2025 Annual Monitoring Report
Hickey Road Waste Disposal Site
Environmental Compliance Approval No. A362301

Prepared for:
The Corporation of the Municipality of Hastings Highlands
P.O. Box 130
33011 Highway No. 62
Maynooth, ON K0L 2S0

Prepared by:
BluMetric Environmental Inc.
4 Cataraqui Street
The Woolen Mill, The Tower
Kingston, ON K7K 1Z7

Project Number: 250253-05
March 25, 2026

BluMetric.ca

Table of Contents

1 Introduction ____ 1

1.1 Location ____ 1
1.2 Site Ownership and Key Personnel ____ 2
1.3 Description and Development of the Site ____ 3
1.4 Monitoring and Reporting Program and Objectives and Requirements ____ 4

2 Physical Setting ____ 5

2.1 Geology and Hydrogeology ____ 5
2.1.1 Surficial Geology ____ 5
2.1.2 Overburden Hydrogeology ____ 5
2.1.3 Bedrock Geology ____ 5
2.1.4 Bedrock Hydrogeology ____ 5
2.2 Surface Water Features ____ 6
2.3 Potential Receptors ____ 6

3 Monitoring Program ____ 6

3.1 Site Inspections and Operational Monitoring ____ 6
3.2 Monitoring Locations, Frequency, and Monitoring Parameters ____ 7
3.2.1 Groundwater Monitoring ____ 7
3.2.2 Surface Water Monitoring ____ 9
3.2.3 Landfill Gas Monitoring ____ 11
3.3 Monitoring Procedures and Methods ____ 11
3.3.1 Groundwater Monitoring ____ 11
3.3.2 Surface Water Monitoring ____ 11
3.3.3 Landfill Gas Monitoring ____ 12
3.3.4 Field QA/QC Program ____ 12

4 Monitoring Results ____ 13

4.1 Groundwater Quality ____ 13
4.2 Surface Water Quality ____ 16
4.3 Landfill Gas Monitoring ____ 17
4.4 QA/QC Results ____ 17

5 Assessment, Interpretation, and Discussion ____ 18

5.1 Groundwater Assessment ____ 18
5.2 Surface Water Assessment ____ 24
5.3 Mann-Kendall Trend Analysis ____ 25
5.4 Landfill Gas Assessment ____ 28
5.5 Trigger Mechanisms and Contingency Plan ____ 28

6 On-Site Operations ____ 29

6.1 Annual Waste Summary ____ 29
6.1.1 Summary of Segregated Materials Removed ____ 30
6.2 Annual Complaints Summary ____ 30
6.3 Capacity ____ 30

7 Summary Statements, Conclusions, and Recommendations ____ 31

7.1 Site Operations ____ 31
7.2 Groundwater ____ 32
7.3 Surface Water ____ 33
7.4 Trigger Mechanisms and Contingency Plan ____ 33
7.5 Landfill Gas ____ 34
7.6 Landfill Capacity ____ 34

8 Limiting Conditions ____ 34

9 References ____ 36

List of Tables

Table 1: Contact Information _____ 2
Table 2: Groundwater Monitoring Well Details _____ 7
Table 3: Groundwater Quality Monitoring Parameters _____ 8
Table 4: Groundwater Elevation Data _____ 9
Table 5: Surface Water Monitoring Locations _____ 9
Table 6: Surface Water Quality Monitoring Parameters _____ 10
Table 7: Surface Water Sampling Observations _____ 10
Table 8: Groundwater Quality Field Measurements _____ 14
Table 9: Groundwater Quality Results Exceeding ODWSOG _____ 14
Table 10: Groundwater Quality Results Exceeding RUV Criteria _____ 15
Table 11: Groundwater Quality Results Exceeding PWQO _____ 16
Table 12: Surface Water Quality Results Exceeding Criteria _____ 17
Table 13: Annual Recycling and Waste Tonnages _____ 29
Table 14: 2025 Groundwater Chemistry Results _____ (end of text)
Table 15: 2025 Surface Water Chemistry Results _____ (end of text)

List of Figures

Figure 01: Site Location Map
Figure 02: Site Plan
Figure 03: Site Topography and Monitoring Locations
Figure 04: Monitoring Locations and Spring Water Levels
Figure 05: Monitoring Locations and Fall Water Levels
Figure 06: Remaining Fill Capacity as of June 2023

List of Appendices

(Provided on USB Drive for Hard Copy)

Appendix A: A-1 Amended Environmental Compliance Approval – July 2025
A-2 Environmental Compliance Approval – December 2018
A-3 MECP Groundwater Review Memo – June 2024
A-4 MECP Inspection Report – August 2025
A-5 MECP Inspection Correspondence – August 2025
Appendix B: Monitoring and Screening Checklist
Appendix C: Groundwater Monitoring Well Logs
Appendix D: Field Forms, Laboratory Reports, and Chain of Custody Records
D-1 Site Observation Forms
D-2 Groundwater Laboratory Reports
D-3 Surface Water Laboratory Reports
D-4 QAQC Calculations
Appendix E: Historical Groundwater and Surface Water Chemistry
E-1 Historical Groundwater Chemistry
E-2 Historical Surface Water Chemistry
E-3 2025 Surface Water Monitoring Locations Comparisons
Appendix F: Mann-Kendall Trend Analysis
Appendix G: Trigger Mechanisms and Contingency Plan
F-1 Surface Water Trigger Mechanisms and Contingency Plan
F-2 Draft Groundwater Trigger Mechanisms and Contingency Plan

1 Introduction

This report provides a summary and analysis of environmental monitoring activities at the Hickey Road Waste Disposal Site (WDS), in Maynooth, Ontario. The WDS as shown in Figure 01 is herein referred to as the "Site".

This report is being prepared for the Corporation of the Municipality of Hastings Highlands (the Municipality, or MHHs). The Municipality has been in the process of purchasing the Crown land from the Ministry of Natural Resources (MNR) for the past few years. In January of 2020, it was thought that ownership of the 4.0 hectares (ha) waste site had been transferred from the Crown to the Municipality, however as of March 2025, it remains in the final stages of documentation processing.

The Site previously operated under Environmental Compliance Approval (ECA) No. A362301, dated December 20, 2018 (**Appendix A-2**). As of July 19, 2025, the Site operates under the amended ECA, which was issued on July 19, 2025 (**Appendix A-1**). A site inspection by the Ontario Ministry of Environment, Conservation and Parks (MECP) was completed on July 9, 2025; findings from this inspection are summarized in Section 1.3.

This report covers all work and activities carried out for the period of January 1, 2025, to December 31, 2025. BluMetric Environmental Inc. (BluMetric®) was retained by the Municipality to conduct the 2025 environmental monitoring and sampling program and prepare the 2025 Annual Monitoring Report.

The intent of this report is to be consistent with the general requirements of the MECP document titled *Monitoring and Reporting for Waste Disposal Sites (WDS), Groundwater and Surface Water: Technical Guidance Document* (MOE November 2010), referred to as the "WDS Technical Guidance". The Monitoring and Screening Checklist from the WDS Technical Guidance has been completed and is included as **Appendix B** of this report. The screening checklist was completed with the Operational Status set as "open" as the Site operated throughout 2025.

