment must be thoroughly rinsed with distilled water at the beginning of each station to avoid cross-contamination.

Wear gloves as required to handle the sample bottles.

Fill all bottles using an unpreserved transfer bottle (to avoid overflowing pre-preserved bottles).

When sampling for dissolved metals, the sample must be filtered and placed in a separate metals bottle, while sampling for total metals, the sample is placed in a common bottle for metals that is provided by the laboratory.

Label and store all samples in the same manner as for groundwater samples; and

Conduct field measurements (these typically include temperature, pH, conductivity, Dissolved Oxygen and Flow).

#### Flow Measurements (General)

Discharge flow measurements must be taken at designated stations.

#### QA/QC Water Samples

A field quality assurance and quality control program for all monitoring events will be established as follows and or as dictated in the approved monitoring program.

Where groundwater or surface water samples are collected, and if stipulated in the approved monitoring program, a field blank in which a set of sample bottles is filled with distilled water at a known site or monitoring station is submitted to the laboratory for analysis along with the samples

Where VOC samples are taken, a trip blank, in which 1 set of VOC vials are filled with distilled water (at the laboratory or office) prior to going to the field and accompanies the sample bottles until they are returned to the lab; and

Duplicate of as outlined in the approved monitoring program or 1 duplicate for every 10 samples (do not identify the sample ID number to the laboratory, but have it recorded in the field notes) use the sampling technique as for observation wells.

#### SAMPLING

#### Station Sampling Order

The stations will be sampled beginning with those wells exhibiting the lowest chemical concentrations and then moving on to wells with greater chemical concentrations.

### **Monitoring Periods**

The monitoring periods are as recommended in either the approved monitoring program or the Environmental Compliance Approval.

#### Analytical Parameters

Analysis will be as recommended in either the approved monitoring program and or the Environmental Compliance Approval.

#### Gas Detection of On-site Buildings

Gas detection in on-site buildings is to be included as part of regular monitoring.

Appendix F Historic Static Levels, Ground and Surface Water Analysis



#### Groundwater Elevations Black Donald Waste Disposal Site

Monitor	Ground	Top of Pipe	Stick-Up (m)	Depth of	Well	Water Elevation (m)																				
MOTILO	(m) ¹	(m) ¹	(m)	Well (m) ²	(mm)	24-May-16	31-Aug-16	26-Oct-16	08-May-17	18-Sep-17	25-Oct-17	02-May-18	14-Aug-18	30-Oct-18	14-May-19	20-Aug-19	16-Oct-19	23-Apr-20	19-Aug-20	27-Oct-20	18-May-21	19-Aug-21	04-Nov-21	04-May-22	18-Aug-22	27-Oct-22
BH1	93.60	94.18	0.58	8.25	50.8	87.47	87.47	87.36	90.90	88.09	88.37	90.08	88.02	87.81	89.87	88.10	87.12	89.91	89.95	88.99	89.53	88.70	88.72	89.92	89.20	88.72
BH2	98.98	99.79	0.81	7.06	50.8	95.77	95.27	95.02	96.91	95.49	95.88	96.63	95.32	95.23	96.39	94.85	94.49	96.43	93.83	95.82	96.04	95.49	95.88	96.46	96.14	95.58
BH3	99.80	100.67	0.87	8.61	50.8	97.28	96.74	97.26	97.13	96.65	96.83	97.05	96.72	96.62	96.96	96.22	95.67	96.94	97.05	96.93	96.83	96.63	-	-	-	-
BH4	95.96	96.80	0.84	6.97	50.8	93.20	92.47	92.66	94.10	93.01	93.36	93.71	92.61	92.55	93.57	92.54	92.05	93.53	93.32	93.33	93.32	92.93	93.30	93.39	91.82	93.13
MW08-5	105.03	106.06	1.03	12.52	50.5	92.62	92.56	92.55	92.64	92.56	92.56	92.56	92.57	92.56	92.56	92.56	92.56	92.57	92.57	92.57	92.56	92.57	92.55	92.56	92.66	92.55
MW08-6	102.23	103.22	0.99	22.74	50.8	97.71	97.85	97.89	97.94	97.81	97.88	97.90	97.91	97.72	97.90	97.57	97.44	97.90	97.85	97.93	97.85	97.77	97.91	97.87	97.62	97.84
MW08-7	77.785	78.717	0.93	7.70	50.8	77.86	74.73	74.88	78.08	77.40	77.34	77.98	76.33	75.33	78.00	76.47	75.39	77.95	76.27	75.63	77.83	77.03	76.72	77.90	77.44	77.14

Notes: 1. Elevations surveyed by SGS Lakefield Research Ltd. 2. Depth of well below ground surface (m). All elevations are relative to a site specific benchmark elevation of 100.00 m. ** indicates water level is not available.





Parameter	Background	RUC ¹								В	H1							5-year Trends
i urumotor	(median)	KUC	ODW3	24-May-16	26-Oct-16	08-May-17	25-Oct-17	02-May-18	30-Oct-18	14-May-19	16-Oct-19	23-Apr-20	27-Oct-20	18-May-21	04-Nov-21	04-May-22	27-Oct-22	(sparkline)
Alkalinity (as CaCO ₃ )	202	353	30 - 500	780	815	773	790	733	680	703	670	613	724	722	800	602	646	$\sim \sim \sim$
Aluminum	0.03	0.065	0.1	0.060	0.10	0.12	0.11	0.10	0.10	0.10	0.12	0.09	0.06	0.07	0.09	0.06	0.07	-~~~
Ammonia, Total (as N)	0.02	N/L	N/L	7.27	8.79	6.23	7.20	6.48	5.94	5.85	2.66	5.03	1.39	6.03	5.54	5.27	1.91	$\sim$
Ammonia, Un-ionized ³	0.00022	N/L	N/L	0.01559	0.01119	0.00611	0.00915	0.00150	0.00686	0.01208	0.00579	0.01407	0.00646	0.01656	0.01735	0.00646	0.00464	$\sim$
Barium	0.019	0.3	1	0.142	0.170	0.213	0.196	0.152	0.144	0.121	0.131	0.111	0.088	0.121	0.122	0.116	0.076	$\sim$
Boron	0.01	1.3	5	1.19	1.37	1.33	1.53	1.62	1.48	1.66	1.53	1.20	0.911	1.68	1.14	1.29	0.610	$\sim$
Cadmium	0.000015	0.0013	0.005	< 0.00002	< 0.00002	< 0.000014	< 0.000014	< 0.000015	< 0.000015	< 0.000015	0.000017	< 0.000015	< 0.000028	< 0.000028	< 0.000028	< 0.000015	0.000015	$\wedge$ /
Calcium	79	N/L	N/L	186	215	288	252	225	200	203	220	196	173	214	187	175	133	$\sim\sim$
Chloride	0.8	125	250	69.0	13.3	56.4	55.0	59.2	46.4	49.7	50.5	33.5	37.5	43.4	37.7	33.8	20.6	$\sim$
Chromium	0.001	0.013	0.05	< 0.002	0.002	0.001	< 0.001	< 0.002	< 0.001	< 0.001	0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	Ň
Cobalt	0.0004	N/L	N/L	0.0072	0.0053	0.0077	0.0050	0.0044	0.0097	0.0039	0.0072	0.0060	0.0026	0.0066	0.0054	0.0071	0.0019	$\overline{\sim}$
Chemical Oxygen Demand	5	N/L	N/L	62	61	62	69	66	48	58	40	45	29	63	33	32	15	$\sim\sim\sim$
Conductivity (µS/cm) 4	284	N/L	N/L	160	1170	1106	1150	1060	1041	1001	909	913	1086	1102	1044	741	924	$\sim$
Copper	0.002	0.5	1	< 0.002	< 0.002	< 0.002	0.003	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.0015	< 0.002	0.0026	0.0015	$\setminus$ $\bigwedge$
Dissolved Organic Carbon	2.1	3.6	5	16.0	17.9	17.6	21.1	18.7	17.4	22.1	17.1	16.2	9.7	18.4	18.4	14.4	7.7	~~~
Hardness (as CaCO ₃ )	209	357	500	592	684	886	784	705	621	644	687	614	544	672	596	550	445	$\sim$
Iron	0.007	0.2	0.3	7.40	14.60	23.60	17.70	6.31	6.70	0.898	3.19	5.03	0.668	0.014	4.87	5.24	1.04	MÁ
Magnesium	2.8	N/L	N/L	30.9	35.8	40.4	37.4	34.7	29.5	33.1	33.3	30.2	27.2	33.5	31.2	27.6	27.4	$\sim$
Manganese	0.001	0.03	0.05	1.80	1.97	3.68	2.10	1.15	1.25	1.06	1.10	1.07	0.190	1.27	0.917	1.17	0.315	$\sim \sim$
Nitrate (as N)	0.10	2.6	10	0.2	44.2	0.10	0.32	0.73	0.05	1.06	0.60	0.89	0.48	1.88	0.31	0.27	0.63	in
pH (units) 4	7.65	6.5 - 8.5	6.5 - 8.5	7.11	6.84	6.81	6.83	6.14	6.81	7.15	7.08	6.94	7.44	7.19	7.25	6.86	7.13	$\sim$
Phenols	0.002	N/L	N/L	< 0.001	< 0.001	0.018	< 0.001	0.001	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	$\overline{\wedge}$
Phosphorus, Total	0.03	N/L	N/L	0.04	0.04	0.05	0.02	0.06	0.02	0.05	0.02	0.02	0.03	0.03	0.03	< 0.01	0.02	$\overline{}$
Potassium	2.4	N/L	N/L	15.0	17.8	18.6	17.4	16.9	15.4	15.3	15.2	13.7	10.4	14.1	12.5	11.9	7.8	$\sim$
Silicon	4.38	N/L	N/L	9.24	11.10	12.30	11.80	9.69	8.63	9.10	8.78	9.90	9.02	9.80	10.9	10.4	7.44	$\sim\sim\sim$
Sodium	3	101.3	200	75.2	82.4	76.3	76.3	86.8	71.3	71.3	60.2	70.0	141	96.8	138	86.3	120	$\sim$
Strontium	0.26	N/L	N/L	0.509	0.625	0.680	0.665	0.618	0.521	0.595	0.592	0.500	0.467	0.585	0.554	0.473	0.417	$\sim \sim$
Sulphate	12	256	500	31	93	24	29	40	36	42	36	42	68	62	55	49	38	$\sim$
Total Dissolved Solids	231	366	500	895	946	875	909	818	806	823	773	703	872	848	857	707	715	~~~
Total Kjeldahl Nitrogen	0.2	N/L	N/L	10.4	13.6	8.8	8.9	8.2	7.7	7.3	3.4	5.8	1.9	6.0	5.9	5.9	2.3	
Zinc	0.005	2.5	5	< 0.005	< 0.005	< 0.005	0.007	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006	0.005	$\wedge$
Notes: 1. Resonable Use Concept (RUC 2. Ontario Drinking Water Standarr 3. Results obtained from laboratory 4. Results obtained from lide analy All results are expressed in mg/L ur Bold and shader values exceed the Bold and Italic values exceed the Bold and Italic values exceed RUC I NL indicates No Limit. *** indicates results obtained from la ** indicates parameter not analyzed	c) criteria. (c) (CDWS). v analysis. rsis. (ess otherwise stated. (CDWS, imits. ab analysis j.																	





Parameter	Background (median)	RUC ¹		BH2 (Background) 5-														5-year Trends
	(median)			24-May-16	26-Oct-16	08-May-17	25-Oct-17	02-May-18	30-Oct-18	14-May-19	16-Oct-19	23-Apr-20	27-Oct-20	18-May-21	04-Nov-21	04-May-22	27-Oct-22	(sparkline)
Alkalinity (as CaCO ₃ )	202	353	30 - 500	232	225	240	218	210	207	220	207	208	201	221	240	238	224	$\sim$
Aluminum	0.03	0.065	0.1	0.02	0.28	0.07	0.05	0.05	0.03	0.05	0.06	0.05	0.02	0.03	0.06	0.03	0.05	$\sim \sim \sim$
Ammonia, Total (as N)	0.02	N/L	N/L	< 0.01	< 0.01	< 0.01	< 0.01	0.03	0.03	0.04	0.02	0.03	0.01	0.01	0.02	0.01	< 0.01	
Ammonia, Un-ionized ³	0.00022	N/L	N/L	0.00000	0.00006	0.00007	0.00008	0.00002	0.00021	0.00035	0.00035	0.00032	0.00029	0.00006	0.00010	0.00007	0.00005	$\frown$
Barium	0.019	0.3	1	0.014	0.019	0.034	0.020	0.017	0.018	0.020	0.017	0.018	0.019	0.019	0.021	0.020	0.020	$\sim$
Boron	0.01	1.3	5	< 0.005	0.007	< 0.005	0.019	0.009	0.005	0.055	0.010	0.010	< 0.005	0.010	0.010	0.012	0.005	
Cadmium	0.000015	0.0013	0.005	< 0.00002	< 0.00002	< 0.000014	< 0.000014	< 0.000015	< 0.000015	0.000016	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	0.000016	0.000014	$\Lambda$
Calcium	79	N/L	N/L	77.8	88.6	111	92.1	88.0	79.0	90.3	89.7	91.1	89.7	97.8	98.3	97.4	89.5	$\sqrt{-}$
Chloride	0.8	125	250	< 0.5	86.8	< 0.5	0.8	< 0.5	0.7	0.8	1.1	1.1	1.1	0.9	0.7	< 0.5	0.7	$\sim$
Chromium	0.001	0.013	0.05	< 0.002	< 0.002	0.0009	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	
Cobalt	0.0004	N/L	N/L	0.0002	0.0006	< 0.0001	< 0.0001	< 0.0001	0.0002	0.0002	0.0004	0.0003	0.0002	0.0002	0.0003	0.0002	0.0001	$\sim \sim \sim$
Chemical Oxygen Demand	5	N/L	N/L	< 5	< 5	< 5	< 5	5	< 5	< 5	< 5	6	< 5	< 5	< 5	< 5	< 5	$\land \land$
Conductivity (µS/cm) 4	284	N/L	N/L	320	319	298	322	156	286	275	277	248	306	299	401	260	324	~~~~
Copper	0.002	0.5	1	0.003	< 0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.0012	0.002	0.0018	0.0009	$\land$
Dissolved Organic Carbon	2.1	3.6	5	1.3	1.3	1.5	2.7	1.5	2.3	3.2	2.1	2.6	2.0	2.1	5.7	2.2	0.8	
Hardness (as CaCO ₃ )	209	357	500	205	235	293	243	232	207	242	236	241	236	257	259	258	234	
Iron	0.007	0.2	0.3	< 0.005	0.016	< 0.005	0.007	0.009	0.058	0.035	< 0.005	0.007	< 0.005	< 0.005	0.021	< 0.005	0.005	$\Lambda$
Magnesium	2.8	N/L	N/L	2.55	3.27	3.85	3.07	2.81	2.40	3.97	2.75	3.25	2.84	3.05	3.11	3.51	2.59	M
Manganese	0.001	0.03	0.05	< 0.001	0.003	0.001	< 0.001	< 0.001	0.001	0.030	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	$\Lambda$
Nitrate (as N)	0.10	2.6	10	< 0.1	0.1	< 0.05	0.12	< 0.05	< 0.05	0.18	0.14	0.12	0.06	0.11	< 0.05	0.09	0.16	$\sum $
pH (units) ⁴	7.65	6.5 - 8.5	6.5 - 8.5	6.06	7.60	7.69	7.65	6.70	7.62	7.81	7.97	7.89	8.28	7.56	7.46	7.64	7.51	
Phenols	0.002	N/L	N/L	< 0.001	< 0.001	0.005	< 0.001	< 0.001	0.006	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	$\wedge$
Phosphorus, Total	0.03	N/L	N/L	0.02	0.02	0.02	0.04	0.03	0.01	0.03	0.01	0.02	0.02	0.02	0.01	0.02	0.03	
Potassium	2.4	N/L	N/L	2.2	3.0	3.3	3.3	2.8	2.6	3.1	3.0	3.2	3.1	2.9	3.1	3.1	2.7	
Silicon	4.38	N/L	N/L	5.15	6.26	7.17	7.07	5.89	5.41	5.81	5.74	6.76	6.27	6.49	6.71	7.02	4.23	~~~~
Sodium	3	101.3	200	2.7	3.7	3.3	3.1	2.8	2.5	4.6	2.7	3.0	2.8	2.6	3.2	3.3	2.2	
Strontium	0.26	N/L	N/L	0.145	0.184	0.218	0.189	0.170	0.148	0.191	0.178	0.197	0.173	0.190	0.195	0.205	0.160	
Sulphate	12	256	500	12	31	11	11	12	17	12	17	13	17	13	16	15	10	$\sim\sim\sim$
Total Dissolved Solids	231	366	500	237	256	261	245	221	230	231	229	225	234	233	242	251	235	$\sim$
Total Kjeldahl Nitrogen	0.2	N/L	N/L	< 0.1	0.3	0.1	0.2	0.2	0.2	< 0.1	0.1	< 0.1	0.1	0.1	0.1	0.2	< 0.1	$\sim \sim$
Zinc	0.005	2.5	5	0.009	< 0.005	0.006	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006	$\land$ /
Notes: 1. Reasonable Use Concept (RUC 2. Ontario Drinking Water Standar 3. Results obtained from faid anal All results abtained from field anal All results are expressed in mg/L Bold and shaded values exceed the Bold and halic values exceed RUC N/L indicates No Limit. *** indicates results obtained from 1 ** indicates parameter not analyze	C) criteria. ds (ODWS). y analysis. ysis. noless otherwise stated. a ODWS. limits. lab analysis d.																	