1.1 Location

The WDS is located on the eastern end of Hickey Road East, approximately 850 metres (m) from the intersection with Highway 62 in the community of Hickey Settlement (Figure 01). The civic address is 202 Hickey Road, and it is located approximately 8.5 kilometres (km) south of

Maynooth, Ontario. The total Site area is 4.0 ha located on Part of Lot 30, Concession 8 (formerly Wicklow Township), and now part of the MHHs. The facility layout, road network, and Site features are shown on Figure 02 – Site Plan.

The Site includes a 3.0 ha approved footprint. There is a 30 m buffer around the footprint and a proposed Contaminant Attenuation Zone (CAZ) of 1.12 ha to the south of the 4.0 ha WDS area.

1.2 Site Ownership and Key Personnel

The facility is owned and operated by the MHHs, with the Municipal office located in Maynooth, Ontario.

As of March 2025, the transfer of the 4.0 ha WDS property from the Ministry of Natural Resources (MNR) to MHHs remains in the final stages of documentation, with registration on title anticipated in the near future. The transfer of the easement for the 1.12 ha CAZ area, shown on Figure 04, is also still in progress.

The Municipality initiated consultations with MNR regarding the WDS property in 2015. Since then, several steps, including Environmental Assessment requirements, Indigenous consultations, and public consultations, have been completed to enable the Municipality to purchase the property and secure the CAZ easement.

The facility's operational representative is responsible for all activities on-site. The Site contact is David Stewart, of MHHs and the Competent Environmental Practitioner (CEP) for both groundwater and surface water is Jaclyn Kalesnikoff, P.Geo., of BluMetric. Ms. Kalesnikoff is a Professional Geoscientist, as designated by Professional Geoscientists of Ontario (PGO). Contact information is outlined in the following Table 1.

Table 1: Contact Information

	Name	Address	Phone Number	Email
Site Owner/ Contact	The Corporation of the Municipality of Hastings Highlands CAO – David Stewart	P.O. Box 130 33011 Highway No. 62 Maynooth, ON K0L 2S0	(613) 338 – 2811 x 289	dstewart@hastingshighlands.ca
CEP	Jaclyn Kalesnikoff, P.Geo., BluMetric Environmental	1682 Woodward Dr, Ottawa, ON K2C 3R8	(877) 487 – 8436 x 339	jkalesnikoff@blumetric.ca

1.3 Description and Development of the Site

The Site has a total site area of 4.0 ha with a 3-ha landfilling area. In addition to domestic waste, Hickey Road WDS includes recycling bins for metal, plastic, paper/cardboard products, as well as segregated areas for scrap metal, tires, large bulky items, and brush. The Ontario Electronic Stewardship (OES) has approved the Hickey Road WDS for the collection of Waste Electrical and Electronic Equipment (WEEE) wastes. New regulations came into effect in 2020 with respect to this material, now referred to as Electrical and Electronic Equipment (EEE). The new regulation with respect to EEE falls under the Resource Recovery and Circular Economy Act, 2016, and the regulation was filed on September 21, 2020.

The Site is in a former sand and gravel pit within a forested area, surrounded by Crown land to the north, east, and south. It is believed that the first waste was placed in the 1960s or early 1970s. It is our understanding that the MECP has records dating back to 1971. Historically, domestic wastes were disposed of in trenches, however, the Site is currently using an area fill method of operation.

A memorandum issued by the MECP on June 27, 2024 (**Appendix A-3**) provides a review of the hydrogeological components of the 2023 Annual Monitoring Report (BluMetric, 2024) for the Site. The MECP confirmed that groundwater flow is predominantly to the south with an easterly component, consistent with historical interpretations, and noted the presence of potential downgradient groundwater and surface water receptors. Based on observed exceedances at select downgradient monitoring wells, the MECP concluded that the Site was not in compliance with Guideline B-7 at the time of review; however, it was noted that compliance is anticipated upon completion of the CAZ acquisition.

The MECP generally concurred with the proposed groundwater trigger mechanisms and contingency plan, and supported the recommendation to install an additional monitoring well along the eastern and southeastern Site boundaries. However, the MECP did not support the proposed reduction in groundwater monitoring frequency, citing the presence of receptors and the ongoing CAZ acquisition. Additional comments included the need to incorporate volatile organic compounds (VOCs) analysis in future monitoring programs, obtain information on nearby private water supply wells, and continue consultation with MECP surface water reviewers. The MECP also reiterated its recommendation that groundwater monitoring and compliance with Guideline B-7 be incorporated as conditions in a future amendment to the ECA.

A routine planned inspection of the Hickey Road WDS was conducted by the MECP Belleville Office on and about July 9, 2025, to assess compliance with the conditions of the ECA and relevant waste-related regulations. At the time of the inspection, the WDS was operational (open) but closed to the public. The inspection was attended by the Operations Manager for the Municipality of Hastings Highlands and MECP representatives.

The inspection identified one non-compliance related to the acquisition of Crown land for the WDS and the 1.12 ha CAZ, which had not yet been finalized in writing. A follow-up MECP memorandum dated August 20, 2025, confirmed that the process remains in the final stages, with anticipated registration on title in 2025. Minor administrative issues in the amended ECA (July 19, 2025), including mislabeling of certain CAZ-related conditions, were noted and expected to be corrected in the next amendment. No other significant operational concerns were observed, although continued litter management and placement of additional cover material on the previous waste cell were recommended. The full MECP Inspection report is provided in **Appendix A-4** and the follow up MECP inspection letter is provided in **Appendix A-5**.

1.4 Monitoring and Reporting Program and Objectives and Requirements

The objectives of the monitoring and reporting program are to identify and mitigate impacts to the environment caused by the municipal solid WDS. In addition, the monitoring and reporting program are designed to adhere to the WDS Technical Guidance and the ECA for the Site.

An ECA amendment was issued on July 17, 2025, and the Site now operates under the amended approval. Landfill gas monitoring is required under Section 8(1) of the amended ECA. Groundwater and surface water monitoring are specified under Sections 8(2–7) and Schedule 2. The updated groundwater and surface water Trigger Mechanisms and Contingency Plans were reviewed and accepted by the MECP under Sections 8(8–11). These updated requirements are implemented as part of the 2025 monitoring program, with results summarized in this report.

2 Physical Setting

2.1 Geology and Hydrogeology

2.1.1 Surficial Geology

The surficial geology underlying the Site is sand with some gravel as determined from the monitoring well logs which are provided in **Appendix C**. There are ten monitoring well locations on-site with each being drilled to depths ranging from approximately 6.7 to 9.14 m below ground surface (mbgs) in a sand unit. The surficial geology of the area is described as glaciofluvial outwash deposits (MNDM, 2556).

2.1.2 Overburden Hydrogeology

On October 23, 2019, slug-bail testing was carried out on two of the new monitoring wells (HR7-19 and HR8-19). The results of the field testing were analyzed using the Hvorslev analyses for the overburden sand unit at HR7-19, and the sand unit at HR8-19. The results of these analyses for the sand unit at HR7-19 were 9.62×10^{-4} metres per second (m/s) and 9.10×10^{-4} m/s. The results of these analyses at HR8-19 for the sand unit were 2.28×10^{-3} m/s and 3.14×10^{-4} m/s.

2.1.3 Bedrock Geology

The bedrock geology of the area is predominantly clastic rocks (for example, conglomerate, wacke, quartz arenite, arkose, limestone) (MNDM, Map 2544). There are minor metavolcanic rocks in the area (MNDM, Map 2544).

2.1.4 Bedrock Hydrogeology

A groundwater well information search indicates there are ten domestic wells within 1.5 km of the Site. Seven of the domestic wells are located to the northwest of the Site and are not in the direction of groundwater flow. Of these seven wells, one well is drilled to a depth of 26 mbgs, while the other six are at depths of 50 mbgs or more. Six of the seven well intakes are within bedrock.

Two of the domestic wells are located to the southwest of the Site and are not in the direction of groundwater flow. These wells are drilled to a depth of 48 mbgs and 60 mbgs and both intakes are within bedrock.

One domestic well is located southeast of Site and is in the direction of groundwater flow. This well is drilled to a depth of 23 mbgs and the intake is within gravel.

The groundwater well search did not result in well information for the two closest residences; however, it is presumed there are wells at these locations.

2.2 Surface Water Features

Based on topography, surface water and groundwater flowing from the Site likely travels towards an unnamed tributary to the south-east which eventually enters Bird Creek located approximately 0.7 km to the south.

2.3 Potential Receptors

Potential groundwater and surface water receptors in the area surrounding the Site include:

- Residential houses that comprise what is known as Hickey Settlement, 1.3 km west of the Site (low potential based on groundwater and surface water flow direction);
- Domestic well located 1.2 km south-east of the Site;
- Bird Creek Junction, 0.7 km south of the Site; and
- Unnamed tributary of Bird Creek directly south/south-east of the Site.

Site personnel confirmed the flow of Bird Creek in the fall of 2016 to be southward at Hickey Road; therefore O'Shaughnessy Lake is not a potential receptor.

3 Monitoring Program

3.1 Site Inspections and Operational Monitoring

Site visits to the Hickey Road WDS were conducted on May 7 and October 22, 2025. The detailed site checklists are provided in **Appendix D-1**. Generally, the Site was in good condition, and the following concerns were noted:

- During the spring 2025 site visit, the working active/trench area was noted as a large, uncovered area of waste.
- During the fall 2025 site visit, the working active/trench area was noted as moderate size and not covered or packed.

No other concerns were identified. Select photographs taken during the Site visits are provided at the end of the text following the tables and figures.

3.2 Monitoring Locations, Frequency, and Monitoring Parameters

3.2.1 Groundwater Monitoring

The Hickey Road WDS is monitored on a semi-annual basis (spring and fall) for groundwater. There are currently ten groundwater monitoring wells located at the Site. Four groundwater monitoring well drilling events have occurred at the Site. The first drilling program was initiated in 2003, with the completion of HR1-03, HR2-03, and HR3-03. In 2010, HR4-10 and HR5-10 were drilled and installed. In 2019, HR6-19, HR7-19, and HR8-19 were drilled and added to the groundwater monitoring program. In the summer of 2021, HR9-21 and HR10-21 were drilled and installed. The monitoring wells at the Site are drilled to bottom depths ranging from 6.7 to 9.14 mbgs. The groundwater sampling locations are illustrated on the Site Plan (Figure 02). Table 2 summarizes the GPS co-ordinates and location description of the groundwater monitoring wells. Monitoring well logs are provided in **Appendix C**.

Table 2: Groundwater Monitoring Well Details

Sample Location	Northing (m)	Easting (m)	Location Description	Screened Interval
HR1-03	5005344	273269	5 m upgradient of WDS	Slot 10 PVC screen – from 3.7 to 6.7 metres below ground surface (mbgs)
HR2-03R	5005293	273292	Middle of waste area	Slot 10 PVC screen – from 4.3 to 7.3 mbgs
HR3-03	5005374	273160	West section of WDS	Slot 10 PVC screen – from 3.7 to 6.7 mbgs
HR4-10	5005251	273247	Directly downgradient of active waste area	Slot 10 PVC screen – 4.57 to 7.62 mbgs
HR5-10	5005256	273280	Directly downgradient of historical trench area	Slot 10 PVC screen – 5.18 to 8.22 mbgs
HR6-19	5005336	273359	East area of WDS	Slot 10 PVC screen – 4.47 to 7.52 mbgs
HR7-19	5005201	273298	70 m south-southeast of HR5-10 (footprint toe)	Slot 10 PVC screen – 4.57 to 7.62 mbgs
HR8-19	5005213	273243	45 m south of HR4-10 (footprint toe)	Slot 10 PVC screen – 4.23 to 7.28 mbgs

Sample Location	Northing (m)	Easting (m)	Location Description	Screened Interval
HR9-21	5005132	273305	130 m from south toe of footprint, 10 m from south CAZ Boundary	Slot 10 PVC screen – 4.42 to 7.48 mbgs
HR10-21	5005129	273239	130 m from southwest toe of footprint, 8 m from west CAZ Boundary	Slot 10 PVC screen – 6.1 to 9.14 mbgs

Note: Site Survey October 21, 2021, NAD 83, and Zone 18.

During the monitoring events in 2025, the conditions of groundwater monitoring wells were inspected. Any repairs, such as new locks, labels or well caps, were made as necessary. Protective casings with proper annular space seals remain in place to ensure that surface water or foreign materials cannot enter groundwater monitoring wells. Monitoring wells are fitted with a vermin-proof cap to meet the requirements of Ontario Regulation 903 and are locked to provide protection against vandalism and are in line with industry best practices.

Groundwater samples were collected on May 7 and October 22, 2025. The laboratory reports and chain of custody records are included in **Appendix D-2**. Table 3 lists the groundwater quality parameters tested as per Schedule B of the ECA. Field measurements of groundwater pH, temperature, and conductivity are collected at the time of sampling.

Table 3: Groundwater Quality Monitoring Parameters

Category	Parameters
Organic Parameters	Dissolved Organic Carbon (DOC)
Inorganic Parameters	Alkalinity, Ammonia (N)-Total, Calcium, Chloride, Sodium, Potassium, Magnesium, Nitrate, Sulphate
Metals	Aluminum, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Silicon, Silver, Strontium, Thallium, Titanium, Vanadium, Zinc
Physical/Chemical Parameters	Chemical Oxygen Demand (COD), Conductivity, pH, Total Dissolved Solids (TDS)

3.2.1.1 Groundwater Gradients and Flow Direction

During each monitoring event, groundwater elevations were collected from each monitoring well (results are presented in Table 4). Groundwater level measurements were collected using a Solinst electronic water level meter prior to the purging/sampling activity.

Table 4: Groundwater Elevation Data

Groundwater Monitor	Elevation (TPVC)* (masl)	Water Level (m) 7-May-25	Groundwater Elevation (masl) 7-May-25	Water Level (m) 22-Oct-25	Groundwater Elevation (masl) 22-Oct-25
HR1-03	363.06	3.58	359.476	6.84	356.22
HR2-03R	363.02	5.455	357.566	7.35	355.67
HR3-03	363.49	3.55	359.942	6.24	357.25
HR4-10	362.93	5.63	357.301	7.22	355.71
HR5-10	363.22	6.01	357.206	7.63	355.59
HR6-19	363.35	4.43	358.921	7.41	355.94
HR7-19	362.12	5.32	356.802	6.72	355.40
HR8-19	360.89	3.76	357.130	5.25	355.64
HR9-21	360.51	4.16	356.348	5.27	355.24
HR10-21	362.62	5.94	356.680	7.27	355.35

Notes:
Elevation survey was completed on October 21, 2021, NAD 83, and Zone 18.
*TPVC – Elevation in metres above sea level (masl) at top of PVC casing

Based on the spring 2025 groundwater elevation data, groundwater flow is inferred to be toward the south with a slight easterly component at an estimated horizontal gradient of 0.013 m/m. Fall 2025 groundwater elevation data indicate a similar flow direction toward the south with a slight easterly component at an estimated gradient of 0.009 m/m. These flow directions and gradients are consistent with recent historical observations, indicating an overall predominant southward groundwater flow direction. The spring and fall groundwater elevation contours are presented on Figures 04 and 05, respectively.