Parameter	Background	BUC 1							BH3						5-year Trends
Falanielei	(median)	RUC	ODWS	24-May-16	26-Oct-16	08-May-17	25-Oct-17	02-May-18	30-Oct-18	14-May-19	16-Oct-19	23-Apr-20	27-Oct-20	18-May-21	(sparkline)
Alkalinity (as CaCO ₃ )	202	353	30 - 500	379	405	179	452	194	413	234	326	171	407	303	$\wedge \wedge \wedge$
Aluminum	0.03	0.065	0.1	0.04	0.05	0.04	0.09	0.05	0.10	0.05	0.11	0.05	0.06	0.04	$\sim$
Ammonia, Total (as N)	0.02	N/L	N/L	< 0.01	0.01	< 0.01	0.04	0.01	0.02	0.02	0.02	0.02	< 0.01	0.01	$\wedge \neg$
Ammonia, Un-ionized ³	0.00022	N/L	N/L	0.000002	0.000013	0.000042	0.000075	0.000010	0.000026	0.000130	0.000136	0.000058	0.000055	0.000037	$\sim$
Barium	0.019	0.3	1	0.077	0.107	0.035	0.116	0.029	0.091	0.037	0.092	0.033	0.135	0.083	$\wedge \wedge \wedge$
Boron	0.01	1.3	5	0.291	0.444	0.049	0.705	0.052	0.428	0.093	0.721	0.059	0.376	0.208	$\wedge \wedge \wedge$
Cadmium	0.000015	0.0013	0.005	0.00005	< 0.00002	< 0.000014	0.000030	0.000085	0.000043	< 0.000015	0.000029	< 0.000015	< 0.000028	< 0.000015	$\wedge$
Calcium	79	N/L	N/L	152	201	82.0	219	75.6	188	93.0	195	73.2	200	143	$\wedge \wedge \wedge$
Chloride	0.8	125	250	8.5	< 0.5	0.6	6.1	0.9	4.6	1.5	6.4	1.0	4.5	1.9	$\wedge \wedge \wedge$
Chromium	0.001	0.013	0.05	< 0.002	< 0.002	0.0005	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	\
Cobalt	0.0004	N/L	N/L	0.0005	0.0019	0.0002	0.0006	< 0.0001	0.0007	0.0002	0.0008	0.0002	< 0.0002	0.0002	$\sim$
Chemical Oxygen Demand	5	N/L	N/L	13	8	7	20	12	12	10	7	12	12	8	$\bigwedge$
Conductivity (µS/cm) 4	284	N/L	N/L	691	773	325	730	298	717	426	668	283	649	528	$\wedge \wedge \wedge$
Copper	0.002	0.5	1	0.003	< 0.002	0.004	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.002	< 0.002	0.0021	$\backslash$
Dissolved Organic Carbon	2.1	3.6	5	5.7	7.2	4.5	10.9	3.8	8.5	6.2	8.3	4.5	6.2	5.6	M
Hardness (as CaCO ₃ )	209	357	500	436	576	230	624	212	538	265	559	207	571	409	$\dot{\wedge}$
Iron	0.007	0.2	0.3	< 0.005	0.027	< 0.005	0.011	< 0.005	0.015	0.005	0.008	< 0.005	< 0.005	< 0.005	$\mathcal{N}$
Magnesium	2.8	N/L	N/L	13.9	18.0	6.15	18.6	5.70	16.5	7.87	17.5	5.90	17.2	12.6	$\overline{\mathbb{A}}$
Manganese	0.001	0.03	0.05	0.007	0.067	0.006	0.048	0.003	0.024	0.001	0.023	0.005	0.036	0.002	$\wedge$
Nitrate (as N)	0.10	2.6	10	0.4	0.1	0.10	0.55	0.07	0.82	0.28	0.11	0.09	0.83	0.75	$\sim$
pH (units) 4	7.65	6.5 - 8.5	6.5 - 8.5	6.01	6.89	7.45	7.00	6.78	6.86	7.64	7.59	7.25	7.50	7.34	$\checkmark$
Phenols	0.002	N/L	N/L	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	
Phosphorus, Total	0.03	N/L	N/L	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.02	
Potassium	2.4	N/L	N/L	1.8	2.3	0.9	3.3	0.8	2.3	1.0	2.1	0.9	2.0	1.8	$\wedge \sim$
Silicon	4.38	N/L	N/L	3.01	3.32	2.41	4.38	2.30	3.43	2.36	3.23	2.52	3.80	3.40	$\wedge \sim$
Sodium	3	101.3	200	11.6	15.2	2.8	15.7	2.3	9.5	2.7	11.7	2.1	6.4	4.0	$\wedge \wedge \wedge$
Strontium	0.26	N/L	N/L	0.310	0.433	0.153	0.469	0.149	0.387	0.192	0.420	0.154	0.446	0.324	$\wedge \wedge \wedge$
Sulphate	12	256	500	114	18	14	132	16	181	40	209	16	128	49	$\sim$
Total Dissolved Solids	231	366	500	531	607	210	608	212	590	272	526	192	547	346	$\wedge \wedge \wedge$
Total Kjeldahl Nitrogen	0.2	N/L	N/L	0.3	0.5	1.7	0.4	0.2	0.3	0.1	0.3	0.1	0.3	0.2	$\sum$
Zinc	0.005	2.5	5	0.033	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	
Notes: 1. Reasonable Use Concept (RUC 2. Ontario Drinking Water Standard 3. Results obtained from laboratory 4. Results obtained from laboratory All results are expressed in mg/L un Bold and shader values exceed the Bold and Italic values exceed RUC I N/L indicates No Limit. *** indicates results obtained from la ** indicates parameter not analyzed	) criteria. (s (ODWS). analysis. sis. less otherwise stated. ODWS. imits. ab analysis														





Parameter	Background (median)	RUC ¹								в	H4							5-year Trends
	(median)	NOO		24-May-16	26-Oct-16	08-May-17	25-Oct-17	02-May-18	30-Oct-18	14-May-19	16-Oct-19	23-Apr-20	27-Oct-20	18-May-21	04-Nov-21	04-May-22	27-Oct-22	(sparkline)
Alkalinity (as CaCO ₃ )	202	353	30 - 500	548	459	550	416	360	409	599	505	618	505	320	406	469	251	$\sim\sim$
Aluminum	0.03	0.065	0.1	0.05	0.04	0.11	0.09	0.08	0.09	0.11	0.13	0.12	0.08	0.05	0.09	0.08	0.14	$\sim$
Ammonia, Total (as N)	0.02	N/L	N/L	0.03	< 0.01	0.49	0.05	0.02	0.06	1.00	0.57	0.63	0.20	0.01	0.03	0.11	0.12	M-
Ammonia, Un-ionized ³	0.00022	N/L	N/L	0.00004	0.00001	0.00091	0.00007	0.00013	0.00008	0.00347	0.00202	0.00170	0.00023	0.00002	0.00008	0.00019	0.00020	$\wedge$
Barium	0.019	0.3	1	0.078	0.068	0.127	0.095	0.059	0.059	0.099	0.090	0.120	0.110	0.062	0.067	0.091	0.117	$\sim$
Boron	0.01	1.3	5	0.731	0.280	1.42	0.460	0.480	0.327	2.21	1.57	2.96	2.22	0.384	0.245	1.25	0.373	
Cadmium	0.000015	0.0013	0.005	< 0.00002	< 0.00002	0.000020	< 0.000014	< 0.000015	< 0.000015	< 0.000029	0.000092	< 0.000015	0.000065	< 0.000015	< 0.000015	< 0.000015	0.000025	
Calcium	79	N/L	N/L	191	149	252	184	170	163	229	234	291	266	185	181	264	358	$\sim$
Chloride	0.8	125	250	18.6	11.8	25.7	3.8	16.4	6.9	44.9	25.4	82.5	36.5	4.3	1.7	41.4	10.5	$\sim$
Chromium	0.001	0.013	0.05	< 0.002	< 0.002	0.0005	< 0.001	< 0.002	< 0.001	< 0.001	0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	$\wedge$
Cobalt	0.0004	N/L	N/L	0.0007	0.0008	0.0006	< 0.0001	< 0.0001	0.0002	0.0011	0.0013	0.0016	0.0012	0.0002	0.0001	0.0009	0.0059	
Chemical Oxygen Demand	5	N/L	N/L	23	< 5	30	18	21	< 5	65	29	87	38	7	< 5	27	45	$\overline{\mathcal{N}}$
Conductivity (µS/cm) 4	284	N/L	N/L	851	744	966	737	623	780	887	950	971	1534	681	786	820	1218	
Copper	0.002	0.5	1	0.0050	< 0.002	0.0030	0.0040	0.0020	< 0.002	0.0040	0.0050	0.0070	0.0050	0.0024	0.002	0.0051	0.0037	$\sim$
Dissolved Organic Carbon	2.1	3.6	5	9.2	3.4	11.8	7.9	6.5	7.2	24.9	15.9	22.0	15.9	6.2	7.8	13.8	12.5	· M
Hardness (as CaCO ₃ )	209	357	500	552	432	729	541	493	461	673	674	860	775	529	509	766	1010	$\sim$
Iron	0.007	0.2	0.3	< 0.005	< 0.005	< 0.005	0.010	< 0.005	0.007	0.005	0.005	0.005	< 0.005	< 0.005	0.011	< 0.005	0.009	$\sim N$
Magnesium	2.8	N/L	N/L	18.1	14.8	24.2	19.6	16.5	13.0	24.4	21.6	32.2	27.0	16.1	13.8	25.7	27.2	$\sim$
Manganese	0.001	0.03	0.05	0.006	0.019	0.108	0.195	0.002	0.066	0.015	1.60	0.004	0.852	0.012	0.036	0.010	7.98	/
Nitrate (as N)	0.10	2.6	10	1.9	1.8	0.73	0.23	2.37	0.39	0.42	0.14	1.15	0.18	0.51	< 0.05	0.19	0.08	La
pH (units) 4	7.65	6.5 - 8.5	6.5 - 8.5	6.94	6.91	7.09	6.87	7.67	6.88	7.35	7.31	7.26	6.83	7.01	7.17	7.02	6.98	$\sim$
Phenols	0.002	N/L	N/L	< 0.001	< 0.001	0.005	< 0.001	< 0.001	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	$\wedge$
Phosphorus, Total	0.03	N/L	N/L	0.02	0.02	0.03	0.02	0.03	0.03	0.03	0.02	0.03	0.02	0.04	0.01	0.02	0.02	$\neg \checkmark \checkmark$
Potassium	2.4	N/L	N/L	8.3	9.6	13.7	13.2	8.9	7.0	13.3	12.4	17.8	15.4	7.8	7.9	11.5	11.4	$\sim\sim\sim$
Silicon	4.38	N/L	N/L	5.31	6.26	6.72	7.59	4.68	5.11	6.30	6.03	7.86	7.24	5.60	6.14	6.86	5.05	$\sim\sim$
Sodium	3	101.3	200	25.7	18.1	39.8	23.5	17.5	10.6	40.6	33.9	65.9	55.7	10.9	7.3	30.7	21.9	$\sim\sim\sim$
Strontium	0.26	N/L	N/L	0.420	0.362	0.525	0.488	0.414	0.385	0.578	0.659	0.794	0.748	0.469	0.449	0.648	0.821	$\sim$
Sulphate	12	256	500	147	206	122	113	192	101	151	145	233	156	174	95	< 1	455	$\sim\sim$
Total Dissolved Solids	231	366	500	746	530	736	551	568	518	806	665	927	727	488	470	764	956	$\sim$
Total Kjeldahl Nitrogen	0.2	N/L	N/L	0.6	0.4	1.1	0.4	0.4	0.3	2.0	1.2	2.0	1.1	0.2	0.2	0.7	1.0	$\sim$
Zinc	0.005	2.5	5	0.024	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006	/
Notes: 1. Reasonable Use Concept (RUC 2. Ontario Drinking Water Standar 3. Results obtained from laboratory 4. Results obtained from lide analy All results are expressed in mg/L un Bold and shaded values exceed the Bold and Italic values exceed RUC N/L indicates No Limit. *** indicates results obtained from li ** indicates parameter not analyzed	C) criteria. dds (ODWS). y analysis. ysis. noless otherwise stated. a ODWS. limits. lab analysis d.																	





Parameter	Background	PLIC ¹								MW08-6 (Ba	ackground)							5-year Trends
i diameter	(median)	RUC	00003	24-May-16	26-Oct-16	08-May-17	25-Oct-17	02-May-18	30-Oct-18	14-May-19	16-Oct-19	23-Apr-20	27-Oct-20	18-May-21	04-Nov-21	04-May-22	27-Oct-22	(sparkline)
Alkalinity (as CaCO ₃ )	202	353	30 - 500	194	173	183	172	180	168	171	162	153	145	160	183	169	161	$\sim \sim$
Aluminum	0.03	0.065	0.1	0.03	0.02	0.05	0.05	0.05	0.03	0.04	0.05	0.04	< 0.01	0.02	0.04	0.02	0.03	$\sim$
Ammonia, Total (as N)	0.02	N/L	N/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.03	0.02	0.02	< 0.01	< 0.01	0.04	< 0.01	< 0.01	$ \frown  $
Ammonia, Un-ionized ³	0.00022	N/L	N/L	0.00003	0.00007	0.00013	0.00016	0.00025	0.00012	0.00086	0.00023	0.00021	0.00006	0.00010	0.00049	0.00011	0.00013	
Barium	0.019	0.3	1	0.016	0.017	0.020	0.018	0.019	0.017	0.019	0.019	0.019	0.020	0.020	0.021	0.023	0.026	
Boron	0.01	1.3	5	0.008	0.005	0.005	0.014	0.008	< 0.005	0.012	0.011	0.008	< 0.005	0.008	0.008	0.007	0.008	
Cadmium	0.000015	0.0013	0.005	0.00003	< 0.00002	< 0.000014	< 0.000014	< 0.000015	< 0.000015	< 0.000029	0.000017	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	0.000013	
Calcium	79	N/L	N/L	63.8	69.2	82.5	71.1	72.1	61.5	70.9	66.8	65.1	64.5	69.4	71.5	68.5	63.7	
Chloride	0.8	125	250	< 0.5	2.3	< 0.5	0.8	< 0.5	0.7	1.0	1.0	0.9	0.8	0.6	< 0.5	< 0.5	0.5	$\frown$
Chromium	0.001	0.013	0.05	< 0.002	< 0.002	0.0006	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	
Cobalt	0.0004	N/L	N/L	0.0020	0.0007	0.0003	0.0003	0.0004	0.0005	0.0004	0.0005	0.0005	0.0005	0.0004	0.0005	0.0005	0.0007	~~/
Chemical Oxygen Demand	5	N/L	N/L	< 5	< 5	< 5	20	7	< 5	5	< 5	6	< 5	< 5	< 5	5	< 5	
Conductivity (µS/cm) 4	284	N/L	N/L	261	240	129	238	245	286	237	391	192	294	232	257	199	240	$\sim$
Copper	0.002	0.5	1	0.003	< 0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.0019	0.003	0.0022	0.0018	$\square$
Dissolved Organic Carbon	2.1	3.6	5	2.0	2.1	2.1	3.3	2.0	2.8	3.9	2.7	3.4	5.5	2.5	9.4	3.1	2.5	
Hardness (as CaCO ₃ )	209	357	500	170	184	219	189	192	164	189	178	174	172	186	191	183	170	$\sim$
Iron	0.007	0.2	0.3	0.063	< 0.005	< 0.005	0.016	< 0.005	0.005	< 0.005	< 0.005	0.006	0.018	< 0.005	0.009	< 0.005	0.014	$\sim \mathcal{M}$
Magnesium	2.8	N/L	N/L	2.58	2.76	3.03	2.76	2.88	2.47	2.90	2.73	2.80	2.62	3.09	2.96	2.91	2.63	$\sim$
Manganese	0.001	0.03	0.05	0.031	0.002	0.001	0.001	< 0.001	0.001	< 0.001	0.001	0.002	0.002	< 0.001	0.001	< 0.001	0.002	$\sim \sim$
Nitrate (as N)	0.10	2.6	10	0.4	0.2	0.19	0.07	< 0.05	0.19	0.38	0.30	0.16	0.09	0.14	0.19	0.11	0.13	$\wedge$
pH (units) 4	7.65	6.5 - 8.5	6.5 - 8.5	7.27	7.64	7.94	7.98	8.19	7.87	8.28	7.80	7.82	7.59	7.75	7.89	7.79	7.90	$\sim$
Phenols	0.002	N/L	N/L	< 0.001	< 0.001	0.003	< 0.001	< 0.001	0.003	< 0.002	< 0.002	0.003	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	$\Lambda\Lambda$
Phosphorus, Total	0.03	N/L	N/L	0.03	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.02	0.03	0.01	0.01	< 0.01	$\sim$
Potassium	2.4	N/L	N/L	1.9	1.8	2.2	2.0	1.9	1.5	1.7	2.0	1.8	2.0	1.8	1.7	1.7	2.0	$\bigvee$
Silicon	4.38	N/L	N/L	3.35	3.60	4.15	3.86	3.29	3.12	3.38	3.13	3.46	3.32	3.44	3.40	3.52	2.41	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Sodium	3	101.3	200	3.0	2.8	2.8	2.5	2.4	2.0	1.9	2.1	2.0	2.0	2.1	1.9	2.1	2.1	$\bigvee$
Strontium	0.26	N/L	N/L	0.326	0.355	0.411	0.357	0.362	0.302	0.330	0.332	0.319	0.313	0.372	0.306	0.345	0.299	$\searrow \land$
Sulphate	12	256	500	11	36	10	7	10	9	9	8	7	8	7	8	8	9	$\searrow$
Total Dissolved Solids	231	366	500	201	196	205	191	191	186	184	170	164	170	168	183	177	171	$\searrow$
Total Kjeldahl Nitrogen	0.2	N/L	N/L	0.1	0.2	0.2	0.2	0.2	0.2	< 0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	$\overline{}$
Zinc	0.005	2.5	5	0.009	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	/
Notes: 1. Reasonable Use Concept (RU 2. Ontario Drinking Water Standar 3. Results obtained from laboration 4. Results obtained from field anal All results are expressed in mg/L Bold and shaded values exceed the Bold and thatic values exceed RUC N/L indicates No Limit. *** indicates results obtained from 1 ** indicates parameter not analyze	C) criteria. ds (ODWS). y analysis. ysis. nelses otherwise stated. s ODWS. imits. ab analysis d.																	





Parameter	Background	PLIC ¹								MW	108-7							5-year Trends
	(median)	Noo	00110	24-May-16	26-Oct-16	08-May-17	25-Oct-17	02-May-18	30-Oct-18	14-May-19	16-Oct-19	23-Apr-20	27-Oct-20	18-May-21	04-Nov-21	04-May-22	27-Oct-22	(sparkline)
Alkalinity (as CaCO ₃ )	202	353	30 - 500	188	182	180	210	189	176	182	176	178	170	185	237	207	220	$\sim$
Aluminum	0.03	0.065	0.1	0.02	0.03	0.05	0.05	0.04	0.04	0.14	0.05	0.05	0.01	0.02	0.05	0.02	0.03	
Ammonia, Total (as N)	0.02	N/L	N/L	< 0.01	< 0.01	< 0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	< 0.01	0.02	< 0.01	< 0.01	$\frown$
Ammonia, Un-ionized ³	0.00022	N/L	N/L	0.00001	0.00012	0.00005	0.00023	0.00001	0.00024	0.00019	0.00041	0.00003	0.00051	0.00007	0.00024	80000.0	0.00010	$\sim \sim \sim$
Barium	0.019	0.3	1	0.033	0.036	0.049	0.048	0.040	0.036	0.045	0.041	0.047	0.040	0.042	0.048	0.047	0.056	~~
Boron	0.01	1.3	5	< 0.005	< 0.005	< 0.005	0.011	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005	$\square$
Cadmium	0.000015	0.0013	0.005	< 0.00002	< 0.00002	< 0.000014	< 0.000014	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000010	
Calcium	79	N/L	N/L	57.7	61.4	82.7	71.9	72.2	56.9	79.9	67.6	74.5	64.6	73.3	78.5	81.1	76.5	$\sim$
Chloride	0.8	125	250	39.1	< 0.5	47.0	31.7	39.7	33.4	57.6	49.9	46.7	32.6	31.4	36.2	51.9	47.3	$\sim$
Chromium	0.001	0.013	0.05	< 0.002	< 0.002	0.0004	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	
Cobalt	0.0004	N/L	N/L	< 0.0001	0.0003	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0006	0.0002	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	$\wedge$
Chemical Oxygen Demand	5	N/L	N/L	50	25	< 5	12	21	< 5	10	15	26	11	< 5	< 5	< 5	9	$\overline{\mathbf{V}}$
Conductivity (µS/cm) 4	284	N/L	N/L	306	301	321	378	282	291	308	323	269	303	284	402	296	396	$\sim \mathbb{N}$
Copper	0.002	0.5	1	< 0.002	< 0.002	0.003	0.002	0.002	< 0.002	< 0.002	< 0.002	0.003	< 0.002	0.0014	0.002	0.0027	0.0021	$\overline{\mathbf{A}}$
Dissolved Organic Carbon	2.1	3.6	5	2.3	2.2	2.5	3.5	2.3	2.6	3.8	2.7	3.2	3.2	2.9	5.2	2.6	1.5	
Hardness (as CaCO ₃ )	209	357	500	175	186	246	214	215	169	243	202	223	192	220	233	241	225	$\sim$
Iron	0.007	0.2	0.3	< 0.005	0.026	< 0.005	< 0.005	< 0.005	0.009	0.350	< 0.005	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005	$\overline{\wedge}$
Magnesium	2.8	N/L	N/L	7.43	7.79	9.67	8.25	8.40	6.58	10.6	7.94	9.02	7.37	8.92	8.90	9.26	8.14	$\overline{}$
Manganese	0.001	0.03	0.05	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.001	0.023	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	$\wedge$
Nitrate (as N)	0.10	2.6	10	0.1	0.2	0.09	< 0.05	0.06	< 0.05	0.21	0.09	0.13	< 0.05	0.17	0.07	0.16	0.11	
pH (units) ⁴	7.65	6.5 - 8.5	6.5 - 8.5	6.90	7.97	7.67	8.07	6.85	7.94	7.97	8.13	7.16	8.30	7.80	7.87	7.82	7.81	
Phenols	0.002	N/L	N/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.003	< 0.002	< 0.002	0.003	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	$\Lambda\Lambda$
Phosphorus, Total	0.03	N/L	N/L	2.73	0.80	0.15	0.12	1.23	0.21	0.37	0.62	1.20	1.12	0.12	0.10	0.12	0.07	VL
Potassium	2.4	N/L	N/L	1.1	1.2	1.5	1.9	1.3	1.3	1.3	1.5	1.5	1.6	1.5	1.7	1.6	1.7	_~~~
Silicon	4.38	N/L	N/L	3.08	3.74	4.13	5.08	3.58	3.41	3.38	3.47	3.80	3.73	3.78	4.45	3.93	2.94	$\sim \sim$
Sodium	3	101.3	200	23.2	29.7	28.2	36.1	22.0	23.9	20.1	28.5	26.5	26.0	22.5	32.7	25.1	30.4	$\sim$
Strontium	0.26	N/L	N/L	0.103	0.117	0.142	0.135	0.123	0.103	0.142	0.128	0.137	0.112	0.132	0.143	0.141	0.128	
Sulphate	12	256	500	10	10	12	2	7	5	10	5	12	6	9	4	9	3	$\sim\sim\sim\sim$
Total Dissolved Solids	231	366	500	252	268	305	289	252	245	291	256	267	242	242	285	291	297	M
Total Kjeldahl Nitrogen	0.2	N/L	N/L	0.3	0.2	0.8	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	$\sim \sim$
Zinc	0.005	2.5	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	< 0.005	< 0.005	
Notes: 1. Reasonable Use Concept (RUC 2. Ontario Drinking Water Standar 3. Results obtained from filed anal- All results are expressed in mg/L Bold and shaded values exceed the Bold and fitalic values exceed RUC N/L indicates No Limit. *** indicates results obtained from I ** indicates parameter not analyze	C) criteria. ds (ODWS). y analysis. ysis. e ODWS. imits. ab analysis d.																	






## Groundwater Quality Black Donald Waste Disposal Site

Parameter	ODWS ¹	BH4	BH4 BH1						
		29-Apr-09	3-May-10	16-May-11	16-Apr-12	08-May-17	04-May-22		
Acetone	N/L	-	-	-	-	0.008	0.03		
Benzene	0.001	< 0.001	0.00066	< 0.0005	0.0008	< 0.0005	< 0.0005		
Bromobenzene	N/L	-	-	-	-	< 0.0001	< 0.0004		
Bromodichloromethane	N/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.002		
Bromoform	N/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.005		
Bromomethane	N/L	< 0.0009	< 0.0005	< 0.0015	< 0.0005	< 0.0003	< 0.0005		
	0.002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002		
Chloroothopo	0.00	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0002	< 0.0005		
Chloroform	N/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.0001	< 0.003		
Chloromethane	N/L	< 0.0000	< 0.0003	< 0.0000	< 0.0005	< 0.0003	< 0.001		
Chlorotoluene.2-	N/L	-	-	-	-	< 0.0002	< 0.0002		
Chlorotoluene.4-	N/L	-	-	-	-	< 0.0002	< 0.0002		
Dibromo-3-Chloropropane, 1,2-	N/L	-	-	-	-	< 0.001	< 0.0006		
Dibromochloromethane	N/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.002		
Dibromoethane,1,2- (Ethylene Dibromide)	N/L	< 0.001	< 0.0002	< 0.0002	< 0.0002	< 0.0001	< 0.0002		
Dibromomethane	N/L	-	-	-	-	< 0.001	< 0.0001		
Dichlorobenzene,1,2-	0.2	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Dichlorobenzene,1,3-	N/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Dichlorobenzene,1,4-	0.005	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0002	< 0.0005		
Dichlorodifluoromethane	N/L	-	-	-	-	< 0.001	< 0.002		
Dichloroethane,1,1-	N/L	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Dichloroethane,1,2-	0.005	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Dichloroethene, cis-1,2-	N/L	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Dichloroethene, trans-1,2-	N/L	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Dichloroethene,1,1-	0.014	< 0.00066	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Dichloromethane (Methylene Chloride)	0.05	< 0.005	< 0.002	< 0.0005	< 0.0005	< 0.0003	< 0.005		
Dichloropropane, 1,2-	N/L	< 0.0007	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Dichloropropane 2.2-	N/L	-	-	-	-	< 0.0002	< 0.0002		
Dichloropropene, cis-1.3-	N/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0002	< 0.0002		
Dichloropropene, trans-1.3-	N/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Dichloropropene, 1, 1-	N/L	-	-	-	-	< 0.0002	< 0.0002		
Ethylbenzene	0.0024	< 0.001	0.0014	< 0.0005	< 0.0005	< 0.0005	< 0.0005		
Hexachlorobutadiene	N/L	-	-	-	-	< 0.001	< 0.0006		
Hexane	N/L	-	-	-	-	< 0.001	< 0.005		
Isopropylbenzene	N/L	-	-	-	-	< 0.0002	< 0.0002		
Isopropyltoluene,4-	N/L	-	-	-	-	< 0.0004	< 0.0002		
Methyl Butyl Ketone	N/L	-	-	-	-	< 0.01	< 0.005		
Methyl Ethyl Ketone	N/L	-	-	-	-	0.002	< 0.02		
Methyl Isobutyl Ketone	N/L	-	-	-	-	< 0.001	< 0.02		
Methyl-t-butyl Ether	N/L	-	-	-	-	0.001	< 0.002		
Naphthalene	N/L	-	-	-	-	< 0.0007	< 0.0004		
	N/L	-	-	-	-	< 0.0007	< 0.0004		
	IN/L	-	-	-	-	< 0.0004	< 0.0001		
Sturene	N/L	-	-	-	-	< 0.0005	< 0.0001		
tert-Butylbenzene	N/L					< 0.0000	< 0.0000		
Tetrachloroethane 1 1 1 2-	N/L	< 0.002	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0001		
Tetrachloroethane 1,1,2,2-	N/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0004	< 0.0005		
Tetrachloroethene	0.03	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0002	< 0.0005		
Toluene	0.024	< 0.0008	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005		
Trichlorobenzene,1,2,3-	N/L	-	-	-	-	< 0.0002	< 0.0005		
Trichlorobenzene,1,2,4-	N/L	-	-	-	-	< 0.0002	< 0.0005		
Trichloroethane,1,1,1-	N/L	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Trichloroethane,1,1,2-	N/L	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Trichloroethylene	0.005	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0001	< 0.0005		
Trichlorofluoromethane	N/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.0001	< 0.005		
Trichloropropane,1,2,3-	N/L	-	-	-	-	< 0.0002	< 0.0005		
Trimethylbenzene,1,2,4-	N/L	-	-	-	-	< 0.002	< 0.001		
Trimethylbenzene,1,3,5-	N/L	-	-	-	-	< 0.0006	< 0.0001		
Vinyi Chloride	0.001	< 0.0005	< 0.0005	< 0.0002	0.00022	< 0.0002	< 0.0002		
Aylene (Total)	0.3	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005		
Aylene o	N/L N/I	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0004	< 0.000		
Notes:	IN/L	S 0.00 I	< 0.0000	~ 0.0005	~ 0.0005	< 0.000 I	< 0.0005		

1. Ontario Drinking Water Standards (ODWS).



#### GREATER MADAWASKA

### Surface Water Quality Black Donald Waste Disposal Site

Parameter	Background	PWOO ¹								SW-3								5-year Trends
i didine di	(75th Percentile)	Filido	24-May-16	08-May-17	18-Sep-17	25-Oct-17	02-May-18	30-Oct-18	14-May-19	23-Apr-20	19-Aug-20	27-Oct-20	18-May-21	19-Aug-21	04-Nov-21	04-May-22	27-Oct-22	(sparkline)
Alkalinity (as CaCO ₃ )	228	25% Decrease	126	62	185	143	78	155	78	81	154	134	121	228	120	94	158	$\sim \sim \sim$
Ammonia, Total (as N)	0.1	N/L	< 0.01	< 0.01	0.02	0.02	< 0.01	0.04	0.04	0.02	< 0.01	0.01	< 0.01	0.12	0.02	< 0.01	0.03	
Ammonia, Un-ionized (as N) ²	0.00145	0.02	0.00001	0.00011	0.00004	0.00036	0.00038	0.00010	0.00023	0.00010	0.00003	0.00003	0.00006	0.00703	0.00010	0.00004	0.00005	
Barium	0.065	N/L	0.024	0.008	0.036	0.019	0.008	0.034	0.013	0.012	0.025	0.018	0.020	0.035	0.022	0.016	0.086	~~~
Boron	0.006	0.2	0.007	< 0.005	0.006	0.006	0.006	< 0.005	< 0.005	< 0.005	0.009	0.008	0.006	0.006	0.005	0.006	< 0.005	
Biological Oxygen Demand	4	N/L	< 3	< 2	< 2	< 2	< 2	< 3	< 3	< 3	20	< 3	< 3	< 3	< 3	< 3	< 3	
Cadmium	0.0000155	0.0002	< 0.00002	< 0.000014	< 0.000014	< 0.000014	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	0.000015	< 0.000015	0.000032	0.000018	0.000058	$\sim$
Calcium	89	N/L	45.8	22.4	66.4	44.3	22.7	66.0	30.5	32.8	63.4	51.2	43.1	79.7	41.6	31.6	56.4	$\sim$
Chromium	0.001	0.001	< 0.002	< 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	
Chloride	73	N/L	< 0.5	< 0.5	0.5	1.0	< 0.5	0.8	0.7	0.9	1.4	1.2	0.7	1.1	0.7	< 0.5	0.8	$\sim\sim$
Chemical Oxygen Demand	21	N/L	8	10	20	12	12	9	40	13	19	13	10	21	15	8	26	Sm
Conductivity (µS/cm) 3	591	N/L	261	136	370	278	169	-	169	-	-	283	-	-	-	-	-	$\wedge \Lambda$
Conductivity (µS/cm) 4	501	N/L	193	78	273	203	115	181	104	92	244	228	174	283	161	164	226	$\sim$
Copper	0.001	0.005	0.0006	0.0006	0.0001	0.0002	0.0005	0.0005	0.0006	0.0005	0.0007	0.0004	0.0010	0.0003	0.0008	0.0013	0.0015	
Dissolved Oxygen ⁴	9.44	5	9.00	12.34	7.50	4.62	9.06	4.16	8.42	10.48	5.09	8.75	6.30	9.90	7.27	9.81	5.73	$\sqrt{m}$
Dissolved Organic Carbon	8.5	N/L	4.3	5.4	6.2	7.1	3.9	6.2	5.1	4.2	5.9	6.2	5.8	8.8	5.7	5.2	8.0	$\sim \sim$
Hardness (as CaCO ₃ )	263	N/L	136	67	202	134	68	201	90	97	184	152	127	235	125	94	168	$\sim$
Iron	0.087	0.3	0.291	0.051	0.118	0.044	0.008	0.100	0.055	0.015	0.016	0.073	0.098	0.309	0.456	0.178	3.76	
Magnesium	11	N/L	5.26	2.66	8.75	5.54	2.73	8.65	3.45	3.54	6.16	5.79	4.62	8.68	5.13	3.57	6.47	$\wedge \sim$
Manganese	0.034	N/L	0.250	0.003	0.235	0.074	0.001	0.079	0.016	0.001	0.034	0.046	0.026	0.912	0.550	0.134	4.45	
Nitrate (as N)	0.06	N/L	< 0.1	< 0.05	< 0.05	< 0.05	0.19	< 0.05	0.18	0.06	< 0.05	< 0.05	0.11	0.09	< 0.05	0.08	0.10	$\mathbb{N}$
Nitrite (as N)	0.06	N/L	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05	
pH (units) ⁴	7.81	6.5 - 8.5	6.78	7.98	6.89	7.97	8.44	7.32	7.61	7.70	7.11	7.39	7.52	8.29	7.64	7.41	7.05	ha
Phenols	0.002	0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	Λ
Phosphorus, Total	0.024	0.03	< 0.01	0.01	0.03	0.02	0.01	< 0.01	0.05	< 0.01	0.01	0.01	0.03	0.05	0.04	0.02	0.13	~~
Potassium	1.91	N/L	0.8	0.3	0.8	1.0	0.7	0.4	0.5	0.5	0.4	0.9	0.8	1.4	0.9	0.6	1.5	$\sim$
Sodium	37	N/L	1.3	0.5	5.8	1.2	0.9	2.7	1.1	1.3	1.2	1.5	1.5	1.6	1.5	1.4	1.6	1
Strontium	0.18	N/L	0.076	0.035	0.149	0.076	0.035	0.133	0.047	0.047	0.087	0.075	0.067	0.127	0.065	0.050	0.091	$\sim$
Sulphate	7.15	N/L	7	5	< 1	2	4	4	5	6	9	4	7	< 1	3	6	1	
Total Dissolved Solids	355	N/L	136	75	204	153	86	163	86	92	176	145	121	225	124	97	162	$\sim$
Total Kjeldahl Nitrogen	0.5	N/L	0.19	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.5	0.5	0.2	0.7	_~~~
Total Suspended Solids	4	N/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3	3	< 3	< 3	29	4	< 3	< 3	66.0	
Zinc	0.007	0.02	< 0.005	0.012	0.038	0.042	< 0.005	0.012	0.006	< 0.005	< 0.005	0.005	0.026	0.014	0.010	< 0.005	0.013	$\sim$

Notes:
Note:
Notes:
Note:
N



#### GREATER MADAWASKA

### Surface Water Quality Black Donald Waste Disposal Site

Descenter	Background	<b>T</b> W001							s	W-4 (Backgrou	nd)							5-year Trends
Parameter	(75th Percentile)	PWQO .	24-May-16	08-May-17	18-Sep-17	25-Oct-17	02-May-18	30-Oct-18	14-May-19	23-Apr-20	19-Aug-20	27-Oct-20	18-May-21	19-Aug-21	04-Nov-21	04-May-22	18-Aug-22	(sparkline)
Alkalinity (as CaCO ₃ )	228	25% Decrease	196	133	246	216	138	226	145	144	214	220	202	243	227	170	233	$\wedge \sim \sim$
Ammonia, Total (as N)	0.1	N/L	< 0.01	< 0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.01	0.16	0.05	0.02	0.01	0.04	Λ.
Ammonia, Un-ionized (as N) 2	0.00145	0.02	0.00016	0.00011	0.00012	0.00023	0.00029	0.00009	0.00019	0.00006	0.00020	0.00002	0.00252	0.00338	0.00010	0.00008	0.00038	$\overline{\Lambda}$
Barium	0.065	N/L	0.052	0.028	0.065	0.051	0.036	0.067	0.045	0.034	0.078	0.067	0.049	0.069	0.052	0.042	0.060	$\sim$
Boron	0.006	0.2	0.006	< 0.005	< 0.005	0.006	0.005	< 0.005	< 0.005	< 0.005	0.092	0.007	0.006	0.007	0.005	0.005	0.007	
Biological Oxygen Demand	4	N/L	< 3	< 2	< 2	< 2	< 2	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	
Cadmium	0.0000155	0.0002	0.00003	< 0.000014	0.000017	< 0.000014	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	0.000018	< 0.000015	< 0.000015	< 0.000015	< 0.000015	
Calcium	89	N/L	71.1	45.2	86.6	74.2	52.1	101	62.0	56.2	93.9	104	71.3	88.1	86.7	59.2	80.8	N
Chromium	0.001	0.001	< 0.002	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
Chloride	73	N/L	47.1	23.8	55.8	60.2	37.2	72.7	56.5	35.5	46.6	80.8	37.4	56.0	78.6	45.1	60.7	$\wedge \wedge \wedge$
Chemical Oxygen Demand	21	N/L	15	11	24	13	12	19	16	12	26	18	12	27	10	6	28	$\sim \sim$
Conductivity (µS/cm) 3	591	N/L	542	361	345	640	388	-	473	-		683	-	-	-	-		$\sim \sim$
Conductivity (µS/cm) 4	501	N/L	436	213	515	464	263	396	298	209	429	546	345	421	457	267	528	$\sim \sim \sim$
Copper	0.001	0.005	0.0007	0.0006	0.0006	0.0003	0.0008	0.0003	0.0011	0.0008	0.0015	0.0006	0.0010	0.0010	0.0005	0.0007	0.0004	$\sim$
Dissolved Oxygen ⁴	9.44	5	9.56	14.37	4.05	6.32	9.30	3.40	10.28	11.37	5.12	9.40	7.99	2.90	8.36	8.06	4.11	$\sim$
Dissolved Organic Carbon	8.5	N/L	5.9	5.5	9.4	8.9	4.6	8.4	5.9	4.4	11.7	5.2	5.9	9.3	7.1	5.3	8.4	$\sim$
Hardness (as CaCO ₃ )	263	N/L	212	135	260	221	153	304	183	166	277	302	210	259	257	175	239	$\wedge \sim$
Iron	0.087	0.3	0.022	0.017	0.124	0.085	0.009	0.088	0.025	0.021	0.085	0.069	0.032	0.131	0.065	0.024	0.173	$\sim\sim\sim$
Magnesium	11	N/L	8.31	5.32	10.7	8.68	5.62	12.60	6.83	6.15	10.2	10.3	7.71	9.52	9.82	6.64	8.86	$\wedge \sim$
Manganese	0.034	N/L	0.018	0.001	0.054	0.052	0.002	0.042	0.002	0.002	0.031	0.020	0.006	0.056	0.023	0.001	0.037	$\sim\sim$
Nitrate (as N)	0.06	N/L	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.17	0.06	< 0.05	< 0.05	0.09	0.10	< 0.05	< 0.05	0.17	$\square$
Nitrite (as N)	0.06	N/L	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.10	< 0.05	< 0.05	< 0.05	< 0.05	$_ \land _$
pH (units) ⁴	7.81	6.5 - 8.5	7.82	7.95	7.36	7.78	8.28	7.55	7.80	7.74	7.58	7.14	7.93	8.29	7.62	7.67	7.48	$\sim$
Phenols	0.002	0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	Λ
Phosphorus, Total	0.024	0.03	0.03	0.01	0.03	0.02	0.01	< 0.01	0.02	< 0.01	0.01	< 0.01	0.08	0.02	0.03	0.08	0.03	$\sim \sim$
Potassium	1.91	N/L	1.6	0.8	1.5	1.4	1.3	1.5	1.5	1.2	1.6	1.9	1.8	2.1	2.0	1.5	1.9	$\sim \sim$
Sodium	37	N/L	32.3	16.6	36.6	36.6	19.6	32.7	30.4	22.5	29.6	38.4	28.8	36.9	41.7	26.0	34.3	$\sim$
Strontium	0.18	N/L	0.138	0.085	0.187	0.144	0.095	0.210	0.111	0.099	0.181	0.168	0.131	0.169	0.156	0.113	0.161	$\wedge \sim \sim$
Sulphate	7.15	N/L	7	5	< 1	1	6	6	7	7	10	2	8	< 1	< 1	8	1	-~~~
Total Dissolved Solids	355	N/L	285	199	190	352	200	355	245	211	309	355	261	338	351	238	319	$\wedge \sim$
Total Kjeldahl Nitrogen	0.5	N/L	0.29	0.2	0.3	0.3	0.2	0.3	0.2	0.1	0.4	0.3	0.7	0.4	0.3	0.8	0.4	$\sim$
Total Suspended Solids	4	N/L	5	< 3	< 3	4	< 3	3	< 3	4	< 3	< 3	5	6	< 3	< 3	270	/
Zinc	0.007	0.02	< 0.005	< 0.005	< 0.005	0.043	< 0.005	0.011	0.008	< 0.005	0.030	< 0.005	0.021	0.012	0.007	< 0.005	< 0.005	$\sim$
revers: 1. Provincial Water Quality Objectives 2. Calculated using Total Ammonia an 3. Results obtained from Indonatory an 4. Results obtained from India analysis. All results are expressed in mg/L unless Shaded area with bold text indicates Ph NL indicates No Limit. *** indicates results obtained from Iab and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second	(PWQO). d field analysis. alysis. s otherwise stated. WQO exceedance. analysis																	