3.2.2 Surface Water Monitoring

The Hickey Road WDS is monitored on a semi-annual basis (spring and fall) for surface water, which was conducted on May 7 and October 22, 2025. The details for the four surface water sample locations are described in Table 5.

Table 5: Surface Water Monitoring Locations

Sample Location	Northing* (m)	Easting* (m)	Location Description
HR-SW1	5005328	273480	125 m east and upgradient of WDS (approximate 368 m elevation**)
HR-SW2	5005204	273329	70 m downgradient of waste disposal site
HR-SW3	5005096	273326	175 m downgradient of waste disposal site
HR-SW4	5005482	273450	Approximately 167 m northeast and upgradient of WDS (approximate 382 m elevation**)

Note: *NAD 83 and Zone 18, **Based on Google Earth, 2019 imagery.

Surface water was analyzed for the parameters listed in Table 6.

Table 6: Surface Water Quality Monitoring Parameters

Category	Parameters
Organic Parameters	Biochemical Oxygen Demand (BOD_5), Phosphorous (total), Total Kjeldahl Nitrogen (TKN),
Inorganic Parameters	Alkalinity, Ammonia (N)-Total, Calcium, Chloride, Nitrite, Nitrate, Sulphate, Potassium, Sodium, Magnesium
Metals	Aluminum (dissolved), Barium, Boron, Cobalt, Copper, Iron, Lead, Manganese, Zinc
Physical/Chemical Parameters	Chemical Oxygen Demand (COD), Conductivity, Hardness, pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS)

Surface water flow velocity measurements were collected by using a Global Flow Probe for open channel flow. The flow velocity in meters per second (m/s) was recorded along with the width and depth of flow. Table 7 summarizes the collected flow velocity and channel measurements and presents the calculated discharge for each location.

Table 7: Surface Water Sampling Observations

Location	Date	Discharge[1] (m^3/s)	Flow & Channel Measurements & Observations
HR-SW1 (upgradient)	May 7, 2025	0.02	Depth: 0.08 m, Width: 1.25 m, Flow Velocity: 0.20 m/s Water clear
	October 22, 2025	-	Location dry
HR-SW2	May 7, 2025	0.0225	Depth: 0.15 m, Width: 1.0 m, Flow Velocity: 0.15 m/s The water is clear. Blown plastics in creek upstream and downstream of monitoring location
	October 22, 2025	-	Location dry
HR-SW3	May 7, 2025	N/A	Large, flooded area, no direct channel The water is clear.
	October 22, 2025	-	Location dry
HR-SW4	May 7, 2025	0.0015	Depth: 0.05 m, Width: 0.20 m, Flow Velocity: 0.15 m/s Water is clear.
	October 22, 2025	-	Location dry

Note: [1] Calculated assuming a simple channel with a rectangular cross-section.

Dry conditions were observed during the October 22, 2025, Site visit at all surface water locations.

3.2.3 Landfill Gas Monitoring

The primary gas present at landfill sites is methane. Methane cannot cause an explosion unless it accumulates to a concentration above its lower explosive limit (LEL) in an enclosed area. The LEL for methane is 5% in air. Regulation 232/98 methane concentration limits are:

- Less than 2.5% methane gas (25,000 ppm, LEL=50%) in the subsurface at the property boundary;
- Less than 1.0% methane gas (10,000 ppm, LEL=20%) in an on-site building, or its foundation; and
- Less than 0.05 % methane gas (500 ppm, LEL=1%) in a building, or its foundation, which is located off-site.

Routine landfill gas monitoring within any buildings or structures is required at the Site.

3.3 Monitoring Procedures and Methods

3.3.1 Groundwater Monitoring

Groundwater monitors were purged a minimum of three borehole volumes or until the monitor purged dry. In the case where a monitor was purged dry, samples were collected after sufficient water had returned for sampling purposes. Field temperature, pH, conductivity, and oxidation reduction potential (ORP) measurements were recorded at the time of sampling using a YSI Professional Series multi-meter. The instrument was calibrated and/or checked for pH and conductivity. Samples were field filtered for DOC and metals analyses. Samples were collected in laboratory prepared and supplied bottles and submitted to Bureau Veritas in Ontario for analyses. Bureau Veritas is an accredited member of the Canadian Association of Laboratory Accreditation (CALA). Groundwater samples were stored at approximately 4° Celsius during shipment to Bureau Veritas for chemical analyses. Holding times for samples conformed to CCME Standards where applicable (CCME, 1993). Chain of custody forms accompanied the samples from submittal to the laboratory until the chemical results were provided to BluMetric. Laboratory reports and chain of custody forms are compiled in **Appendix D-2**.

3.3.2 Surface Water Monitoring

Field parameters are recorded at the time of sampling, these include temperature, pH, and conductivity measurements. During the sampling event, the field parameters were measured using a multi-meter calibrated as per the manufacturer's instructions and checked against known calibration standards. Surface water samples were field filtered for dissolved aluminum analysis.

Surface water samples were collected in laboratory prepared and supplied bottles and submitted to Bureau Veritas in Ontario for analyses. Surface water samples were stored at approximately 4° Celsius during shipment to Bureau Veritas for chemical analyses. Holding times for samples conformed to CCME Standards where applicable (CCME, 1993). Chain of custody forms accompanied the samples from submittal to the laboratory until the chemical results were provided to BluMetric. Laboratory reports and chain of custody forms are compiled in **Appendix D-3**.

3.3.3 Landfill Gas Monitoring

There are no sampling valves, ports, or vapour monitors on-site. Gas monitoring measurements were collected from the on-site attendant's building and the groundwater monitoring wells during 2025. Gas monitoring measurements from the building are collected by inserting the intake of the gas monitoring equipment through a small hole or gap within the structures while these structures remain closed. Gas monitoring measurements from the groundwater monitoring wells are collected prior to collecting groundwater levels or samples, by inserting the intake of the gas monitoring equipment under the cap of the monitoring well prior to removal of the cap and by keeping the best seal possible around the cap and gas equipment intake.

3.3.4 Field QA/QC Program

The Quality Assurance/Quality Control (QA/QC) program for the Site included the collection of field duplicate samples to demonstrate that field sampling techniques utilized by BluMetric personnel are capable of yielding reproducible results. Field duplicates were collected concurrently with the original sample. One field duplicate was collected for groundwater parameters and one field duplicate was collected for surface water parameters during the spring event. One field duplicate was collected for groundwater parameters during the fall event.

Precision is a measure of the reproducibility of analytical results and can be expressed quantitatively by the relative percent difference (RPD) between the original sample(s) and their corresponding field blind duplicate sample(s).

The RPD is defined by the following equation:

$$RPD = 2 \times \left[\frac{(S - D)}{(S + D)}\right] \times 100$$

Where: S = parameter concentration of the original sample
D = parameter concentration of the duplicate

An RPD is calculated where the average of the measured parameter concentrations of the original (S) and duplicate (D) samples are greater than 5X the laboratory reported detection limits (RDL), which represents the RPD qualification criteria. A lower level of precision is expected where the above criteria are not met. A high level of reproducibility with respect to sample results collected at the Site is indicated by an RPD value below 10% for electrical conductivity, 20% for metals and inorganics, and 30% for BTEX and PHC. These criteria are used as a general guideline and correspond to those recommended within the O. Reg. 153/04 Analytical Protocol (MOE, 2011) and by the Ontario QA/QC Interpretation Guide – Environmental Services (Maxxam, 2015). An RPD below the recommended criteria is considered acceptable, indicating that the sampling methodology is capable of producing repeatable results.

All equipment for field parameter testing and gas monitoring are calibrated in the field during each sampling event, or by the supplier.

4 Monitoring Results

4.1 Groundwater Quality

Groundwater quality has been compared to the Ontario Drinking Water Standards and Operational Guidelines (ODWSOG), the calculated Reasonable Use Values (RUVs), and the Provincial Water Quality Objectives (PWQO).

Field Measurements

The summary of the 2025 field measurements for groundwater pH, temperature, and conductivity are presented in Table 8.

Table 8: Groundwater Quality Field Measurements

Groundwater Monitor	pH		Temperature (°C)		Conductivity (µS/cm)	
	7-May-25	22-Oct-25	7-May-25	22-Oct-25	7-May-25	22-Oct-25
HR1-03	6.23	-	76.8	-	108.2	-
HR2-03R	6.41	6.40	8.6	9.5	1098	745
HR3-03	6.49	6.57	6.1	7.6	276.2	134.6
HR4-10	6.36	6.72	8.6	8.4	715	1532
HR5-10	6.37	6.46	89.8	9.5	779	1091
HR6-19	6.52	-	6.5	-	602	-
HR7-19	6.35	6.48	8.2	7.8	920	858
HR8-19	6.19	7.20	7.4	8.4	255.7	76.6
HR9-21	6.10	6.07	6.6	8.1	40.0	45.8
HR10-21	6.20	6.45	8.8	8.6	74.8	50.0

Note: Insufficient water to sample HR1-03 and HW6-19 during the fall 2025 sampling event.

Ontario Drinking Water Standards and Operational Guidelines (ODWSOG)

The summary of the 2025 groundwater results exceeding the ODWSOG criteria is summarized in Table 9. The full results are presented in Table 14 at the end of the text.

Table 9: Groundwater Quality Results Exceeding ODWSOG

Location	Parameters Exceeding
HR1-03	None
HR2-03R	Aluminum (spring), DOC (spring and fall), Iron (spring and fall), Manganese (spring and fall), TDS (spring)
HR3-03	None
HR4-10	Alkalinity (fall), DOC (spring and fall), Iron (spring and fall), Manganese (spring and fall), TDS (fall)
HR5-10	DOC (spring and fall), Iron (spring and fall), Manganese (spring and fall)
HR6-19	DOC (spring), Iron (spring and fall), Manganese (spring and fall) TDS (spring)
HR7-19	DOC (spring and fall), Iron (spring and fall), Manganese (spring and fall)
HR8-19	Alkalinity (below criteria, fall)
HR9-21	Alkalinity (below criteria, spring and fall)
HR10-21	Alkalinity (below criteria, spring and fall)

Note: HR1-03 and HR6-19 were not sampled in the fall 2025.

Reasonable Use Values (RUVs)

Reasonable Use Values (RUVs) are based on the median background groundwater (HR3-03) results from 2003 to 2025 and using the following calculation.

$$Cm = Cb + x(Cr-Cb)$$

Where:

- Cm: maximum allowable concentration in groundwater beneath adjacent property (Reasonable Use Values)
- Cb: median background concentration before any effects from human activity
- Cr: maximum concentration that should be present based on use (ODWSOG)
- x: constant that reduces the contamination to a level considered by the MOE to have only a negligible effect on the use of the water (0.25 for a health-related parameter and 0.5 for an aesthetic or physical parameter)

Table 10 below provides a summary of the parameters in groundwater with RUV exceedances for the Site during 2025. The results for all the chemical parameters tested are presented in Table 14 at the end of the text. It should be noted that the RUVs are used to assess compliance at the property boundary but have been used as an assessment tool at all monitoring wells.

Table 10: Groundwater Quality Results Exceeding RUV Criteria

Location	Parameters Exceeding
HR1-03	None
HR2-03R	Alkalinity (spring), Aluminum (spring and fall), Barium (spring), DOC (spring and fall), Iron (spring and fall, Manganese (spring and fall) TDS (spring and fall),
HR3-03	None
HR4-10	Alkalinity (fall), Barium (spring and fall), DOC (spring and fall), Iron (spring and fall), Manganese (spring and fall), TDS (spring and fall), Sodium (fall),
HR5-10	Alkalinity (fall), DOC (spring and fall), Iron (spring and fall), Manganese (spring and fall), TDS (spring and fall)
HR6-19	DOC (spring), Iron (spring), Manganese (spring), TDS (spring)
HR7-19	Alkalinity (spring and fall), Barium (spring and fall), DOC (spring and fall), Iron (spring and fall), Manganese (spring and fall), TDS (spring and fall)
HR8-19	DOC (Spring)
HR9-21	None
HR10-21	None

Note: HR1-03 and HR6-19 were not sampled in the fall 2025.

Provincial Water Quality Objectives (PWQO)

Groundwater has the potential to discharge to surface water at the Hickey Road WDS, therefore groundwater has also been compared to the PWQO criteria; the results are presented in Table 14 at the end of the text. Table 11 below summarizes the groundwater parameters that exceeded PWQO in 2025.

Table 11: Groundwater Quality Results Exceeding PWQO

Location	Parameters Exceeding
HR1-03	None
HR2-03R	Aluminum (spring), Cobalt (spring and fall), Iron (spring and fall), Vanadium (spring)
HR3-03	Cobalt (spring and fall)
HR4-10	Boron (spring and fall), Cobalt (spring and fall), Iron (spring and fall), Vanadium (fall)
HR5-10	Boron (fall), Cobalt (spring and fall), Iron (spring and fall)
HR6-19	Iron (spring)
HR7-19	Boron (spring and fall), Cobalt (spring and fall), Iron (spring and fall)
HR8-19	DOC (spring)
HR9-21	None
HR10-21	None

Note: HR1-03 and HR6-19 were not sampled in the fall 2025.

4.2 Surface Water Quality

Surface water quality results were compared to PWQO, and the MECP Table A and Table B criteria of the WDS Technical Guidance. The following Table 12 summarizes the parameters that exceeded the criteria. All the surface water results are summarized in Table 15 at the end of the text.

Following a review of the 2024 surface water monitoring program by the MECP of another MHH Site from 2025, it was noted that the WDS Technical Guidance Table A and Table B criteria were a draft and never adopted by the MECP. The MECP has indicated that the Table A and Table B criteria should not be used for the evaluation of surface water quality and therefore will not be discussed in the body of this report. Table 12 summarizes the parameters that exceeded PWQO criteria only.