#### GREATER MADAWASKA

### Surface Water Quality Black Donald Waste Disposal Site

Parameter	Background	PWQO ¹										SW-5										5-year Trends
	(75th Percentile)		19-Oct-15	08-May-17	18-Sep-17	25-Oct-17	02-May-18	14-Aug-18	30-Oct-18	14-May-19	20-Aug-19	16-Oct-19	23-Apr-20	19-Aug-20	27-Oct-20	18-May-21	19-Aug-21	04-Nov-21	04-May-22	18-Aug-22	27-Oct-22	(sparkline)
Alkalinity (as CaCO ₃ )	228	25% Decrease	160	132	180	138	105	189	165	111	154	147	145	143	148	144	184	136	129	173	180	$\sim$
Ammonia, Total (as N)	0.1	N/L	< 0.1	< 0.01	0.03	0.02	< 0.01	0.04	0.03	0.02	0.08	0.04	0.01	0.01	0.02	0.02	0.03	0.02	0.01	0.03	0.02	$\mathcal{A}$
Ammonia, Un-ionized (as N) 2	0.00145	0.02	0.00018	0.00008	0.00010	0.00032	0.00014	0.00032	0.00020	0.00017	0.00132	0.00038	0.00008	0.00025	0.00005	0.00012	0.00216	0.00010	0.00005	0.00077	0.00012	A
Barium	0.065	N/L	0.0396	0.028	0.052	0.040	0.029	0.056	0.059	0.037	0.048	0.042	0.032	0.061	0.048	0.042	0.058	0.039	0.034	0.052	0.049	M
Boron	0.006	0.2	0.0106	< 0.005	0.023	0.011	0.014	0.018	0.008	0.012	0.016	0.025	0.014	0.110	0.017	0.021	0.021	0.015	0.018	0.014	0.015	
Biological Oxygen Demand	4	N/L	< 4	< 2	< 2	< 2	< 2	< 2	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	
Cadmium	0.0000155	0.0002	< 0.000003	< 0.000014	< 0.000014	< 0.000014	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	
Calcium	89	N/L	56.0	46.8	60.0	43.1	35.3	60.4	67.0	44.4	55.6	52.0	44.7	64.4	58.8	49.2	64.0	50.3	41.9	63.2	64.0	$\wedge \sim$
Chromium	0.001	0.001	0.00004	< 0.001	< 0.001	< 0.002	< 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	
Chloride	73	N/L	13	14.9	5.0	2.6	6.0	8.0	9.0	7.6	5.9	6.8	5.6	9.9	8.5	4.5	9.9	5.6	6.6	4.7	5.4	M
Chemical Oxygen Demand	21	N/L	19	10	27	24	26	29	26	20	32	34	16	36	33	23	32	25	18	36	20	$\sim \sim \sim$
Conductivity (µS/cm) 3	591	N/L	-	330	660	278	227	388	-	256	-	-	-	-	338	-		-	-	-	-	$\Lambda \Lambda$
Conductivity (µS/cm) 4	501	N/L	240	202	300	217	156	352	227	171	230	361	150	259	272	232	268	202	169	321	256	M
Copper	0.001	0.005	0.00042	0.0004	< 0.0001	0.0001	0.0004	0.0003	0.0004	0.0005	0.0005	0.0006	0.0007	0.0003	0.0004	0.0005	0.0003	0.0003	0.0006	0.0004	0.0003	M
Dissolved Oxygen 4	9.44	5	5.88	7.70	4.69	8.89	8.72	2.80	5.20	8.71	2.97	4.57	11.30	8.17	5.63	5.43	3.89	4.67	6.34	6.03	6.97	w
Dissolved Organic Carbon	8.5	N/L	8.4	6.4	12.1	13.7	5.7	12.4	11.9	8.0	12.0	11.1	6.6	16.2	12.2	11.1	13.1	12.5	8.8	16.8	11.4	$\sim\sim\sim$
Hardness (as CaCO ₃ )	263	N/L	171	148	186	134	107	183	208	134	168	160	136	194	177	150	193	154	128	191	193	$\wedge \sim$
Iron	0.087	0.3	0.165	0.029	0.228	0.079	0.034	0.797	0.380	0.051	0.329	0.244	0.030	0.267	0.158	0.049	0.424	0.122	0.087	0.216	0.125	M
Magnesium	11	N/L	7.60	7.50	8.86	6.41	4.62	7.90	9.93	5.64	7.15	7.23	5.80	8.00	7.31	6.47	8.07	6.92	5.62	7.99	8.09	Am
Manganese	0.034	N/L	0.0122	0.017	0.037	0.012	0.002	0.146	0.077	0.003	0.052	0.022	0.002	0.032	0.025	0.034	0.086	0.013	0.004	0.019	0.022	Mr
Nitrate (as N)	0.06	N/L	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.18	0.06	< 0.05	0.06	< 0.05	< 0.05	0.08	0.09	< 0.05	0.08	< 0.05	0.11	Aw
Nitrite (as N)	0.06	N/L	< 0.03	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
pH (units) ⁴	7.81	6.5 - 8.5	7.15	7.78	7.03	7.89	7.91	7.31	7.70	7.68	7.60	7.74	7.74	7.84	7.33	7.28	8.26	7.59	7.36	7.77	7.54	m
Phenols	0.002	0.001	0.001	0.004	< 0.001	< 0.001	< 0.001	< 0.002	0.004	< 0.002	0.003	0.005	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	$\mathcal{M}$
Phosphorus, Total	0.024	0.03	0.027	0.02	0.01	0.01	0.01	0.06	< 0.01	0.02	0.05	0.03	< 0.01	0.02	0.01	0.02	0.02	0.01	0.01	0.01	< 0.01	$\mathcal{M}$
Potassium	1.91	N/L	0.860	1.3	0.5	1.3	0.8	0.9	2.0	0.8	0.5	1.0	0.8	0.6	2.3	1.0	0.7	1.1	0.8	0.9	1.3	M
Sodium	37	N/L	5.41	5.9	4.4	2.1	4.0	5.4	6.4	5.1	4.1	4.3	4.5	7.0	4.9	4.4	6.6	3.7	5.2	5.2	5.0	M
Strontium	0.18	N/L	0.0974	0.087	0.134	0.084	0.065	0.128	0.156	0.079	0.110	0.102	0.078	0.132	0.103	0.094	0.124	0.094	0.079	0.119	0.118	Am
Sulphate	7.15	N/L	5	6	< 1	2	3	1	3	5	5	24	5	6	3	4	1	3	5	2	2	A
Total Dissolved Solids	355	N/L	226	182	363	153	116	200	192	131	170	165	131	173	174	148	206	152	139	170	190	M
Total Kjeldahl Nitrogen	0.5	N/L	< 0.5	0.3	0.4	0.3	0.2	0.5	0.5	0.3	0.6	0.6	0.2	0.5	0.5	0.3	0.4	0.5	0.3	0.6	0.4	$\sim \sim \sim \sim$
Total Suspended Solids	4	N/L	2	< 3	< 3	< 3	< 3	6	< 3	3	11	5	< 3	< 3	5	< 3	4	< 3	< 3	3	< 3	Mm
Zinc	0.007	0.02	< 0.002	< 0.005	0.005	1.60	< 0.005	0.017	0.018	0.005	< 0.005	< 0.005	< 0.005	0.027	< 0.005	0.019	0.011	0.009	0.010	0.016	0.023	N

Notes:
Note:
Notes:
Note:
N





#### Surface Water Quality

ounded mater au	
Black Donald Was	te Disposal Site

Parameter	Background	PWOO 1											SW-6											5-year Trends
	(75th Percentile)	, indo	24-May-16	31-Aug-16	26-Oct-16	08-May-17	18-Sep-17	25-Oct-17	02-May-18	14-Aug-18	30-Oct-18	14-May-19	20-Aug-19	16-Oct-19	23-Apr-20	19-Aug-20	27-Oct-20	18-May-21	19-Aug-21	04-Nov-21	04-May-22	18-Aug-22	27-Oct-22	(sparkline)
Alkalinity (as CaCO ₃ )	228	25% Decrease	174	213	198	99	184	176	109	225	177	121	215	188	124	159	170	150	196	178	136	197	189	$M \sim $
Ammonia, Total (as N)	0.1	N/L	< 0.01	0.08	< 0.01	< 0.01	0.02	0.02	< 0.01	0.02	0.02	0.02	0.05	0.03	0.01	< 0.01	0.01	0.01	0.03	0.01	< 0.01	0.02	< 0.01	
Ammonia, Un-ionized (as N) ²	0.00145	0.02	0.00013	0.00216	0.00005	0.00007	0.00005	0.00024	0.00018	0.00038	0.00018	0.00023	0.00097	0.00028	0.00009	0.00017	0.00002	0.00005	0.00429	0.00007	0.00007	0.00041	0.00007	$\sim \Lambda_{\circ}$
Barium	0.065	N/L	0.0450	0.053	0.045	0.021	0.058	0.035	0.026	0.058	0.052	0.031	0.057	0.045	0.030	0.054	0.040	0.038	0.052	0.036	0.030	0.046	0.038	M
Boron	0.006	0.2	0.0070	0.015	< 0.005	0.008	0.016	0.010	0.011	0.015	< 0.005	0.006	0.009	0.010	0.010	0.095	0.012	0.018	0.014	0.010	0.012	0.007	0.010	
Biological Oxygen Demand	4	N/L	< 3	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	
Cadmium	0.0000155	0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.000014	< 0.000014	< 0.000014	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	
Calcium	89	N/L	62.9	78.2	84.6	37.2	68.2	55.8	39.1	77.5	72.9	46.4	83.4	71.5	52.4	70.5	71.2	53.0	74.6	67.4	46.7	69.9	63.2	$\sim \sim \sim$
Chromium	0.001	0.001	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.002	< 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	
Chloride	73	N/L	11	29.1	32.1	10.0	15.4	13.4	10.5	20.8	29.1	16.3	23.9	23.7	13.2	20.0	30.2	8.7	25.6	27.8	16.8	16.9	17.8	m
Chemical Oxygen Demand	21	N/L	16	17	7	16	28	19	20	29	18	19	22	15	19	29	16	20	24	13	14	35	40	m
Conductivity (µS/cm) 3	591	N/L	385	511	-	243	361	390	256	499	-	304	-	-	-	-	446	-	-	-	-	-	-	$\Lambda_{-}$
Conductivity (µS/cm) 4	501	N/L	320	427	305	151	321	283	173	417	260	195	344	527	157	299	360	236	300	285	186	362	296	$\sim$
Copper	0.001	0.005	0.00020	0.0004	0.0002	0.0005	0.0003	0.0002	0.0004	0.0003	0.0003	0.0005	0.0002	0.0004	0.0004	0.0007	0.0005	0.0006	0.0004	0.0003	0.0014	0.0003	0.0003	
Dissolved Oxygen ⁴	9.44	5	12.80	9.2	7.78	13.93	8.83	10.57	10.65	7.66	10.65	11.50	6.75	6.25	14.85	8.82	13.69	8.23	6.98	12.9	8.21	8.03	10.06	M
Dissolved Organic Carbon	8.5	N/L	7.2	6.6	6.4	7.9	10.8	11.0	5.9	12.0	7.3	7.5	9.3	6.2	6.1	13.7	7.5	11.0	9.0	8.1	8.1	13.4	9.4	m
Hardness (as CaCO ₃ )	263	N/L	189	236	256	112	209	169	117	237	226	139	249	218	156	210	212	158	222	203	140	208	190	$\sim$
Iron	0.087	0.3	0.065	0.510	0.112	0.022	0.221	0.122	0.024	0.323	0.161	0.048	0.991	1.34	0.036	0.266	0.139	0.235	0.211	0.110	0.036	0.154	0.086	A
Magnesium	11	N/L	7.80	9.93	10.9	4.64	9.46	7.22	4.63	10.5	10.7	5.49	9.96	9.55	6.02	8.14	8.31	6.32	8.75	8.47	5.57	8.19	7.73	$\wedge \sim \sim$
Manganese	0.034	N/L	0.0280	0.085	0.017	0.002	0.052	0.021	0.002	0.500	0.028	0.005	0.370	0.181	0.006	0.041	0.025	0.049	0.038	0.018	0.003	0.018	0.015	$\Lambda$
Nitrate (as N)	0.06	N/L	< 0.1	0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.17	0.06	< 0.05	0.07	< 0.05	< 0.05	0.10	0.11	< 0.05	0.08	< 0.05	0.08	$\sum$
Nitrite (as N)	0.06	N/L	< 0.1	< 0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
pH (units) ⁴	7.81	6.5 - 8.5	7.60	7.86	7.69	7.72	6.98	7.79	8.06	7.77	7.89	7.85	7.87	7.80	7.87	7.75	7.25	7.33	8.65	7.82	7.54	7.78	7.61	$\sim\sim\sim\sim$
Phenols	0.002	0.001	< 0.001	< 0.001	< 0.001	0.006	< 0.001	< 0.001	< 0.001	< 0.002	0.004	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	Λ
Phosphorus, Total	0.024	0.03	< 0.01	< 0.01	0.01	0.02	0.02	0.03	< 0.01	0.03	< 0.01	0.02	0.04	0.03	< 0.01	0.02	< 0.01	0.03	0.01	< 0.01	< 0.01	< 0.01	0.01	$\sim$
Potassium	1.91	N/L	1.00	1.5	1.6	0.6	0.9	1.3	0.9	1.6	1.6	0.9	0.9	2.9	0.8	0.9	1.5	0.9	1.2	1.3	1.0	1.1	1.5	$\sim$
Sodium	37	N/L	8.3	13.8	15.9	7.8	13.3	9.6	6.6	13.2	16.0	9.6	12.5	11.1	8.7	11.9	16.8	7.1	15.7	16.4	9.7	11.4	11.4	$\sim\sim\sim\sim$
Strontium	0.18	N/L	0.123	0.172	0.186	0.070	0.184	0.114	0.072	0.182	0.181	0.087	0.164	0.149	0.090	0.149	0.136	0.104	0.157	0.133	0.090	0.140	0.123	//////
Sulphate	7.15	N/L	6	10	14	4	1	3	4	1	6	6	2	7	6	6	7	6	2	6	7	2	3	$\sim\sim\sim$
Total Dissolved Solids	355	N/L	201	271	278	134	199	215	131	258	236	156	253	241	154	206	230	161	245	228	161	213	218	$\sim \sim \sim \sim$
Total Kjeldahl Nitrogen	0.5	N/L	0.2	0.4	0.2	0.3	0.4	0.3	0.2	0.5	0.3	0.2	0.3	0.4	0.2	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.3	$\wedge \sim \sim$
Total Suspended Solids	4	N/L	< 3	< 3	4	< 3	3	< 3	< 3	< 3	4	< 3	5	11	3	3	< 3	7	< 3	< 3	< 3	3	< 3	$\sim \sim $
Zinc	0.007	0.02	< 0.005	< 0.005	< 0.005	< 0.005	0.065	0.016	< 0.005	0.021	0.012	0.007	< 0.005	< 0.005	< 0.005	0.025	< 0.005	0.013	0.009	0.006	< 0.005	< 0.005	< 0.005	$\sim \sim$
Notes: 1. Provincial Water Quality Objectives 2. Calculated using Total Ammonia am 3. Results obtained from ited analysis: All results are expressed in mg/L unless Shaded area with bold text indicates Ph NL indicates No Limit. *** indicates results obtained from lab a	(PWQO). d field analysis. alysis. s otherwise stated. WQO exceedance. analysis																							



# Appendix G Groundwater Elevations 2023

#### **Groundwater Elevations 2024**

Black Donald WDS

Monitor	Top of Pipe Elevation	Ground Elevation	Depth of Well	Jun	-23	Nov	v-23	Apr	-24	Nov	<i>v</i> -24
	(Assumed Datum)	(Assumed Datum)	Bottom (M)	Water Level	Elevation	Water Level	Elevation	Water Level	Elevation	Water Level	Elevation
ВН 1	94.18	93.60	8.83	5.21	88.97	7.10	87.08	4.00	90.18	6.22	87.96
ВН 2	99.79	98.98	7.91	4.43	95.36	5.08	94.71	3.13	96.66	4.45	95.34
ВН 3	100.67	99.80	8.61								
ВН 4	96.80	95.96	7.80	3.70	93.10	4.67	92.13	3.23	93.57	4.19	92.61
MW-08-5	106.06	105.03	13.56	13.51	92.55	Dry	106.06	13.42	92.64	13.47	92.59
MW 08-6	103.22	102.23	23.80	5.50	97.72	5.68	97.54	5.28	97.94	5.54	97.68
MW 08-7S (Previously MW 08-7)	78.72	77.79	8.46	1.20	77.52	3.30	75.42	0.81	77.91	2.72	76.00
MW 23-7D (Previously MW 08-7D)	78.00	hold	16.56			3.38	74.62	0.78	77.22	3.38	74.62
BH 23-8S	93.60	93.60	14.35			Dry		Dry		Dry	
BH 23-8D	93.60	93.60	20.50			Dry		Dry		Dry	

Note: 1. Well depths based on Jp2g measurements in 2023

2. Elevations based on SGS Lakefield Research Ltd.

3. Elevations are assumed

4. MW 08-7D Installed Nov 2023

5. BH 23-8 D/S Installed Nov 2023

# Appendix H Laboratory Certificates of Analysis 2023

CERTIFICATE OF ANALYSIS

CADUCE ENVIRONMENTAL LABORATOR Client committed, Quality assured, Canadian owned.