Table 12: Surface Water Quality Results Exceeding Criteria

Surface Water Monitoring Location	Parameter Exceeding	Criteria	2025 Sampling Event
HR-SW1 (background)	None	-	-
HR-SW2	None	-	-
HR-SW3	None	-	-
HR-SW4 (further upstream of background)	Aluminum (dissolved), Copper (total)	PWQO	May

4.3 Landfill Gas Monitoring

Gas readings collected on May 7, 2025, are as follows: 15 ppm at HR1-03, 10 ppm at HR3-03 and HR9-21, 0 ppm at HR4-10, 15 ppm at HR5-10, HR6-19 and HR8-19, 5 ppm at HR7-19, and 25 ppm at HR10-21. The reading at HR2-03R was 35% LEL (lower explosive limit). A gas reading of 0 ppm was collected from the attendant's building.

Gas readings collected on October 22, 2025, are as follows: 0 ppm at HR1-03, HR3-03, HR5-10, HR7-19, HR8-19, HR9-21 and HR10-21, 20 ppm at HR4-10, and 330 ppm at HR6-19. The reading at HR2-03R was over the LEL (lower explosive limit). A gas reading of 0 ppm was collected from the attendant's building.

4.4 QA/QC Results

The consistency of the analytical results was evaluated based on the relative percentage difference (RPD) of each field duplicate pair (see QAQC comparisons in **Appendix D-4**). The only field duplicate pair which had higher RPD than what is considered acceptable was the following:

- Total Dissolved Solids for the fall groundwater event (22%)

The maximum RPD parameter by season for groundwater was nitrate and DOC in the spring (4%) and TDS in the fall (22%). The maximum duplicate pair by season for surface water was aluminum (6%) in the spring and no samples were taken in the fall.

5 Assessment, Interpretation, and Discussion

5.1 Groundwater Assessment

As mentioned previously, Table 14 at the end of the text provides the 2025 groundwater chemistry data in comparison to groundwater and surface water criteria. Historical groundwater chemistry up to and including 2025 is provided in **Appendix E-1.**

HR3-03 (Background Well)
HR3-03, located upgradient in the northwest corner of the Site boundary, is used as the background monitoring location for RUV calculations. In 2025, no RUV or ODWQS exceedances were identified at this location. Exceedances of the PWQO for cobalt were observed during both the spring and fall monitoring events. Historically, HR3-03 has exhibited frequent PWQO exceedances for cobalt since spring 2021. Isolated ODWQS exceedances for DOC, attributed to natural variation, have also been observed historically, as well as a single ODWQS exceedance for aluminum and iron in 2011.

HR1-03 (Upgradient Well)
Monitoring well HR1-03 is located adjacent to the western side of the attendant's shack, to the west and upgradient of the waste mound. In 2025, no exceedances were identified at this location. Historically, HR1-03 exhibited consistent ODWQS exceedances for DOC between 2007 and 2012, with two additional exceedances occurring in 2014 and 2017; however, no DOC exceedances have been recorded since 2017. Infrequent ODWQS "below criteria" exceedances for alkalinity have also been observed, occurring in 2006, 2008, 2014, and most recently in 2020. HR1-03 is not considered to be impacted by leachate.

HR2-03R (Leachate Well)
Monitoring well HR2-03R is located within the waste footprint, between the recent active fill area and the current active fill area.

In 2025, spring sampling at HR2-03R indicated ODWQS exceedances for DOC, TDS, aluminum, iron, and manganese, along with PWQO exceedances for aluminum, cobalt, iron, and vanadium. Fall 2025 sampling indicated ODWQS exceedances for DOC, iron, and manganese, and PWQO exceedances for cobalt and iron.

Historically, HR2-03R has consistently exceeded ODWQS for iron and manganese, and ODWQS for DOC since 2021. PWQO exceedances for cobalt have been consistent, while aluminum has shown frequent PWQO and occasional ODWQS exceedances. Two TDS exceedances occurred in spring 2023 and 2025, and two isolated PWQO exceedances for vanadium also occurred in spring 2023 and 2025, coinciding with the ODWQS exceedances for aluminum and TDS.

Compared to background well HR3-03, HR2-03R shows elevated concentrations of alkalinity, ammonia, boron, barium, chloride, calcium, COD, conductivity, cobalt, copper, DOC, iron, magnesium, manganese, potassium, sodium, sulphate, and TDS, though these parameters typically remain within ODWQS criteria. Based on its location and water quality results, HR2-03R is considered leachate-impacted.

HR4-10 (Downgradient Well)
Monitoring well HR4-10 is located immediately downgradient and to the southwest of the waste mound.

In spring 2025, HR4-10 exhibited ODWQS exceedances for DOC, iron, and manganese, and PWQO exceedances for boron, cobalt, and iron. During the fall 2025 monitoring event, HR4-10 exhibited ODWQS exceedances for alkalinity, DOC, TDS, iron, and manganese, and PWQO exceedances for boron, cobalt, iron, and vanadium.

Historically, HR4-10 has consistently exceeded the ODWQS for DOC, iron, and manganese, and the PWQO for boron, cobalt, and iron. PWQO exceedances for vanadium and ODWQS exceedances for TDS occur frequently, most often during fall monitoring events. Occasional ODWQS exceedances for alkalinity have also been observed, along with infrequent ODWQS and PWQO exceedances for aluminum.

When compared to background and upgradient conditions at HR3-03 and HR1-03, HR4-10 shows elevated concentrations of alkalinity, ammonia, barium, boron, calcium, COD, chloride, cobalt, copper, DOC, conductivity, iron, magnesium (relative to HR3-03 only), manganese, potassium (relative to HR3-03 only), sodium, and TDS. Based on these results HR4-10 is considered impacted by leachate.

HR5-10 (Downgradient Well)
Monitoring well HR5-10 is located immediately downgradient and to the south of the waste mound.

In spring 2025, HR5-10 exhibited RUV exceedances for DOC, TDS, iron, and manganese, ODWQS exceedances for DOC, iron, and manganese, and PWQO exceedances for cobalt and iron. During the fall 2025 monitoring event, HR5-10 exhibited RUV exceedances for alkalinity, DOC, TDS, iron, and manganese, ODWQS exceedances for DOC, TDS, iron, and manganese, and PWQO exceedances for boron, cobalt, and iron.

Historically, HR5-10 has consistently exceeded RUVs for DOC and TDS (beginning in 2016), iron (beginning in 2019), and manganese. It has occasionally had RUV exceedances for alkalinity and barium (beginning in 2022), with isolated exceedances for aluminum in 2022. HR5-10 has also consistently exceeded the ODWQS for iron and manganese and has often exceeded ODWQS for DOC, with exceedances occurring more frequently since 2016 and consistently since 2018. PWQO exceedances for iron have been consistent since 2019, while PWQO exceedances for cobalt have been relatively consistent since monitoring began in 2010. PWQO exceedances for boron occur frequently and are typically observed during fall monitoring events, while spring concentrations are often within criteria. Historical PWQO exceedances for copper were observed between 2017 and 2020, with concentrations remaining within criteria since that time.

When compared to background and upgradient groundwater conditions at monitoring wells HR3-03 and HR1-03, HR5-10 exhibits elevated concentrations of alkalinity, ammonia, barium, boron, calcium, COD, cobalt, copper, DOC, conductivity, iron, magnesium (relative to HR3-03 only), manganese, potassium (relative to HR3-03 only), sulphate, and TDS. Based on these results and its location downgradient of the waste mound, HR5-10 is considered impacted by leachate.

HR6-19 (Cross-Gradient Well)
Monitoring well HR6-19 is located in the eastern portion of the Site, between the waste disposal site and surface water monitoring station HR-SW1. It was installed to obtain information on the groundwater chemistry between the Sire and surface water station HR-SW1.
In spring 2025, HR6-19 exhibited RUV exceedances for DOC, TDS, iron, and manganese, ODWQS exceedances for iron and manganese, and a PWQO exceedance for iron. Insufficient water was available for sampling during the fall 2025 monitoring event.

Historically, HR6-19 has consistently exceeded RUVs for DOC, iron, and manganese, and has often exceeded RUVs for TDS, typically during spring monitoring events. ODWQS exceedances for iron and manganese have been consistent since monitoring began in 2020, along with consistent PWQO exceedances for iron over the same period. Occasional ODWQS exceedances for DOC have been observed, along with a single ODWQS exceedance for aluminum in 2021. PWQO

exceedances for aluminum were observed in 2021, and two PWQO exceedances for cobalt were observed in fall 2022 and 2023.

When compared to background and upgradient conditions at HR3-03 and HR1-03, HR6-19 exhibits elevated concentrations of alkalinity, ammonia, calcium, COD (relative to HR3-03 only), copper, conductivity, iron, manganese (relative to HR3-03 only), sulphate, and TDS. Based on these results and its location, HR6-19 is considered impacted by leachate.

HR7-19 (Downgradient Well)
Monitoring well HR7-19, located downgradient of HR4-10 and HR5-10, was installed in 2019 just south of the northern limit of the CAZ boundary to monitor downgradient impacts and assess natural attenuation at the Site.

In spring 2025, HR7-19 exhibited RUV exceedances for alkalinity, DOC, TDS, barium, iron, and manganese; ODWQS exceedances for DOC, iron, and manganese; and PWQO exceedances for boron, cobalt, and iron. During the fall 2025 monitoring event, HR7-19 exhibited the same pattern of exceedances: RUV exceedances for alkalinity, DOC, TDS, barium, iron, and manganese; ODWQS exceedances for DOC, iron, and manganese; and PWQO exceedances for boron, cobalt, and iron.

Historically, HR7-19 has consistently exceeded RUVs for DOC, iron, and manganese since 2019, and for TDS since 2020. RUV exceedances for alkalinity and barium occur frequently, with concentrations within criteria on three occasions (2021, 2022, and 2023). ODWQS exceedances for DOC, iron, and manganese have been consistent since 2019, while isolated ODWQS exceedances have been observed for TDS and a single exceedance for aluminum (2020). PWQO exceedances for boron, cobalt, and iron have been consistent since 2019, with frequent exceedances for copper and isolated exceedances for aluminum (2020), vanadium (2020), and zinc (2022).

When compared to background and upgradient monitoring wells HR3-03 and HR1-03, HR7-19 exhibits elevated concentrations of alkalinity, ammonia, barium, boron, calcium, COD, chloride, cobalt, copper, DOC, conductivity, iron, magnesium (relative to HR3-03 only), manganese, potassium (relative to HR3-03 only), sodium, sulphate, and TDS. Based on these results, HR7-19 is considered impacted by leachate.

HR8-19 (Downgradient Well)
Monitoring well HR8-19, located downgradient of HR4-10 and HR5-10, was installed in 2019 to monitor downgradient impacts and assess natural attenuation at the Site. HR8-19 is situated within the southwest portion of the 4.0 ha waste footprint, between HR4-10 and the northern CAZ boundary.

In spring 2025, HR8-19 exhibited an RUV exceedance for DOC. During the fall 2025 monitoring event, it exhibited an ODWQS exceedance for alkalinity (below criteria).

Historically, HR8-19 has shown occasional RUV exceedances for DOC, with sequential exceedances observed in 2019–2020 and 2022, but concentrations have remained within criteria since 2022. Isolated RUV exceedances for TDS and barium were observed in spring 2022.

ODWQS exceedances for alkalinity (all below criteria) occurred in fall 2019, 2023, and 2025. A single ODWQS exceedance for DOC was observed in 2022. Three ODWQS exceedances for manganese coincided with RUV exceedances, occurring most frequently in 2022. Isolated PWQO exceedances for cobalt and copper were observed in 2022.

When compared to background and upgradient monitoring wells HR3-03 and HR1-03, HR8-19 exhibits elevated concentrations of copper and manganese (relative to HR3-03), and slightly elevated concentrations of alkalinity and ammonia. Based on these results and its location, HR8-19 is considered slightly impacted by leachate, although natural attenuation is evident due to decreased concentrations relative to HR4-10.

HR9-21 (Downgradient Well)
Monitoring well HR9-21 is located within the CAZ, approximately 10 m north and upgradient of the southern CAZ boundary.

In 2025, HR9-21 exhibited ODWQS exceedances for alkalinity (below criteria) in both spring and fall.

Historically, HR9-21 has shown isolated RUV exceedances for DOC (2021), aluminum (2022), and manganese (2021 and 2023). It has consistently remained below the ODWQS criteria for alkalinity since fall 2021, which is interpreted as natural variation, given that leachate impacts at downgradient on-site wells typically elevate alkalinity. Occasional ODWQS below-criteria exceedances for pH have been observed in 2021, 2022, and 2024. Isolated ODWQS exceedances for aluminum (2022), DOC (2021), and manganese (2021 and 2023) coincide with the RUV

exceedances. Isolated PWQO exceedances have been observed for aluminum (2021, 2022, and 2024), cobalt (2021), and copper (2021 and 2024).

When compared to background conditions at HR3-03 and upgradient well HR1-03, HR9-21 exhibits slightly elevated concentrations of ammonia and copper only.

Due to the low concentrations of leachate indicator parameters and the observed exceedances likely reflecting natural wetland conditions or temporal variation in water quality rather than WDS impacts, the Site is considered compliant with Guideline B-7 along the southern and western CAZ boundaries.

HR10-21 (Downgradient Well)
Monitoring well HR10-21 is located within the CAZ, approximately 30 m north and upgradient of the southern CAZ boundary.

In 2025, HR10-21 exhibited ODWQS exceedances for alkalinity (below criteria) in both spring and fall.

Historically, HR10-21 has shown isolated RUV exceedances for DOC (2021) and aluminum (2022). It has consistently remained below the ODWQS criteria for alkalinity, which is interpreted as natural variation in groundwater quality. Occasional ODWQS below-criteria exceedances for pH were observed in 2021 and 2022. Isolated PWQO exceedances have been observed for aluminum (2021), copper (2022 and 2024), and silver (2021).

When compared to background and upgradient conditions at HR3-03 and HR1-03, HR10-21 exhibits slightly elevated concentrations of ammonia and copper only.

Due to the low concentrations of other leachate indicator parameters and the observed exceedances likely reflecting natural wetland conditions or temporal variation in water quality rather than WDS impacts, the Site is considered compliant with Guideline B-7 along the southern and western CAZ boundaries.

Guideline B-7 Comparison
Based on the inferred groundwater flow direction to the south with a slight easterly component, the current groundwater monitoring network may not fully capture potential impacts along the east and southeast property boundaries.

RUV exceedances observed at HR7-19 (alkalinity, DOC, TDS, iron, and manganese) and HR8-19 (DOC, the most downgradient wells within or along the site boundary, indicate that the Site is not in compliance with Guideline B-7 along the southern boundary. Groundwater results at HR9-21 and HR10-21, combined with the groundwater flow direction, indicate that the Site will be brought into compliance along the southern and western CAZ boundaries following formal registration of the CAZ lands to the south.