#### C.O.C.: G 110322

#### **Report To:**

Jp2g Consultants Inc 1150 Morrison Dr. Ottawa, ON K2H 8S9

#### Attention: Nick Weston

DATE RECEIVED: 2024-Apr-16 DATE REPORTED: 2024-Apr-25 P.O. NUMBER: Ground Water SAMPLE MATRIX: Authorized Lab Method Reference Method Analyses Qty Site Analyzed Date Analyzed Anions (Liquid) 7 OTTAWA LMACGREGOR 2024-Apr-17 A-IC-01 SM 4110B COD (Liquid) 7 KINGSTON EHINCH 2024-Apr-19 SM 5220D COD-001 Cond/pH/Alk Auto (Liquid) 7 OTTAWA SLOZO 2024-Apr-17 COND-02/PH-02/A SM 2510B/4500H/ LK-02 2320B 7 DOC/DIC (Liquid) VKASYAN 2024-Apr-18 OTTAWA C-OC-01 EPA 415.2 Ion Balance (Calc.) 7 OTTAWA STAILLON CP-028 **MECP E3196** ICP/MS (Liquid) 7 OTTAWA TPRICE 2024-Apr-19 D-ICPMS-01 EPA 200.8 ICP/OES (Liquid) 7 **APRUDYVUS** 2024-Apr-17 D-ICP-01 OTTAWA SM 3120B Ammonia & o-Phosphate (Liquid) 7 KINGSTON **JYEARWOOD** 2024-Apr-23 NH3-001 SM 4500NH3 Phenols (Liquid) 7 KINGSTON **JMACINNES** 2024-Apr-22 PHEN-01 **MECP E3179** 

**KDIBBITS** 

KINGSTON

TP & TKN (Liquid) R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *

7

Michelle Dubien

**Data Specialist** 

#### **Final Report**

MECP E3516.2

REPORT No: 24-010390 - Rev. 0

## **CADUCEON Environmental Laboratories**

Ottawa, ON K1V 7P1

2024-Apr-19

Black & Donald WDS CUSTOMER PROJECT:

TPTKN-001

# 2378 Holly Lane

#### **CADUCEON Environmental Laboratories Certificate of Analysis**

Final Report REPORT No: 24-010390 - Rev. 0

	Client I.D. Sample I.D.		MW08-6	BH-1	MW08-7S	MW08-7D	BH-2
	Samj Date Col	DIE I.D.	24-010390-1	24-010390-2	24-010390-3	24-010390-4	24-010390-5
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	182	359	202	374	228
Chloride	mg/L	0.5	1.7	3.8	62.1	22.7	1.8
Nitrate (N)	mg/L	0.05	<0.05	0.17	<0.05	0.14	<0.05
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	10	11	14	21	13
Phosphorus (Total)	mg/L	0.01	0.03	0.04	0.24	3.76	0.03
Total Kjeldahl Nitrogen	mg/L	0.1	0.2	0.6	0.2	2.1	0.2
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	<0.05	0.44	<0.05	<0.05	<0.05
Dissolved Organic Carbon	mg/L	0.2	4.9	5.8	3.9	9.4	2.8
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
СОД	mg/L	5	<5	10	<5	70	22
Hardness (as CaCO3)	mg/L	0.02	164	281	225	369	216
Aluminum	mg/L	0.01	0.07	0.02	0.02	0.05	0.02
Barium	mg/L	0.001	0.020	0.021	0.044	0.076	0.015
Boron	mg/L	0.005	0.009	0.136	0.013	0.471	0.007
Calcium	mg/L	0.02	60.7	79.9	74.0	125	81.8
Iron	mg/L	0.005	0.172	0.194	0.011	<0.005	0.007
Magnesium	mg/L	0.02	2.85	19.8	9.60	13.6	2.76
Manganese	mg/L	0.001	0.002	0.074	<0.001	0.015	<0.001
Potassium	mg/L	0.1	2.0	1.8	1.6	1.9	2.8
Silicon	mg/L	0.01	3.57	9.06	3.72	4.00	6.02

Michelle Dubien Data Specialist

#### **CADUCEON Environmental Laboratories Certificate of Analysis**

Final Report REPORT No: 24-010390 - Rev. 0

	Cli	ent I.D.	MW08-6	BH-1	MW08-7S	MW08-7D	BH-2
	Sam	ple I.D.	24-010390-1	24-010390-2	24-010390-3	24-010390-4	24-010390-5
	Date Co	llected	2024-04-15	2024-04-15	2024-04-15	2024-04-15	2024-04-15
Parameter	Units	R.L.	-	-	-	-	-
Sodium	mg/L	0.2	2.1	30.9	25.3	17.5	2.6
Strontium	mg/L	0.001	0.288	0.265	0.151	0.303	0.174
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cadmium	mg/L	0.00001 5	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001	0.0009	0.0024	0.0001	0.0007	0.0002
Copper	mg/L	0.0001	0.0016	0.0023	0.0015	0.0016	0.0013
Anion Sum	meq/L	-	3.90	7.53	6.09	8.54	4.89
Cation Sum	meq/L	-	3.42	7.03	5.63	8.18	4.50
% Difference	%	-	6.56	3.46	3.94	2.18	4.15
Ion Ratio	-	-	1.14	1.07	1.08	1.04	1.09
Sodium Adsorption Ratio	-	-	0.0709	0.803	0.734	0.396	0.0781
TDS (Ion Sum Calc)	mg/L	1	189	364	308	426	242
TDS(calc.)/EC(actual)	-	-	0.537	0.545	0.514	0.539	0.529
Conductivity Calc	µmho/cm	-	345	641	581	756	438
Conductivity Calc / Conductivity	-	-	0.977	0.960	0.968	0.957	0.956
Langelier Index(25°C)	-	-	0.621	0.965	0.693	1.10	0.839
Saturation pH (25°C)	-	-	7.38	6.99	7.27	6.79	7.16
pH (Client Data)	pH units	-	5.8	6.3	6.7	6.8	6.9
Temperature (Client Data)	°C		8.8	9.0	6.8	7.4	8.1

Michelle Dubien Data Specialist

	CI	ient I.D.	BH-4	Dup #1
Parameter	San Date C Units	nple I.D. ollected R.L.	24-010390-6 2024-04-15 -	24-010390-7 2024-04-15 -
Alkalinity(CaCO3) to pH4.5	mg/L	5	577	379
Chloride	mg/L	0.5	12.1	22.8
Nitrate (N)	mg/L	0.05	0.50	0.13
Nitrite (N)	mg/L	0.05	<0.05	<0.05
Sulphate	mg/L	1	352	21
Phosphorus (Total)	mg/L	0.01	0.08	2.82
Total Kjeldahl Nitrogen	mg/L	0.1	1.6	2.1
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.29	<0.05
Dissolved Organic Carbon	mg/L	0.2	27.8	9.7
Phenolics	mg/L	0.001	<0.001	<0.001
COD	mg/L	5	92	69
Hardness (as CaCO3)	mg/L	0.02	799	370
Aluminum	mg/L	0.01	0.11	0.04
Barium	mg/L	0.001	0.263	0.077
Boron	mg/L	0.005	0.782	0.476
Calcium	mg/L	0.02	276	126
Iron	mg/L	0.005	0.392	<0.005
Magnesium	mg/L	0.02	26.2	13.6
Manganese	mg/L	0.001	30.2	0.017
Potassium	mg/L	0.1	14.7	1.9
Silicon	mg/L	0.01	7.66	3.96

Г

	Cli	ient I.D.	BH-4	Dup #1
	Sam	ple I.D.	24-010390-6	24-010390-7
	Date Co	ollected	2024-04-15	2024-04-15
Parameter	Units	R.L.	-	-
Sodium	mg/L	0.2	96.1	17.4
Strontium	mg/L	0.001	0.843	0.306
Zinc	mg/L	0.005	<0.005	<0.005
Cadmium	mg/L	0.00001 5	<0.000015	<0.000015
Chromium	mg/L	0.001	<0.001	<0.001
Cobalt	mg/L	0.0001	0.0053	0.0007
Copper	mg/L	0.0001	0.0011	0.0015
Anion Sum	meq/L	-	19.2	8.65
Cation Sum	meq/L	-	21.6	8.20
% Difference	%	-	5.86	2.69
Ion Ratio	-	-	0.889	1.06
Sodium Adsorption Ratio	-	-	1.48	0.394
TDS (Ion Sum Calc)	mg/L	1	1160	430
TDS(calc.)/EC(actual)	-	-	0.665	0.531
Conductivity Calc	µmho/cm	-	1620	761
Conductivity Calc / Conductivity	-	-	0.934	0.939
Langelier Index(25°C)	-	-	1.52	0.975
Saturation pH (25°C)	-	-	6.31	6.79
pH (Client Data)	pH units	-	6.8	
Temperature (Client Data)	°C	-	8.9	

Michelle Dubien Data Specialist

**CERTIFICATE OF ANALYSIS** 

C A D U C E ENVIRONMENTAL LABORATORIES Client committed. Quality assured. Canadian owned.

2024-Nov-12

2024-Nov-22

#### C.O.C.: G 111442

#### **Report To:**

Jp2g Consultants Inc 1150 Morrison Dr. Ottawa, ON K2H 8S9

#### Attention: Nick Weston

DATE RECEIVED: DATE REPORTED:

#### CADUCEON Environmental Laboratories 2378 Holly Lane Ottawa, ON K1V 7P1

CUSTOMER PROJECT: 22-6213C Black Donald P.O. NUMBER:

SAMPLE MATRIX:	Ground Water						
Analyses		Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)		6	OTTAWA	PCURIEL	2024-Nov-13	A-IC-01	SM 4110B
COD (Liquid)		6	KINGSTON	DCASSIDY	2024-Nov-15	COD-001	SM 5220D
Cond/pH/Alk Auto (Liquid	)	6	OTTAWA	SBOUDREAU	2024-Nov-13	COND-02/PH-02/A	SM 2510B/4500H/
						LK-02	2320B
DOC/DIC (Liquid)		6	OTTAWA	TPRICE	2024-Nov-18	C-OC-01	EPA 415.2
ICP/MS (Liquid)		6	OTTAWA	AOZKAYMAK	2024-Nov-15	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)		6	OTTAWA	APRUDYVUS	2024-Nov-14	D-ICP-01	SM 3120B
Ammonia & o-Phosphate	(Liquid)	6	KINGSTON	JYEARWOOD	2024-Nov-15	NH3-001	SM 4500NH3
Phenols (Liquid)		6	KINGSTON	EHINCH	2024-Nov-14	PHEN-01	MECP E3179
TP & TKN (Liquid)		6	KINGSTON	YLIEN	2024-Nov-19	TPTKN-001	MECP E3516.2

R.L. = Reporting Limit

NC = Not Calculated Test methods may be modified from specified reference method unless indicated by an *

Michelle Dubien Data Specialist

**Final Report** 

REPORT No: 24-035410 - Rev. 0

#### **CADUCEON Environmental Laboratories Certificate of Analysis**

Final Report REPORT No: 24-035410 - Rev. 0

Client I.D.		MW 08-7S	MW 08-7D	MW 08-6	BH 1	BH 4	
	•						2
	Sam	nle I D	24-035410-1	24-035410-2	24-035410-3	24-035410-4	24-035410-5
	Date Co	llected	2024-11-11	2024-11-11	2024-11-11	2024-11-11	2024-11-11
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	225	320	176	559	501
Conductivity @25°C	uS/cm	1	593	802	362	1060	1990
рН @25°С	pH units	-	8.11	7.69	8.03	7.72	7.36
Chloride	mg/L	0.5	48.2	45.7	0.7	5.0	6.0
Nitrate (N)	mg/L	0.05	<0.05	<0.05	<0.05	0.91	<0.05
Sulphate	mg/L	1	4	27	8	15	675
Phosphorus (Total)	mg/L	0.01	0.93	2.11	0.02	0.04	0.05
Total Kjeldahl Nitrogen	mg/L	0.1	0.2	0.7	0.1	1.3	1.0
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.09	0.19	0.08	1.27	0.40
Dissolved Organic Carbon	mg/L	0.8	3.7	7.2	3.0	8.0	14.5
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
COD	mg/L	5	30	116	<5	22	37
Hardness (as CaCO3)	mg/L	0.02	255	397	207	600	1090
Aluminum	mg/L	0.01	0.03	0.05	0.02	0.05	0.10
Barium	mg/L	0.001	0.055	0.090	0.023	0.061	0.137
Boron	mg/L	0.005	0.012	0.546	0.014	0.437	0.434
Calcium	mg/L	0.02	86.3	135	77.3	180	392
Iron	mg/L	0.005	<0.005	<0.005	<0.005	0.624	2.54
Magnesium	mg/L	0.02	9.67	14.3	3.35	36.5	27.8
Manganese	mg/L	0.001	<0.001	0.130	<0.001	0.307	8.22
Potassium	mg/L	0.1	2.1	2.5	1.9	4.4	19.8

Michelle Dubien Data Specialist

#### **CADUCEON Environmental Laboratories Certificate of Analysis**

	Client I.D.		MW 08-7S	MW 08-7D	MW 08-6	BH 1	BH 4
	Sam	ple I.D.	24-035410-1	24-035410-2	24-035410-3	24-035410-4	24-035410-5
	Date Co	llected	2024-11-11	2024-11-11	2024-11-11	2024-11-11	2024-11-11
Parameter	Units	R.L.	-	-	-	-	-
Silicon	mg/L	0.01	4.52	4.18	3.50	10.8	7.25
Sodium	mg/L	0.2	37.0	31.9	2.2	47.9	97.5
Strontium	mg/L	0.001	0.157	0.288	0.361	0.489	1.03
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cadmium	mg/L	0.00001 5	<0.000015	0.000026	<0.000015	0.000021	<0.000015
Chromium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001	0.0001	0.0009	0.0006	0.0070	0.0079
Copper	mg/L	0.0001	0.0022	0.0029	0.0059	0.0026	0.0022
pH (Client Data)	pH units	-	7.8	7.1	7.9	7.0	7.6
Temperature (Client Data)	°C	-	10.9	8.6	9.5	11.3	10.9

Michelle Dubien Data Specialist 

	Cli	ent I.D.	BH 2
	Sam Date Co	ple I.D. bllected	24-035410-6 2024-11-11
Parameter	Units	R.L.	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	214
Conductivity @25°C	uS/cm	1	446
рН @25°С	pH units	-	7.91
Chloride	mg/L	0.5	0.8
Nitrate (N)	mg/L	0.05	0.14
Sulphate	mg/L	1	14
Phosphorus (Total)	mg/L	0.01	0.02
Total Kjeldahl Nitrogen	mg/L	0.1	<0.1
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.09
Dissolved Organic Carbon	mg/L	0.8	2.2
Phenolics	mg/L	0.001	<0.001
COD	mg/L	5	<5
Hardness (as CaCO3)	mg/L	0.02	258
Aluminum	mg/L	0.01	0.04
Barium	mg/L	0.001	0.018
Boron	mg/L	0.005	0.009
Calcium	mg/L	0.02	98.6
Iron	mg/L	0.005	<0.005
Magnesium	mg/L	0.02	2.93
Manganese	mg/L	0.001	<0.001
Potassium	mg/L	0.1	3.2

Michelle Dubien Data Specialist

	Clie	ent I.D.	BH 2
	Sam	ple I.D.	24-035410-6
	Date Co	llected	2024-11-11
Parameter	Units	R.L.	-
Silicon	mg/L	0.01	6.22
Sodium	mg/L	0.2	2.8
Strontium	mg/L	0.001	0.183
Zinc	mg/L	0.005	<0.005
Cadmium	mg/L	0.00001 5	<0.000015
Chromium	mg/L	0.001	<0.001
Cobalt	mg/L	0.0001	0.0002
Copper	mg/L	0.0001	0.0014
pH (Client Data)	pH units	-	7.6
Temperature (Client Data)	°C	-	10.5

**CERTIFICATE OF ANALYSIS** 

C A D U C E C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C E C

#### C.O.C.: G 111484

#### **Report To:**

Jp2g Consultants Inc 1150 Morrison Dr. Ottawa, ON K2H 8S9

#### Attention: Nick Weston

DATE RECEIVED:

#### DATE REPORTED: 2024-Apr-25 Surface Water SAMPLE MATRIX: Qty Authorized Lab Method Reference Method Analyses Site Analyzed Date Analyzed Anions (Liquid) 3 OTTAWA LMACGREGOR 2024-Apr-17 A-IC-01 SM 4110B BOD5 (Liquid) 3 KINGSTON JWOLFE2 2024-Apr-19 SM 5210B BOD-001 COD (Liquid) 3 KINGSTON EHINCH 2024-Apr-19 COD-001 SM 5220D Cond/pH/Alk Auto (Liquid) 3 OTTAWA SBOUDREAU 2024-Apr-18 COND-02/PH-02/A SM 2510B/4500H/ LK-02 2320B DOC/DIC (Liquid) 3 OTTAWA VKASYAN 2024-Apr-19 C-OC-01 EPA 415.2 3 CP-028 Ion Balance (Calc.) OTTAWA STAILLON **MECP E3196** ICP/MS Total (Liquid) 3 OTTAWA TPRICE 2024-Apr-17 EPA 6020 D-ICPMS-01 ICP/OES Total (Liquid) 3 SM 3120B OTTAWA APRUDYVUS 2024-Apr-17 D-ICP-01 Ammonia & o-Phosphate (Liquid) 3 KINGSTON **JYEARWOOD** 2024-Apr-23 NH3-001 SM 4500NH3 Phenols (Liquid) 3 2024-Apr-22 **MECP E3179** KINGSTON **JMACINNES** PHEN-01 TP & TKN (Liquid) 3 KINGSTON **KDIBBITS** 2024-Apr-22 TPTKN-001 MECP E3516.2 TSS (Liquid) 3 KINGSTON **MCLOSS** 2024-Apr-23 TSS-001 SM 2540D

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *

2024-Apr-16

Michelle Dubien Data Specialist

**Final Report** 

REPORT No: 24-010391 - Rev. 0

## CADUCEON Environmental Laboratories 2378 Holly Lane

Ottawa, ON K1V 7P1

CUSTOMER PROJECT: Black & Donald WDS P.O. NUMBER:

	CI	ient I.D.	SW5	SW4	Dup #1
	Sam	ple I.D.	24-010391-1	24-010391-2	24-010391-3
	Date Co	ollected	2024-04-15	2024-04-15	2024-04-15
Parameter	Units	R.L.	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	118	175	117
Chloride	mg/L	0.5	8.0	36.0	7.8
Nitrate (N)	mg/L	0.05	<0.05	<0.05	<0.05
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	7	9	7
BOD5	mg/L	3	<3	<3	<3
Total Suspended Solids	mg/L	3	<3	<3	3
Phosphorus (Total)	mg/L	0.01	0.02	0.02	0.02
Total Kjeldahl Nitrogen	mg/L	0.1	0.3	0.2	0.3
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	<0.05	<0.05	<0.05
Dissolved Organic Carbon	mg/L	0.2	11.3	9.8	12.1
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001
COD	mg/L	5	20	14	21
Hardness (as CaCO3)	mg/L	-	111	167	120
Aluminum (Total)	mg/L	0.01	0.01	0.01	0.02
Barium (Total)	mg/L	0.001	0.026	0.036	0.029
Boron (Total)	mg/L	0.005	0.016	<0.005	0.016
Calcium (Total)	mg/L	0.02	35.6	55.5	38.7
Iron (Total)	mg/L	0.005	0.032	0.021	0.043
Magnesium (Total)	mg/L	0.02	5.27	6.95	5.59
Manganese (Total)	mg/L	0.001	0.003	0.008	0.002

	Cli	ent I.D.	SW5	SW4	Dup #1	
Parameter	Sam Date Co Units	ple I.D. Ilected R.L.	24-010391-1 2024-04-15 -	24-010391-2 2024-04-15 -	24-010391-3 2024-04-15	
Potassium (Total)	mg/L	0.1	1.1	1.6	1.1	
Silicon (Total)	mg/L	0.01	3.37	3.20	3.57	
Silica (Total)	mg/L	0.02	7.22	6.85	7.64	
Sodium (Total)	mg/L	0.2	4.6	25.5	4.9	
Strontium (Total)	mg/L	0.001	0.070	0.108	0.074	
Zinc (Total)	mg/L	0.005	<0.005	0.006	0.006	
Cadmium (Total)	mg/L	0.00001	<0.000015	<0.000015	<0.000015	
Chromium (Total)	mg/L	0.001	<0.001	<0.001	<0.001	
Cobalt (Total)	mg/L	0.0001	<0.0001	0.0001	0.0001	
Copper (Total)	mg/L	0.0001	0.0005	0.0008	0.0005	
Anion Sum	meq/L	-	2.72	4.70	2.70	
Cation Sum	meq/L	-	2.44	4.49	2.64	
% Difference	%	-	5.51	2.25	1.26	
Ion Ratio	-	-	1.12	1.05	1.03	
Sodium Adsorption Ratio	-	-	0.189	0.856	0.194	
TDS (Ion Sum Calc)	mg/L	1	132	240	135	
TDS(calc.)/EC(actual)	-	-	0.517	0.531	0.537	
Conductivity Calc	µmho/cm	-	251	451	260	
Conductivity Calc / Conductivity	-	-	0.984	1.00	1.03	
Langelier Index(25°C)	-	-	-0.0197	0.695	0.0747	
Saturation pH (25°C)	-	-	7.76	7.44	7.74	

#### **CADUCEON Environmental Laboratories Certificate of Analysis**

	Client I.D.			SW4	Dup #1
	Sample I.D.			24-010391-2	24-010391-3
	Date Co	llected	2024-04-15	2024-04-15	2024-04-15
Parameter	Units	R.L.	-	-	-
pH (Client Data)	pH units	-	5.5	5.6	
Temperature (Client Data)	°C	-	6.0	6.0	

Michelle Dubien Data Specialist

**CERTIFICATE OF ANALYSIS** 

C A D U C E ENVIRONMENTAL LABORATORIES Client committed. Quality assured. Canadian owned.

#### C.O.C.: G111365

#### **Report To:**

Jp2g Consultants Inc 1150 Morrison Dr. Ottawa, ON K2H 8S9

#### Attention: Nick Weston

DATE RECEIVED: DATE REPORTED:

## CADUCEON Environmental Laboratories

2378 Holly Lane Ottawa, ON K1V 7P1

CUSTOMER PROJECT: Black Donald 22-6213C P.O. NUMBER:

SAMPLE MATRIX:	Surface Water						
Analyses		Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)		3	OTTAWA	LMACGREGOR	2024-Aug-02	A-IC-01	SM 4110B
BOD5 (Liquid)		3	KINGSTON	JWOLFE2	2024-Aug-02	BOD-001	SM 5210B
COD (Liquid)		3	KINGSTON	EHINCH	2024-Aug-02	COD-001	SM 5220D
Cond/pH/Alk Auto (Liquid)		3	OTTAWA	SBOUDREAU	2024-Aug-01	COND-02/PH-02/A	SM 2510B/4500H/
						LK-02	2320B
DOC/DIC (Liquid)		3	OTTAWA	MMACMILLAN	2024-Aug-06	C-OC-01	EPA 415.2
Ion Balance (Calc.)		3	OTTAWA	ASCHNEIDER		CP-028	MECP E3196
ICP/MS Total (Liquid)		3	OTTAWA	AOZKAYMAK	2024-Aug-01	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)		3	OTTAWA	NHOGAN	2024-Aug-01	D-ICP-01	SM 3120B
Ammonia & o-Phosphate (	(Liquid)	3	KINGSTON	JYEARWOOD	2024-Aug-07	NH3-001	SM 4500NH3
Phenols (Liquid)		3	KINGSTON	JMACINNES	2024-Aug-02	PHEN-01	MECP E3179
TP & TKN (Liquid)		3	KINGSTON	YLIEN	2024-Aug-09	TPTKN-001	MECP E3516.2
TSS (Liquid)		3	KINGSTON	DCASSIDY	2024-Aug-02	TSS-001	SM 2540D

R.L. = Reporting Limit NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *

2024-Jul-31

2024-Aug-12

Michelle Dubien Data Specialist

### **Final Report**

REPORT No: 24-023373 - Rev. 0

	Cli	ent I.D.	SW5	SW4	Dup #1
	Sam	ple I.D.	24-023373-1	24-023373-2	24-023373-3
	Date Co	llected	2024-07-30	2024-07-30	2024-07-30
Parameter	Units	R.L.	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	195	250	188
Conductivity @25°C	uS/cm	1	378	677	381
pH @25°C	pH units	-	7.27	7.50	7.45
Chloride	mg/L	0.5	6.9	60.1	6.7
Nitrate (N)	mg/L	0.05	<0.05	<0.05	<0.05
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	2	<1	2
BOD5	mg/L	3	<3	<3	<3
Total Suspended Solids	mg/L	3	<3	4	<3
Phosphorus (Total)	mg/L	0.01	0.01	0.04	<0.01
Total Kjeldahl Nitrogen	mg/L	0.1	0.6	0.6	0.6
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	<0.05	<0.05	<0.05
Dissolved Organic Carbon	mg/L	0.2	14.3	11.0	12.6
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001
COD	mg/L	5	30	25	34
Hardness (as CaCO3)	mg/L	0.02	189	257	194
Aluminum (Total)	mg/L	0.01	0.02	0.03	0.02
Barium (Total)	mg/L	0.001	0.060	0.076	0.062
Boron (Total)	mg/L	0.005	0.023	<0.005	0.024
Calcium (Total)	mg/L	0.02	61.7	86.2	63.3
Iron (Total)	mg/L	0.005	0.292	0.312	0.298

	Cli	ent I.D.	SW5	SW4	Dup #1	
	Sam	ple I.D.	24-023373-1	24-023373-2	24-023373-3	
	Date Co	ollected	2024-07-30	2024-07-30	2024-07-30	
Parameter	Units	R.L.	-	-	-	
Magnesium (Total)	mg/L	0.02	8.51	10.0	8.70	
Manganese (Total)	mg/L	0.001	0.078	0.165	0.049	
Potassium (Total)	mg/L	0.1	0.9	2.4	0.9	
Silicon (Total)	mg/L	0.01	6.62	5.36	6.73	
Sodium (Total)	mg/L	0.2	6.1	40.2	6.2	
Strontium (Total)	mg/L	0.001	0.129	0.178	0.132	
Zinc (Total)	mg/L	0.005	0.009	0.010	0.012	
Cadmium (Total)	mg/L	0.00001 5	<0.000015	<0.000015	<0.000015	
Chromium (Total)	mg/L	0.001	<0.001	<0.001	<0.001	
Cobalt (Total)	mg/L	0.0001	0.0001	0.0005	0.0001	
Copper (Total)	mg/L	0.0001	0.0003	0.0005	0.0003	
Anion Sum	meq/L	-	4.14	6.71	3.99	
Cation Sum	meq/L	-	4.09	6.96	4.19	
% Difference	%	-	0.614	1.86	2.35	
Ion Ratio	-	-	1.01	0.963	0.954	
Sodium Adsorption Ratio	-	-	0.192	1.09	0.192	
TDS (Ion Sum Calc)	mg/L	1	204	350	201	
TDS(calc.)/EC(actual)	-	-	0.539	0.517	0.528	
Conductivity Calc	µmho/cm	-	384	658	383	
Conductivity Calc / Conductivity	-	-	1.02	0.972	1.01	
Langelier Index(25°C)	-	-	-0.0813	0.381	0.0934	

	Client I.D.			SW4	Dup #1
	Sam	ple I.D.	24-023373-1	24-023373-2	24-023373-3
	Date Collected		2024-07-30	2024-07-30	2024-07-30
Parameter	Units	R.L.	-	-	-
Saturation pH (25°C)	-	-	7.35	7.12	7.36
pH (Client Data)	pH units	-	6.9	7.3	
Temperature (Client Data)	°C	-	22.2	18.4	

**CERTIFICATE OF ANALYSIS** 

C A D U C E ENVIRONMENTAL LABORATORIES Client committed. Quality assured. Canadian owned.

#### C.O.C.: G 111441

#### **Report To:**

Jp2g Consultants Inc 1150 Morrison Dr. Ottawa, ON K2H 8S9

#### Attention: Nick Weston

DATE RECEIVED: DATE REPORTED:

## CADUCEON Environmental Laboratories 2378 Holly Lane

Ottawa, ON K1V 7P1

CUSTOMER PROJECT: 22-6213C Black Donald P.O. NUMBER:

SAMPLE MATRIX: Surface	Water					
Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	2	OTTAWA	LMACGREGOR	2024-Nov-13	A-IC-01	SM 4110B
BOD5 (Liquid)	2	KINGSTON	JWOLFE2	2024-Nov-14	BOD-001	SM 5210B
COD (Liquid)	2	KINGSTON	DCASSIDY	2024-Nov-15	COD-001	SM 5220D
Cond/pH/Alk Auto (Liquid)	2	OTTAWA	SBOUDREAU	2024-Nov-13	COND-02/PH-02/A	SM 2510B/4500H/
					LK-02	2320B
DOC/DIC (Liquid)	2	OTTAWA	TPRICE	2024-Nov-19	C-OC-01	EPA 415.2
ICP/MS Total (Liquid)	2	OTTAWA	AOZKAYMAK	2024-Nov-13	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	2	OTTAWA	APRUDYVUS	2024-Nov-14	D-ICP-01	SM 3120B
Ammonia & o-Phosphate (Liquid)	2	KINGSTON	JYEARWOOD	2024-Nov-19	NH3-001	SM 4500NH3
Phenols (Liquid)	2	KINGSTON	EHINCH	2024-Nov-14	PHEN-01	MECP E3179
TP & TKN (Liquid)	2	KINGSTON	YLIEN	2024-Nov-19	TPTKN-001	MECP E3516.2
TSS (Liquid)	2	KINGSTON	MCLOSS	2024-Nov-18	TSS-001	SM 2540D
B1 B // 11 N						

R.L. = Reporting Limit NC = Not Calculated

NC - NOL Calculated

Test methods may be modified from specified reference method unless indicated by an  $\,^{\star}$ 

2024-Nov-12

2024-Nov-21

Michelle Dubien Data Specialist

## **Final Report**

REPORT No: 24-035411 - Rev. 0

	SW5	Dup #1		
Parameter	Sam Date Co Units	ple I.D. Ilected R.L.	24-035411-1 2024-11-11 -	24-035411-2 2024-11-11 -
Alkalinity(CaCO3) to pH4.5	mg/L	5	171	171
Conductivity @25°C	uS/cm	1	364	366
рН @25°С	pH units	-	7.99	8.00
Chloride	mg/L	0.5	9.4	9.4
Nitrate (N)	mg/L	0.05	0.11	0.07
Nitrite (N)	mg/L	0.05	<0.05	<0.05
Sulphate	mg/L	1	3	3
BOD5	mg/L	3	<3	<3
Total Suspended Solids	mg/L	3	8	<3
Phosphorus (Total)	mg/L	0.01	0.04	0.04
Total Kjeldahl Nitrogen	mg/L	0.1	0.4	0.5
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	<0.05	<0.05
Dissolved Organic Carbon	mg/L	0.8	11.1	10.3
Phenolics	mg/L	0.001	<0.001	<0.001
COD	mg/L	5	15	18
Hardness (as CaCO3)	mg/L	0.02	182	189
Aluminum (Total)	mg/L	0.01	0.02	0.02
Barium (Total)	mg/L	0.001	0.048	0.049
Boron (Total)	mg/L	0.005	0.015	0.014
Calcium (Total)	mg/L	0.02	59.4	61.7
Iron (Total)	mg/L	0.005	0.226	0.234

	Cli	ent I.D.	SW5	Dup #1
	Sam	ple I.D.	24-035411-1	24-035411-2
	Date Co	llected	2024-11-11	2024-11-11
Parameter	Units	R.L.	-	-
Magnesium (Total)	mg/L	0.02	8.17	8.51
Manganese (Total)	mg/L	0.001	0.033	0.034
Potassium (Total)	mg/L	0.1	1.3	1.3
Silicon (Total)	mg/L	0.01	4.79	4.97
Sodium (Total)	mg/L	0.2	5.1	5.3
Strontium (Total)	mg/L	0.001	0.115	0.120
Zinc (Total)	mg/L	0.005	<0.005	<0.005
Cadmium (Total)	mg/L	0.00001 5	<0.000015	<0.000015
Chromium (Total)	mg/L	0.001	<0.001	<0.001
Cobalt (Total)	mg/L	0.0001	0.0002	0.0002
Copper (Total)	mg/L	0.0001	0.0003	0.0003
pH (Client Data)	pH units	-	7.6	
Temperature (Client Data)	°C	-	6.6	

## Appendix I Chemistry Analysais 2023

Monitor Number->	00%5	Background Median	RUC		BH 1				
	0DW3		Callow	Jun-23	Nov-23	Apr-24	Nov-24		
Parameters mg/L									
Alkalinity(CaCO3) to pH4.5	30-500	226	363	503	509	359	559		
pH @25°C	6.5 - 8.5			7.71			7.72		
Conductivity @25°C				969			1060		
Chloride	250	0.8	125	18.1	13.8	3.8	5		
Nitrate (N)	10	0.11	2.6	0.38	0.29	0.17	0.91		
Nitrite (N)	1		0.25	<0.05		<0.05			
Sulphate	500	14.00	257	26	24	11	15		
Phosphorus (Total)		0.03		0.03	0.02	0.04	0.04		
Total Kjeldahl Nitrogen		0.20		2.1	1.9	0.6	1.3		
Ammonia (N)-Total (NH3+NH4)		0.08		2.1	1.46	0.44	1.27		
Dissolved Organic Carbon	5	2.60	3.6	8	11.7	5.8	8		
Phenolics		0.002		<0.001	< 0.001	<0.001	<0.001		
COD				20	24	10	22		
Hardness (as CaCO3)	500	209	355	394	510	281	600		
Aluminum	0.1	0.03	0.065	0.06	0.06	0.02	0.05		
Barium	1	0.02	0.3	0.055	0.099	0.021	0.061		
Boron	5	0.01	1.26	0.655	0.715	0.136	0.437		
Calcium		79		121	163	/9.9	180		
Iron	0.3	0.01	0.16	< 0.005	3.6	0.194	0.624		
Magnesium	0.05	2.78	0.02	22.3	24.9	19.8	36.5		
Manganese	0.05	0.001	0.03	0.52	0.866	0.074	0.307		
Potassium		2.4		5.1	7.6	1.8	4.4		
Silicon	200	4.38	101	9.55	9.83	9.06	10.8		
Strontium	200	2.8	101	0.252	51.5	30.9	47.9		
Zinc	F	0.20	25	0.552	0.41	0.205	0.469		
	0.01	0.005	2.5	0.003	<0.005	<0.005	<0.005		
Cadmium	0.01	0.000015	0.003	<0.0002	<0.000015	<0.000015	0.000021		
Chromium	0.005	0.000013	0.0013	<0.000013	<0.00013	<0.000013	<0.000021		
Cobalt	0.050	0.001	0.015	0.001	0.001	0.001	0.001		
Copper	1	0.002	0.5	0.0023	0.0016	0.0024	0.0076		
Lead	0.010	0.002	010	0.00004	0.0010	0.0020	0.0020		
Mercury	0.010			<0.00004					
Anion Sum	0.001			11.1	11.1	7.53			
Cation Sum				10.4	12.9	7.03			
% Difference				3.48	7.4	3.46			
lon Ratio				1.07	0.862	1.07			
Sodium Adsorption Ratio				1.11	0.993	0.803			
TDS (Ion Sum Calc)	500	231	366	549	596	364			
TDS(calc.)/EC(actual)				0.567	0.603	0.545			
Conductivity Calc				935	1030	641			
Conductivity Calc / Conductivity				0.965	1.04	0.96			
Langelier Index(25°C)				1.02	1.3	0.965			
Saturation pH (25°C)				6.69	6.55	6.99			
Benzene				<0.5					
Dichlorobenzene,1,4-				<0.5					
Dichloromethane				<5					
Toluene				<0.5					
Vinyl Chloride				<0.2					
Field Measured									
Water Temp. (°C)				11.2	9.7	9.0	11.3		
Conductivity (microS/cm)				800	1090	740	1140		
pH (pH units)	6.5-8.5			6.2	7.4	6.3	7.00		

Notes:

All values reported in mg/L unless otherwise noted

ODWS = Ontario Drinking Water Standards

Values exceed ODWS

Monitor Number->	001//5	Background Median	RUC Background		ВН 2					
	ODWS		Callow	Jun-23	Nov-23	Apr-24	Nov-24			
Parameters mg/L										
Alkalinity(CaCO3) to pH4.5	30-500	226	363	244	228	228	214			
pH @25°C	6.5 - 8.5			7.81			7.91			
Conductivity @25°C				456			446			
Chloride	250	0.8	125	0.7	0.7	1.8	0.8			
Nitrate (N)	10	0.11	2.6	<0.05	0.11	<0.05	0.14			
Nitrite (N)	1		0.25	<0.05		<0.05				
Sulphate	500	14.00	257	12	16	13	14			
Phosphorus (Total)		0.03		0.04	0.02	0.03	0.02			
Total Kjeldahl Nitrogen		0.20		0.2	0.2	0.2	<0.1			
Ammonia (N)-Total (NH3+NH4)		0.08		<0.05	<0.05	<0.05	0.09			
Dissolved Organic Carbon	5	2.60	3.6	0.8	2.6	2.8	2.2			
Phenolics		0.002		< 0.001	< 0.001	< 0.001	<0.001			
COD				6	<5	22	<5			
Hardness (as CaCO3)	500	209	355	227	235	216	258			
Aluminum	0.1	0.03	0.065	0.05	0.03	0.02	0.04			
Barium	1	0.02	0.3	0.031	0.02	0.015	0.018			
Boron	5	0.01	1.26	0.009	0.006	0.007	0.009			
Calcium		79		86.5	89.6	81.8	98.6			
Iron	0.3	0.01	0.16	0.015	< 0.005	0.007	<0.005			
Magnesium		2.78		2.66	2.68	2.76	2.93			
Manganese	0.05	0.001	0.03	<0.001	< 0.001	<0.001	<0.001			
Potassium		2.4		2.7	2.7	2.8	3.2			
Silicon		4.38		5.7	6.01	6.02	6.22			
Sodium	200	2.8	101	2.3	2.8	2.6	2.8			
Strontium		0.26		0.175	0.165	0.174	0.183			
Zinc	5	0.005	2.5	0.005	< 0.005	<0.005	<0.005			
Arsenic	0.01		0.005	0.0001						
Cadmium	0.005	0.000015	0.0013	<0.000015	< 0.000015	<0.000015	<0.000015			
Chromium	0.050	0.001	0.013	< 0.001	< 0.001	< 0.001	< 0.001			
Cobalt		0.0004		0.0003	0.0002	0.0002	0.0002			
Copper	1	0.002	0.5	0.0038	0.0012	0.0013	0.0014			
Lead	0.010			0.00011						
Mercury	0.001			< 0.00002						
Anion Sum				5.13	4.92	4.89				
Cation Sum				4.71	4.88	4.5				
% Difference				4.26	0.386	4.15				
Ion Ratio				1.09	1.01	1.09				
Sodium Adsorption Ratio				0.0676	0.0781	0.0781				
TDS (Ion Sum Calc)	500	231	366	253	252	242				
TDS(calc.)/EC(actual)				0.554	0.554	0.529				
Conductivity Calc				455	459	438				
Conductivity Calc / Conductivity				0.999	1.01	0.956				
Langelier Index(25°C)				0.701	0.998	0.839				
Saturation pH (25°C)				7.11	7.12	7.16				
Benzene				<0.5						
Dichlorobenzene,1,4-				<0.5						
Dichloromethane				<5						
Toluene				<0.5						
Vinyl Chloride				<0.2						
Field Measured										
Water Temp. (°C)				9.9	8.8	8.1	10.5			
Conductivity (microS/cm)				510	550	530	510			
pH (pH units)	6.5-8.5			7.5	7.8	6.9	7.6			

Notes:

All values reported in mg/L unless otherwise noted

ODWS = Ontario Drinking Water Standards

Values exceed ODWS

Monitor Number->	ODWS Background		RUC	ВН 3						
	ODWS	Median	Median	Callow	Jun-23	Nov-23	Apr-24	Nov-24		
Parameters mg/L				NS	NS	NS	NS			
Alkalinity(CaCO3) to pH4.5	30-500	226	363							
рН @25°С	6.5 - 8.5									
Conductivity @25°C										
Chloride	250	0.8	125							
Nitrate (N)	10	0.11	2.6							
Nitrite (N)	1		0.25							
Sulphate	500	14.00	257							
Phosphorus (Total)		0.03								
Total Kjeldahl Nitrogen		0.20								
Ammonia (N)-Total (NH3+NH4)		0.08								
Dissolved Organic Carbon	5	2.60	3.6							
Phenolics		0.002								
COD										
Hardness (as CaCO3)	500	209	355							
Aluminum	0.1	0.03	0.065							
Barium	1	0.02	0.3							
Boron	5	0.01	1.26							
Calcium		79								
Iron	0.3	0.01	0.16							
Magnesium		2.78								
Manganese	0.05	0.001	0.03							
Potassium		2.4								
Silicon		4.38								
Sodium	200	2.8	101							
Strontium		0.26								
Zinc	5	0.005	2.5							
Arsenic	0.01		0.005							
Cadmium	0.005	0.000015	0.0013							
Chromium	0.050	0.001	0.013							
Cobalt		0.0004								
Copper	1	0.002	0.5							
Lead	0.010									
Mercury	0.001									
Anion Sum										
Cation Sum										
% Difference										
Ion Ratio										
Sodium Adsorption Ratio										
TDS (Ion Sum Calc)	500	231	366							
TDS(calc.)/EC(actual)										
Conductivity Calc										
Conductivity Calc / Conductivity										
Langelier Index(25°C)										
Saturation pH (25°C)										
Benzene										
Dichlorobenzene, 1.4-										
Dichloromethane										
Toluene										
Vinyl Chloride										
Field Measured										
Water Temp $\binom{0}{2}$										
Conductivity (micros/cm)										
nH (nH units)	65-85									
pir (pir units)	0.5-0.5	1	1		1	1	1	1	1	

Notes:

All values reported in mg/L unless otherwise noted

ODWS = Ontario Drinking Water Standards

Values exceed ODWS

Monitor Number->	00.005	Background Median	Background		ВН 4				
	0003		Callow	Jun-23	Nov-23	Apr-24	Nov-24		
Parameters mg/L									
Alkalinity(CaCO3) to pH4.5	30-500	226	363	623	533	577	501		
pH @25°C	6.5 - 8.5			7.62			7.36		
Conductivity @25°C				1640			1990		
Chloride	250	0.8	125	45.5	20.2	12.1	6		
Nitrate (N)	10	0.11	2.6	0.47	0.06	0.5	<0.05		
Nitrite (N)	1		0.25	<0.05		<0.05			
Sulphate	500	14.00	257	295	228	352	675		
Phosphorus (Total)		0.03		0.03	0.02	0.08	0.05		
Total Kjeldahl Nitrogen		0.20		1.4	0.9	1.6	1		
Ammonia (N)-Total (NH3+NH4)		0.08		0.63	0.33	0.29	0.4		
Dissolved Organic Carbon	5	2.60	3.6	5.6	13.4	27.8	14.5		
Phenolics		0.002		<0.001	<0.001	<0.001	<0.001		
COD				70	42	92	37		
Hardness (as CaCO3)	500	209	355	794	756	799	1090		
Aluminum	0.1	0.03	0.065	0.11	0.08	0.11	0.1		
Barium	1	0.02	0.3	0.101	0.099	0.263	0.137		
Boron	5	0.01	1.26	2.11	0.862	0.782	0.434		
Calcium		79		277	273	276	392		
Iron	0.3	0.01	0.16	0.007	0.012	0.392	2.54		
Magnesium		2.78		24.7	17.8	26.2	27.8		
Manganese	0.05	0.001	0.03	0.532	1.06	30.2	8.22		
Potassium		2.4		11.1	8.2	14.7	19.8		
Silicon		4.38		6	5.71	7.66	7.25		
Sodium	200	2.8	101	48.3	25.60	96.10	97.50		
Strontium		0.26		0.686	0.616	0.843	1.03		
Zinc	5	0.005	2.5	<0.005	<0.005	<0.005	<0.005		
Arsenic	0.01		0.005	0.0008					
Cadmium	0.005	0.000015	0.0013	0.000042	0.00	<0.000015	<0.000015		
Chromium	0.050	0.001	0.013	<0.001	<0.001	<0.001	<0.001		
Cobalt		0.0004		0.0018	0.0013	0.0053	0.0079		
Copper	1	0.002	0.5	0.0045	0.0047	0.0011	0.0022		
Lead	0.010			0.00004					
Mercury	0.001			<0.00002					
Anion Sum				20.1	16	19.2			
Cation Sum				18.3	16.5	21.6			
% Difference				4.83	1.53	5.86			
Ion Ratio				1.1	0.97	0.889			
Sodium Adsorption Ratio				0.746	0.405	1.48			
TDS (Ion Sum Calc)	500	231	366	1090	894	1160			
TDS(calc.)/EC(actual)				0.665	0.651	0.665			
Conductivity Calc				1610	1380	1620			
Conductivity Calc / Conductivity				0.982	1.01	0.934			
Langelier Index(25°C)				1.34	1.32	1.52			
Saturation pH (25°C)				6.28	6.33	6.31			
Benzene				<0.5					
Dichlorobenzene,1,4-				<0.5					
Dichloromethane				<5					
Toluene				<0.5					
Vinyl Chloride				<0.2					
Field Measured									
Water Temp. (°C)				10.2	9.6	8.9	10.9		
Conductivity (microS/cm)				1770	1480	1710	2230		
pH (pH units)	6.5-8.5			6.2	7.2	6.8	6.7		

Notes:

All values reported in mg/L unless otherwise noted

ODWS = Ontario Drinking Water Standards

Values exceed ODWS

Monitor Number->	0000/	Background	RUC			MW	-08-5		
	ODWS	Median	Median	Callow	Jun-23	Nov-23	Apr-24	Nov-24	
Parameters mg/L				NS	NS	NS	NS		
Alkalinity(CaCO3) to pH4.5	30-500	226	363						
pH @25°C	6.5 - 8.5								
Conductivity @25°C									
Chloride	250	0.8	125						
Nitrate (N)	10	0.11	2.6						
Nitrite (N)	1		0.25						
Sulphate	500	14.00	257						
Phosphorus (Total)		0.03							
Total Kjeldahl Nitrogen		0.20							
Ammonia (N)-Total (NH3+NH4)		0.08							
Dissolved Organic Carbon	5	2.60	3.6						
Phenolics		0.002							
COD									
Hardness (as CaCO3)	500	209	355						
Aluminum	0.1	0.03	0.065						
Barium	1	0.02	0.3						
Boron	5	0.01	1.26						
Calcium		79							
Iron	0.3	0.01	0.16						
Magnesium		2.78							
Manganese	0.05	0.001	0.03						
Potassium		2.4							
Silicon		4.38							
Sodium	200	2.8	101						
Strontium		0.26							
Zinc	5	0.005	2.5						
Arsenic	0.01		0.005						
Cadmium	0.005	0.000015	0.0013						
Chromium	0.050	0.001	0.013						
Cobalt		0.0004							
Copper	1	0.002	0.5						
Lead	0.010								
Mercury	0.001								
Anion Sum									
Cation Sum									
% Difference									
Ion Ratio									
Sodium Adsorption Ratio									
TDS (Ion Sum Calc)	500	231	366						
TDS(calc.)/EC(actual)									
Conductivity Calc									
Conductivity Calc / Conductivity									
Langelier Index(25°C)									
Saturation pH (25°C)									
Benzene									
Dichlorobenzene,1,4-									
Dichloromethane									
Toluene									
Vinyl Chloride									
Field Measured				ļ					
Water Temp. (°C)									
Conductivity (microS/cm)									
pH (pH units)	6.5-8.5								

Notes:

All values reported in mg/L unless otherwise noted

ODWS = Ontario Drinking Water Standards

Values exceed ODWS

Monitor Number->	00005	Background Median	RUC		MW 08-6					
	ODW3		Callow	Jun-23	Nov-23	Apr-24	Nov-24			
Parameters mg/L										
Alkalinity(CaCO3) to pH4.5	30-500	226	363	192	169	182	176			
pH @25°C	6.5 - 8.5			8.07			8.03			
Conductivity @25°C				364			362.00			
Chloride	250	0.8	125	0.8	<0.5	1.7	0.7			
Nitrate (N)	10	0.11	2.6	0.09	0.08	<0.05	<0.05			
Nitrite (N)	1		0.25	<0.05		<0.05				
Sulphate	500	14.00	257	12	8	10	8			
Phosphorus (Total)		0.03		< 0.01	< 0.01	0.03	0.02			
Total Kjeldahl Nitrogen		0.20		0.2	0.1	0.2	0.1			
Ammonia (N)-Total (NH3+NH4)		0.08		<0.05	<0.05	<0.05	0.08			
Dissolved Organic Carbon	5	2.60	3.6	2.1	4.4	4.9	3			
Phenolics		0.002		<0.001	< 0.001	<0.001	<0.001			
COD				6	<5	<5	<5			
Hardness (as CaCO3)	500	209	355	179	174	164	207			
Aluminum	0.1	0.03	0.065	0.05	0.02	0.07	0.02			
Barium	1	0.02	0.3	0.035	0.024	0.02	0.023			
Boron	5	0.01	1.26	0.01	< 0.005	0.009	0.014			
Calcium		79		67	65.3	60.7	77.3			
Iron	0.3	0.01	0.16	0.011	< 0.005	0.172	<0.005			
Magnesium		2.78		2.78	2.59	2.85	3.35			
Manganese	0.05	0.001	0.03	<0.001	0.001	0.002	< 0.001			
Potassium		2.4		2.1	1.6	2	1.9			
Silicon		4.38		3.37	3.14	3.57	3.5			
Sodium	200	2.8	101	2.1	1.7	2.1	2.2			
Strontium		0.26		0.299	0.258	0.288	0.361			
Zinc	5	0.005	2.5	<0.005	<0.005	<0.005	<0.005			
Arsenic	0.01		0.005	0.0002						
Cadmium	0.005	0.000015	0.0013	< 0.000015	< 0.000015	<0.000015	<0.000015			
Chromium	0.050	0.001	0.013	< 0.001	< 0.001	< 0.001	<0.001			
Cobalt		0.0004		0.0008	0.0005	0.0009	0.0006			
Copper	1	0.002	0.5	0.003	0.001	0.0016	0.0059			
Lead	0.010			0.00003						
Mercury	0.001			< 0.00002						
Anion Sum				4.11	3.56	3.9				
Cation Sum				3.73	3.59	3.42				
% Difference				4.91	0.43	6.56				
Ion Ratio				1.1	0.991	1.14				
Sodium Adsorption Ratio				0.0683	0.0561	0.0709				
TDS (Ion Sum Calc)	500	231	366	202	182	189				
TDS(calc.)/EC(actual)				0.555	0.54	0.537				
Conductivity Calc				368	339	345				
Conductivity Calc / Conductivity				1.01	1.01	0.977				
Langelier Index(25°C)				0.747	0.73	0.621				
Saturation pH (25°C)				7.32	7.37	7.38				
Benzene				<0.5						
Dichlorobenzene,1,4-				<0.5						
Dichloromethane				<5						
Toluene				<0.5						
Vinyl Chloride				<0.2						
Field Measured										
Water Temp. (°C)				11.0	7.6	8.8	9.5	[		
Conductivity (microS/cm)				420	410	420	420			
pH (pH units)	6.5-8.5			7.8	6.8	5.8	7.4			

Notes:

All values reported in mg/L unless otherwise noted

ODWS = Ontario Drinking Water Standards

Values exceed ODWS
#### Groundwater Quality Project Name: Black Donald

Monitor Number->	00.005	RUC MW 08-7S (Previously MW 08-7) Background					)8-7)		
	ODWS	Median	Callow	Jun-23	Nov-23	Apr-24	Nov-24		
Parameters mg/L									
Alkalinity(CaCO3) to pH4.5	30-500	226	363	176	203	202	225		
pH @25°C	6.5 - 8.5			7.97			8.11		
Conductivity @25°C				427			593		
Chloride	250	0.8	125	31	38.3	62.1	48.20		
Nitrate (N)	10	0.11	2.6	<0.05	0.07	<0.05	<0.05		
Nitrite (N)	1		0.25	<0.05		<0.05			
Sulphate	500	14.00	257	7	4	14	4		
Phosphorus (Total)		0.03			0.77	0.24	0.93		
Total Kjeldahl Nitrogen		0.20		0.1	0.2	0.2	0.20		
Ammonia (N)-Total (NH3+NH4)		0.08		<0.05	<0.05	<0.05	0.09		
Dissolved Organic Carbon	5	2.60	3.6	2	3.3	3.9	3.70		
Phenolics		0.002		< 0.001	< 0.001	<0.001	<0.001		
COD				18	10	<5	30		
Hardness (as CaCO3)	500	209	355	170	199	225	255.00		
Aluminum	0.1	0.03	0.065	0.04	0.02	0.02	0.03		
Barium	1	0.02	0.3	0.034	0.048	0.044	0.06		
Boron	5	0.01	1.26	<0.005	<0.005	0.013	0.01		
Calcium		79		57	67.9	74	86.30		
Iron	0.3	0.01	0.16	0.007	<0.005	0.011	<0.005		
Magnesium		2.78		6.61	7.12	9.6	9.67		
Manganese	0.05	0.001	0.03	< 0.001	< 0.001	< 0.001	< 0.001		
Potassium		2.4		1.2	1.4	1.6	2.10		
Silicon		4.38		3.16	3.72	3.72	4.52		
Sodium	200	2.8	101	20.9	26.1	25.3	37.00		
Strontium		0.26		0.102	0.113	0.151	0.16		
Zinc	5	0.005	2.5	<0.005	<0.005	<0.005	<0.005		
Arsenic	0.01		0.005	<0.0001					
Cadmium	0.005	0.000015	0.0013	<0.000015	<0.000015	<0.000015	<0.000015		
Chromium	0.050	0.001	0.013	<0.001	< 0.001	<0.001	<0.001		
Cobalt		0.0004		0.0001	0.0001	0.0001	0.00		
Copper	1	0.002	0.5	0.0012	0.0015	0.0015	0.00		
Lead	0.010			0.00002					
Mercury	0.001			<0.00002					
Anion Sum				4.54	5.22	6.09			
Cation Sum				4.33	5.15	5.63			
% Difference				2.34	0.722	3.94			
Ion Ratio				1.05	1.01	1.08			
Sodium Adsorption Ratio				0.698	0.805	0.734			
TDS (Ion Sum Calc)	500	231	366	229	267	308			
TDS(calc.)/EC(actual)				0.537	0.532	0.514			
Conductivity Calc				432	503	581			
Conductivity Calc / Conductivity				1.01	1	0.968			
Langelier Index(25°C)				0.54	0.916	0.693			
Saturation pH (25°C)				7.43	7.29	7.27			
Benzene				<0.5					
Dichlorobenzene,1,4-				<0.5					
Dichloromethane				<5					
Toluene				<0.5					
Vinyl Chloride				<0.2					
Field Measured									
Water Temp. (°C)				7.8	6.8	6.8	10.6		
Conductivity (microS/cm)				520	590	680	680		
pH (pH units)	6.5-8.5			6.3	8	6.7	7.8		

Notes:

All values reported in mg/L unless otherwise noted

ODWS = Ontario Drinking Water Standards

Values exceed ODWS

NS = No Sample

#### Groundwater Quality Project Name: Black Donald

Monitor Number->	00005	Background	RUC	RUC MW 23-7D (Well Installed Nov 2023) (MW08-7D)					
	ODWS	Median	Callow	Nov-23	Apr-24	DUP #1	Nov-24		
Parameters mg/L									
Alkalinity(CaCO3) to pH4.5	30-500	226	363	320	374	379	320		
рН @25°С	6.5 - 8.5						7.69		
Conductivity @25°C							802		
Chloride	250	0.8	125	37.1	22.7	22.8	45.7		
Nitrate (N)	10	0.11	2.6	0.12	0.14	0.13	<0.05		
Nitrite (N)	1		0.25		<0.05	<0.05			
Sulphate	500	14.00	257	23	21	21	27		
Phosphorus (Total)		0.03		5.19	3.76	2.82	2.11		
Total Kjeldahl Nitrogen		0.20		1.7	2.1	2.1	0.70		
Ammonia (N)-Total (NH3+NH4)		0.08		0.06	<0.05	<0.05	0.19		
Dissolved Organic Carbon	5	2.60	3.6	6.4	9.4	9.7	7.20		
Phenolics		0.002		<0.001	<0.001	<0.001	<0.001		
COD				130	70	69	69		
Hardness (as CaCO3)	500	209	355	336	369	370	397		
Aluminum	0.1	0.03	0.065	0.05	0.05	0.04	0.05		
Barium	1	0.02	0.3	0.094	0.076	0.077	0.09		
Boron	5	0.01	1.26	0.371	0.471	0.476	0.55		
Calcium		79		116	125	126	135		
Iron	0.3	0.01	0.16	0.005	<0.005	<0.005	<0.005		
Magnesium		2.78		11.2	13.6	13.6	14.3		
Manganese	0.05	0.001	0.03	0.009	0.015	0.017	0.13		
Potassium		2.4		1.8	1.9	1.9	2.50		
Silicon		4.38		3.74	4	3.96	4.18		
Sodium	200	2.8	101	24.7	17.5	17.4	17.4		
Strontium		0.26		0.248	0.303	0.306	0.29		
Zinc	5	0.005	2.5	<0.005	<0.005	<0.005	<0.005		
Arsenic	0.01		0.005						
Cadmium	0.005	0.000015	0.0013	<0.000015	<0.000015	<0.000015	0.000026		
Chromium	0.050	0.001	0.013	<0.001	< 0.001	<0.001	<0.001		
Cobalt		0.0004		0.0007	0.0007	0.0007	0.0009		
Copper	1	0.002	0.5	0.0021	0.0016	0.0015	0.0029		
Lead	0.010								
Mercury	0.001								
Anion Sum				7.94	8.54	8.65			
Cation Sum				7.84	8.18	8.2			
% Difference				0.64	2.18	2.69			
Ion Ratio				1.01	1.04	1.06			
Sodium Adsorption Ratio				0.586	0.396	0.394			
TDS (Ion Sum Calc)	500	231	366	407	426	430			
IDS(calc.)/EC(actual)				0.545	0.539	0.531			
				/32	/56	761			
Conductivity Calc / Conductivity				0.981	0.957	0.939			
Langelier Index(25°C)				1.06	1.1	0.975			
Saturation pH (25°C)				6.89	6.79	6.79			
Benzene									
Dichloromothana									
Vipul Chlorido									
				I					
Water Temp. (°C)				6.2	/.4	/.4	8.6		
Conductivity (microS/cm)				7.4	880	880	880		
pH (pH units)	6.5-8.5			8.4	7.4	7.4	7.1		

Notes:

All values reported in mg/L unless otherwise noted

ODWS = Ontario Drinking Water Standards

Values exceed ODWS

NS = No Sample

Monitor Number->	0014/5	Background	RUC	RUC BR 23-85			BR 23-8D			
	ODWS	Median	Callow	Nov-23	Apr-24	Nov-24	Nov-23	Apr-24	Nov-24	
Parameters mg/L				Dry	Dry	Dry	Dry	Dry	Dry	
Alkalinity(CaCO3) to pH4.5	30-500	226	363							
pH @25°C	6.5 - 8.5									
Conductivity @25°C										
Chloride	250	0.8	125							
Nitrate (N)	10	0.11	2.6							
Nitrite (N)	1		0.25							
Sulphate	500	14.00	257							
Phosphorus (Total)		0.03								
Total Kjeldahl Nitrogen		0.20								
Ammonia (N)-Total (NH3+NH4)		0.08								
Dissolved Organic Carbon	5	2.60	3.6							
Phenolics		0.002								
COD										
Hardness (as CaCO3)	500	209	355							
Aluminum	0.1	0.03	0.065							
Barium	1	0.02	0.3							
Boron	5	0.01	1.26							
Calcium		79								
Iron	0.3	0.01	0.16							
Magnesium		2.78								
Manganese	0.05	0.001	0.03							
Potassium		2.4								
Silicon		4.38								
Sodium	200	2.8	101							
Strontium		0.26								
Zinc	5	0.005	2.5							
Arsenic	0.01		0.005							
Cadmium	0.005	0.000015	0.0013							
Chromium	0.050	0.001	0.013							
Cobalt		0.0004								
Copper	1	0.002	0.5							
Lead	0.010									
Mercury	0.001									
Anion Sum										
Cation Sum										
% Difference										
lon Ratio										
Sodium Adsorption Ratio										
TDS (Ion Sum Calc)	500	231	366							
TDS(calc.)/EC(actual)										
Conductivity Calc										
Conductivity Calc / Conductivity										
Langelier Index(25°C)										
Saturation pH (25°C)										
Benzene	1			1						
Dichlorobenzene,1,4-										
Dichloromethane	1			1						
Toluene				1						
Vinyl Chloride										
Field Measured	1	1	İ							
Water Temp (°C)	1			1						
Conductivity (micros/cm)		+								
nH (nH units)	6505									
	0.5-0.5	1								1

Notes:

All values reported in mg/L unless otherwise noted

ODWS = Ontario Drinking Water Standards

Values exceed ODWS

NS = No Sample

Monitor Number ->	1	SW 4							
Parameters	Limit	PWQO	cwqg	Jun-23	Aug-23	Nov-23	Apr-24	Jul-24	Nov-24
Alkalinity(CaCO3) to pH4.5	IPWQO	а		222	DRY	DRY	175	250	DRY
pH @25°C				8.01					
Conductivity @25°C				554					
TDS (Calc. from Cond.)				287					
Chloride			120	49.6			36	60	
Nitrate (N)			3	0.11			<0.05	<0.05	
Nitrite (N)			0.6	<0.05			<0.05	<0.05	
Sulphate				<1			9	<1	
BOD5				<3			<3	<3	
Total Suspended Solids				4			<3	4	
Phosphorus (Total)	IPWQO	0.03		0.02			0.02	0.04	
Total Kjeldahl Nitrogen				0.4			0.2	0.6	
Ammonia (N)-Total (NH3+NH4)				<0.05			<0.05	<0.05	
Dissolved Organic Carbon							9.8	11	
Phenolics				<0.001			< 0.001	<0.001	
COD				17			14	25	
Hardness (as CaCO3)				232			167	257	
Aluminum (Total)							0.01	0.03	
Barium (Total)				0.062			0.036	0.076	
Boron (Total)	IPWQO	0.2	1.5	0.008			< 0.005	<0.005	
Calcium (Total)				79			55.5	86.2	
Iron (Total)	PWQO	0.3	0.3	0.239			0.021	0.312	
Magnesium (Total)				8.38			6.95	10	
Manganese (Total)							0.008	0.165	
Potassium (Total)							1.6	2.4	
Silicon (Total)							25.5	5.36	
Silica (Total)							3.2		
Sodium (Total)							6.85	40.2	
Strontium (Total)				0.158			0.108	0.178	
Zinc (Total)	PWQO IPWQO	0.03 0.02	0.007	0.005			0.006	0.01	
Arsenic (Total)				0.0002					
Cadmium (Total)	PWQO	0.0002	0.00009	<0.000015			<0.000015	<0.000015	
Chromium (Total)	PWQO	0.001	0.001	<0.001			< 0.001	<0.001	
Cobalt (Total)							0.0001	0.0005	
Copper (Total)	PWQO IPWQO	0.005 d	Max 0.004 min 0.002 (based on hardness)	0.0003			0.0008	0.0005	
Lead (Total)	PWQO	0.005	0.001	0.00004					
Mercury	PWQO	0.0002	0.000026	<0.00002					
Anion Sum				5.84			4.7	6.71	
Cation Sum				6.09			4.49	6.96	
% Difference				2.14			2.25	1.86	
Ion Ratio				0.958			1.05	0.963	
Sodium Adsorption Ratio				0.915			0.856	1.09	
TDS (Ion Sum Calc)				305			240	350	
TDS(calc.)/EC(actual)				0.551			0.531	0.517	
Conductivity Calc				578			451	658	
Conductivity Calc / Conductivity				1.04			1	0.972	
Langelier Index(25°C)				0.811			0.695	0.381	
Saturation pH (25°C)				7.2			7.44	7.12	
Field Measured									
Water Temp. (°C)				6.1			6	18.4	
Conductivity (microS/cm)				630			520	700	
pH (pH units)		6.5 - 8.5	6.5 - 9	7.4			5.6	7.3	
DO				5			7.2	2.2	
FLOW L/S				36			NA	NA	

Notes:

All values reported in mg/L unless otherwise noted PWQO- Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines Shaded values exceed PWQO

NS - No Sample Taken

#### Surface Water Quality

Project Name: Black Donald

Monitor Number ->					sv	V 5		
				Dup #1	50	Dup #1		Dup #1
Parameters	Limit	PWQO	Jun-23	Jun-23	Aug-23	Aug-23	Nov-23	Nov-23
Alkalinity(CaCO3) to pH4.5	IPWQO	а	188	192	251	248	187	180
pH @25°C			8.04	7.93				
Conductivity @25°C			355	360				
TDS (Calc. from Cond.)			183	185	255	259		
Chloride			5.7	5.7	9.7	9.6	11.2	10.9
Nitrate (N)			<0.05	0.08	0.06	0.08	0.05	0.06
Sulphate			1	1	<0.05	<0.05	<0.05 0	<0.05 0
BOD5			- 1	<3	<1	<1	3	
Total Suspended Solids			<3	3	11	10	6	<3
Phosphorus (Total)	IPWQO	0.03	0.01	0.01	0.04	0.09	0.02	0.02
Total Kjeldahl Nitrogen			0.5	0.5	0.7	0.8	0.5	0.5
Ammonia (N)-Total (NH3+NH4)			<0.05	<0.05	0.14	0.14	<0.05	<0.05
Dissolved Organic Carbon					16.7	16.7	11	10.6
Phenolics			<0.001	<0.001	<0.001	<0.001	0.001	0.002
COD			34	24	39	36	22	24
Hardness (as CaCO3)			173	187	258	244	195	184
Aluminum (Total)							0.04	0.05
Barium (Total)			0.053	0.057	0.082	0.078	0.051	0.049
Boron (Total)	IPWQO	0.2	0.021	0.022	0.018	0.017	0.014	0.014
Calcium (Total)	DWOO	0.2	58.3	63	85.4	80.9	63.4	60
Iron (Total)	PWQO	0.3	0.192	0.205	1.93	1.83	0.238	0.232
Manganese (Total)			0.01	7.18	10.9	10.20	0.92	0.00
Potassium (Total)					1 1	1.00	1.80	1.7
Silicon (Total)					1.1	1.00	1.00	1.7
Silica (Total)								
Sodium (Total)					6.4	6.00	6.40	6
Strontium (Total)			0.113	0.123	0.17	0.16	0.125	0.117
Zinc (Total)	PWQO IPWQO	0.03 0.02	0.005	0.006	<0.005	<0.005	0.009	0.006
Arsenic (Total)			0.0002	0.0002				
Cadmium (Total)	PWQO	0.0002	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015
Chromium (Total)	PWQO	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Total)	-							
Copper (Total)	PWQO IPWQO	0.005 d	0.0003	0.0003	0.0002	0.0002	0.0006	0.0005
Lead (Total)	PWQO	0.005	0.00004	0.00004				
Mercury	PWQO	0.0002	<0.00002	<0.00002				
Anion Sum			3.94	4.04	5.31	5.25	4.24	4.1
Cation Sum			3.67	3.97	5.58	5.28	4.24	4
% Difference			3.5	0.865	2.52	0.225	0.0941	1.24
Sodium Adsorption Patio			0.120	0.147	0.951	0.996	1 0.108	1.03
TDS (Ion Sum Calc)			190	199	267	260	213	205
TDS(calc.)/EC(actual)			0.535	0.553	0 542	0.52	0.54	0.518
Conductivity Calc			355	374	497	481	402	385
Conductivity Calc / Conductivity			1	1.04	1.01	0.962	1.02	0.975
Langelier Index(25°C)			0.656	0.591	0.368	0.39	0.461	0.461
Saturation pH (25°C)			7.38	7.34	7.1	7.13	7.36	7.4
Field Measured								
Water Temp. (°C)			19.5		17.5		3.2	
Conductivity (microS/cm)			420		580		470	
pH (pH units)		6.5 - 8.5	7.4		7.30		8.6	
DO			3.4		NA		8.1	
FLOW L/S			16.59		4.39		20.5	

Notes:

All values reported in mg/L unless otherwise noted PWQO- Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines Shaded values exceed PWQO

NS - No Sample Taken

#### Surface Water Quality

Project Name: Black Donald

Monitor Number ->					sv	V 5		
				Dup #1		Dup #1		Dup #1
Parameters	Limit	PWQO	Apr-24	Apr-24	Jul-24	Jul-24	Nov-24	Nov-24
Alkalinity(CaCO3) to pH4.5	IPWQO	а	118	117	195	188	171	171
pH @25°C							7.99	8
Conductivity @25°C							364	366
TDS (Calc. from Cond.)								
Chloride			8	7.8	6.9	6.7	9.4	9.4
Nitrate (N)			<0.05	<0.05	<0.05	<0.05	0.11	0.07
Sulphate			×0.05 7	×0.05 7	20.05	×0.05 2	20.05	<0.05 2
BOD5				/	<3	<3	3	
Total Suspended Solids			<3	3	<3	<3	8	<3
Phosphorus (Total)	IPWQO	0.03	0.02	0.02	0.01	<0.01	0.04	0.04
Total Kjeldahl Nitrogen			0.3	0.3	0.6	0.6	0.4	0.5
Ammonia (N)-Total (NH3+NH4)			< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dissolved Organic Carbon			11.3	12.1	14.3	12.6	11.1	10.3
Phenolics			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
COD			20	21	30	34	15	18
Hardness (as CaCO3)			111	120	189	194	182	189
Aluminum (Total)			0.01	0.02	0.02	0.02	0.02	0.02
Barium (Total)			0.026	0.029	0.06	0.062	0.048	0.049
Boron (Total)	IPWQO	0.2	0.016	0.016	0.023	0.024	0.015	0.014
Calcium (Total)	DWOO	0.2	35.6	38.7	61./	63.3	59.4	61./
Iron (Total)	PWQO	0.3	0.032	0.043	0.292	0.298	0.226	0.234
Magnesium (Total)			0.003	0.002	0.078	0.7	0.033	0.034
Potassium (Total)			1 10	1 10	0.078	0.049	1 30	1 3
Silicon (Total)			4 60	4 90	6.62	6.73	5.10	5.3
Silica (Total)			3.37	3.57	0.02	0.70	4.79	4.97
Sodium (Total)			7.22	7.64	6.10	6.2		
Strontium (Total)			0.07	0.074	0.129	0.132	0.115	0.12
Zinc (Total)	PWQO IPWQO	0.03 0.02	<0.005	0.006	0.009	0.012	<0.005	<0.005
Arsenic (Total)								
Cadmium (Total)	PWQO	0.0002	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015
Chromium (Total)	PWQO	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobait (Total)			<0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
Copper (Total)	PWQO IPWQO	0.005 d	0.0005	0.0005	0.0003	0.0003	0.0003	0.0003
Lead (Total)	PWQO	0.005						
Mercury	PWQO	0.0002						
Anion Sum			2.72	2.7	4.14	3.99		
Cation Sum			2.44	2.64	4.09	4.19		
% Difference			5.51	1.26	0.614	2.35		
Ion Ratio			1.12	1.03	1.01	0.954		
Sodium Adsorption Ratio			0.189	0.194	0.192	0.192		
TDS (ION SUM Calc)			0.517	135	204	201		
Conductivity Calc			251	260	38/	383		
Conductivity Calc / Conductivity			0.984	1.03	1.02	1.01		
Langelier Index(25°C)			-0.0197	0.0747	-0.0813	0.0934		
Saturation pH (25°C)			7.76	7.74	7.35	7.36		
Field Measured								
Water Temp. (°C)			6		22.2		6.6	
Conductivity (microS/cm)			600		460		420	
pH (pH units)		6.5 - 8.5	5.5		6.9		7.6	
DO			6.6		4.8		5.8	
FLOW L/S			195		3.77		11	

Notes:

All values reported in mg/L unless otherwise noted

PWQO- Provincial Water Quality Objectives

CWQG - Canadian Water Quality Guidelines Shaded values exceed PWQO

NS - No Sample Taken

# Appendix J Monitoring and Screening Checklist

# Appendix D-Monitoring and Screening Checklist General Information and Instructions

#### General Information: The checklist is to be completed, and submitted with the Monitoring Report.

Instructions: A complete checklist consists of:

(a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.

(b) completed contact information for the Competent Environmental Practitioner (CEP)

(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

#### Definition of Groundwater CEP:

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

(a) the person holds a licence, limited licence or temporary licence under the Professional Engineers Act; or

(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

#### **Definition of Surface water CEP:**

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

	Monitoring Report and Site Information						
Waste Disposal Site Name	Black Donald Landfill						
Location (e.g. street address, lot, concession)	Part of Lot 9, Concession 2 and 3, within the geographic Township of Brougham, Township of Greater Madawaska						
GPS Location (taken within the property boundary at front gate/ front entry)	NAD 83, UTM Zone 18, 353188E 5010581N						
Municipality	Township of Greater Madawaska						
Client and/or Site Owner	Township of Greater Madawaska						
Monitoring Period (Year)	2024						
This	Monitoring Report is being submitted under the following:						
Environmental Compliance Approval Number:	ECA # A411902						
Director's Order No.:	NA						
Provincial Officer's Order No.:	NA						
Other:	NA						

Report Submission Frequency	<ul><li>Annual</li><li>Other</li></ul>				
The site is: (Operation Status)		<ul> <li>Open</li> <li>Inactive</li> <li>Closed</li> </ul>			
Does your Site have a Total Approved Capacity?		<ul><li>Yes</li><li>No</li></ul>			
lf yes, please specify Total Approved Capacity	46,785	Units	Cubic Metres		
Does your Site have a Maximum Approved Fill Rate?		<ul><li>Yes</li><li>No</li></ul>			
lf yes, please specify Maximum Approved Fill Rate		Units	<b>_</b>		
Total Waste Received within Monitoring Period (Year)	0	Units	Cubic Metres		
<b>Total Waste Received</b> <b>within Monitoring Period (Year)</b> <i>Methodology</i>					
Estimated Remaining Capacity	2,718	Units	Cubic Metres		
<b>Estimated Remaining Capacity</b> <i>Methodology</i>	Direct Survey (GPS/Total Station)		1		
Estimated Remaining Capacity Date Last Determined	December 20 , 2023				
Non-Hazardous Approved Waste Types	<ul> <li>Domestic</li> <li>Industrial, Commercial &amp; Institutional (IC&amp;I)</li> <li>Source Separated Organics (Green Bin)</li> <li>Tires</li> </ul>	<ul> <li>Contaminated Soil</li> <li>Wood Waste</li> <li>Blue Box Material</li> <li>Processed Organics</li> <li>Leaf and Yard Waste</li> </ul>	<ul> <li>Food Processing/Preparation</li> <li>Operations Waste</li> <li>Hauled Sewage</li> <li>Construction and</li> <li>demolition and Bulky</li> <li>waste</li> </ul>		
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial (separate waste classes by comma)					
<b>Year Site Opened</b> (enter the Calendar Year <u>only</u> )	1960	Current ECA Issue Date	1980-03-27 amended 2013-01-24		
Is your Site required to submit Fina	ncial Assurance?	() (•)	Yes No		
Describe how your Landfill is desig	ned.	<ul> <li>Natural Attenuation only</li> <li>Fully engineered Facility</li> <li>Partially engineered Facility</li> </ul>			
Does your Site have an approved C	ontaminant Attenuation Zone?	() (•	Yes No		

If closed, specify C of A, control or authorizing document closure date:				
Has the nature of the operations at the site changed during this monitoring period?		○ Yes ⓒ No		
If yes, provide details:				
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 a	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							
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):	<ul> <li>Yes</li> <li>No</li> <li>Not Applicable</li> </ul>	If no, list exceptions below o	or attach information.					
Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)		Date					
ВНЗ	Observed to be destroyed since	fall 2021	April and November 2024					
MW08-5	Dry	April and November 2024						
MW23-85	Dry		April and November 2024					
MW23-8D	Dry		April and November 2024					

3) a) Is landfill gas being monitored or controlled at th	⊙ Yes ○ No		
If yes to 3(a), please answer the next two questions be	low.		
b) Have any measurements been taken since the la period that indicate landfill gas is present in the su levels exceeding criteria established for the site?	◯ Yes		
c) Has the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:		<ul> <li>Yes</li> <li>No</li> <li>Not Applicable</li> </ul>	If no, list exceptions below or attach additional information.
Groundwater Sampling Location (change in name or location, additions, deletions)			Date
All sampling completed in general conformance with Jp2g sampling procedures			
<ul> <li>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):</li> </ul>		All sampling completed in sampling procedures	general conformance with Jp2g

	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					
6)	The site meets compliance and assessment criteria.	● Yes ○ No	Compliant with Guideline I	3-7			
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					
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 O No	Note which practice(s):	□ (a) □ (b) ⊠ (c)			
9)	Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	<ul> <li>Yes</li> <li>No</li> <li>Not Applicable</li> </ul>					

# 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:

#### Select Date

### **Recommendations:**

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

No changes to the monitoring program are recommended	
The following change(s) to the	
<ul> <li>No Changes to site design and operation are recommended</li> </ul>	
The following change(s) to the	

Name:	Andrew Buzza, P.Geo		
Seal:	Add Image		
Signature:		Date:	March 2025
CEP Contact Information:	Andrew Buzza, P.Geo		
Company:	Jp2g Consultants Inc		
Address:	1150 Morrison Drive Suite 410		
Telephone No.:	613 828 7800	Fax No. :	613 828 2600
E-mail Address:	andrew.buzza@jp2g.com		
Co-signers for additional expertise provided:			
Signature:		Date:	
Signature:		Date:	

Surface Water WDS Verification:			
Provide the name of surface wate waterbody (including the nearest s	r body/bodies potentially recei urface water body/bodies to the	ving the WDS effluent an site):	d the approximate distance to the
Name (s)	Unnamed Creeks		
Distance(s)	Approximately 850 m northwest of the site		
Based on all available information a	and site knowledge, it is my opin	ion that:	
	Sampling and Monitori	ng Program Status	•
<ol> <li>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:</li> </ol>	● Yes ○ No		
<ol> <li>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):</li> </ol>	<ul> <li>Yes</li> <li>No</li> <li>Not applicable (No C of A, authorizing / control document applies)</li> </ul>	If no, specify below or provi	de details in an attachment.
Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)		Date
SW4	N4 Dry		November 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.		<ul> <li>○ Yes</li> <li>● No</li> <li>○ Not Applicable</li> </ul>	
b) If yes, all surface water sampl under 3 (a) was successfully com established program from the si protocols, frequencies, location developed per the Technical Gu	ing and monitoring identified ppleted in accordance with the ite, including sampling s and parameters) as idance Document:	<ul> <li>Yes</li> <li>No</li> <li>Not Applicable</li> </ul>	If no, specify below or provide details in an attachment.
Surface Water Sampling Location	Description/Explana (change in name or location	ntion for change n, additions, deletions)	Date
All sampling completed in general conformance with Jp2g sampling procedures			
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	All sampling completed in sampling procedures	general conformance with Jp2g

# 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,	∩ Yes
	regulations, Water Management Policies, Guidelines and Provincial Water Quality	
	Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or	● No
	Table B in the Technical Guidance Document (Section 4.6):	

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
Phosphorus	IPWQO 0.03	SW4 33.3% (July 2024) SW5 33.3% (November 2024)
Iron	PWQO 0.3	SW4 4% Iron (July 2024)
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	

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	
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)):	<ul> <li>Yes</li> <li>No</li> <li>Not Known</li> <li>Not Applicable</li> </ul>	Overall the results of the surface and groundwater sampling do not indicate that the past landfilling activities at this location is having a negative effect on the surface water around the Landfill site.
9	Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	<ul> <li>Yes</li> <li>No</li> <li>Not Applicable</li> </ul>	At SW5, no parameter concentrations were above PWQO or 75th percentile of background surface water quality except for: •In July: Chemical Oxygen Demand (COD) and total Kjeldahl nitrogen (TKN). •In November: Phosphorus. These exceedances did not trigger the implementation of the contingency plan.

# 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:

Select Date

Recommendations:				
Based on my technical review of the	monitoring results for the waste disposal site:			
No Changes to the monitoring program are recommended				
The following change(s) to the				
No changes to the site design and operation are recommended				
The following change(s) to the				

CEP Signature		
Relevant Discipline	Professional Geoscientist, education and over 30 years experi	ence
Date:	March 2025	
CEP Contact Information:	Andrew Buzza	
Company:	Jp2g Consultants Inc	
Address:	1150 Morrison Drive	
Telephone No.:	613 828 7800	
Fax No. :	613 828 2600	
E-mail Address:	andrew.buzza@jp2g.com	
Save As		Print Form