RUV exceedances at HR5-10 (DOC, TDS, iron, and manganese) and HR6-19 (DOC, TDS, iron, and manganese) indicate that the Site is not in compliance along the southeastern and eastern property boundaries. To address this, an additional monitoring well will be installed along the southeastern boundary in 2026 to assess compliance.

5.2 Surface Water Assessment

The 2025 surface water chemistry results are presented in Table 15 (end of text) and were compared to the PWQO. Historical surface water data are provided in Appendix E-2. Table 15 summarizes the parameters that exceeded criteria, including WDS Technical Guidance Tables A and B for reference only. It should be noted that the MECP has confirmed that the Table A and B criteria were draft guidance and are not to be used for evaluating surface water quality; therefore, they are not discussed in the main body of this report.

Three surface water monitoring stations are located along the intermittent unnamed tributary to Bird Creek, directly east and south of the waste disposal area: HR-SW1 (upgradient of the Site), HR-SW2 (downgradient), and HR-SW3 (downgradient). HR-SW1 and HR-SW2 were established in spring 2007, and HR-SW3 in spring 2014. An additional upgradient station, HR-SW4, was added in 2018 as a further upgradient monitoring location because HR-SW1 (the background location) showed more parameters exceeding than the downgradient locations. The 2018 results indicated that HR-SW4 had higher concentrations for some parameters than HR-SW1; consequently, it was not sampled in 2019. In 2019, an alternate background location was investigated but none were identified. HR-SW4 was reintroduced in 2020 at the request of the MECP.

In 2025, HR-SW1 had no exceedances in spring, and the location was dry in fall. HR-SW4 had PWQO exceedances for aluminum and copper in spring 2025 and was dry in fall. HR-SW2 and HR-SW3 had no exceedances in the spring and both locations were dry in the fall.

Monitoring well HR6-19, which was installed in the eastern portion of the Site to obtain information on the groundwater chemistry between the Site and surface water station HR-SW1, had a PWQO exceedance for iron in spring 2025 and was not sampled in fall due to dry conditions. The ground surface elevation at HR6-19 is 363.35 masl, with groundwater elevations between 357.0 and 358.5 masl. HR-SW1 is at approximately 368 masl. Based on these elevations and the 2025 results, it is unlikely that WDS-impacted groundwater is discharging at HR-SW1.

Historically, HR-SW1 has generally shown better water quality than HR-SW4 (BluMetric, 2021), supporting its use as a preferred background surface-water benchmark. However, in 2023, HR-SW1 had higher concentrations than HR-SW4, and in 2022, results varied between the two locations. Given these fluctuations, there is insufficient evidence to definitively select one location over the other for background monitoring. As a result, both HR-SW1 and HR-SW4 should continue to be used to assess background surface water quality. A detailed comparison of these locations is provided in Appendix E-3.

Comparisons of 2025 surface water results at HR-SW1 with downstream stations HR-SW2 and HR-SW3 were conducted for all parameters (Appendix E-3). In spring 2025, HR-SW2 had higher concentrations than HR-SW1 for sodium, COD, TKN, dissolved aluminum, and manganese, and HR-SW3 had higher concentrations for the same five parameters. When considering differences greater than 5× the RDL, only dissolved aluminum at HR-SW3 remained elevated. These downstream elevated concentrations are attributed to WDS influences; however, all parameters remained within PWQO in 2025.

It should be noted that surface water may be influenced by groundwater at the Site. Groundwater has historically been observed discharging from a bedrock outcrop near HR-SW4 (BluMetric, 2025). Interaction between groundwater and surface water at HR-SW2 and HR-SW3 is unlikely due to groundwater depths in proximal wells (approximately 5.3 mbgs at HR7-19 and 4.2 mbgs at HR9-21). Therefore, observed impacts at HR-SW2 and HR-SW3 are likely the result of current or cumulative surface runoff from the Site.

5.3 Mann-Kendall Trend Analysis

Trend analyses were conducted to support the evaluation of groundwater and surface water quality at the Site. A Mann-Kendall trend analysis was completed for each groundwater monitoring location using available analytical data beginning in 2003 or 2006 (for wells installed in 2003), 2010 (for wells installed in 2010), 2019/2020 (for wells installed in 2019), and 2021 (for wells installed in 2021).

A Mann-Kendall trend analysis was also conducted for each surface water monitoring location using available analytical results beginning in 2007, 2014, and 2020, depending on the start date of monitoring at each location.

The trend analysis was limited to the parameters that have been previously discussed to be leachate indicator parameters and parameters that have historically exceeded at the monitoring location.

HR1-03
HR1-03 exhibited decreasing trends for chloride, DOC, and manganese, while sodium demonstrated an increasing trend.

HR2-03
HR2-03 exhibited decreasing trends for DOC and manganese and increasing trends for chloride and sodium. This monitoring well was replaced by HR2-03R in 2019.

HR2-03R
HR2-03R exhibited stable trends for chloride and sodium, while no apparent trends were observed for DOC and manganese.

HR3-03
HR3-03 exhibited decreasing trends for DOC and manganese, an increasing trend for sodium, and no discernible trend for chloride.

HR4-10
HR4-10 exhibited decreasing trends for chloride and manganese, an increasing trend for DOC, and a stable trend for sodium.

HR5-10
HR5-10 exhibited increasing trends for chloride, DOC, manganese, and sodium.

HR6-19
HR6-19 exhibited a decreasing trend for manganese, a probable decreasing trend for chloride, and stable trends for DOC and sodium.

HR7-19
HR7-19 exhibited a decreasing trend for manganese, and stable trends for chloride, DOC, and sodium.

HR8-19
HR8-19 exhibited a decreasing trend for manganese, a stable trend for chloride, and no apparent trends for DOC and sodium.

HR9-21
HR9-21 exhibited probable decreasing trends for chloride and manganese, and stable trends for DOC and sodium.

HR10-21
HR10-21 exhibited a probable decreasing trend for manganese, and stable trends for chloride, DOC, and sodium.

HR-SW1
HR-SW1 exhibited a decreasing trend for chloride, a probable decreasing trend for manganese, and no apparent trends for aluminum, iron, and sodium.

HR-SW2
HR-SW2 exhibited decreasing trends for chloride and manganese, a probable decreasing trend for sodium, and no apparent trends for aluminum and iron.

HR-SW3
HR-SW3 exhibited a stable trend for chloride, and no apparent trends for iron, manganese, and sodium. A trend analysis could not be performed for aluminum, as only three samples were available and a minimum of four samples are required for trend analysis.

HR-SW4
HR-SW4 exhibited a probable decreasing trend for iron, stable trends for chloride and sodium, and no apparent trends for aluminum and manganese.

5.4 Landfill Gas Assessment

The 2025 RKI Eagle gas results indicate that methane concentrations are generally below the concentrations of concern for both subsurface (25,000 ppm, LEL = 50%) and on-site structures (10,000 ppm, LEL = 20%).

An elevated methane reading of 330 ppm was detected at HR6-19 during the fall 2025 sampling event. HR6-19 is located in the eastern portion of the Site, between the landfill and surface water station HR-SW1.

Monitoring well HR2-03 also recorded elevated methane, with 35 % LEL in spring and >100 % LEL in fall 2025. While this exceeds the subsurface concentration limit, HR2-03 is located in the centre of the property and away from any structures.

All other monitoring wells measured methane concentrations ranging from 0–25 ppm in spring and 0–20 ppm in fall, and the attendant's shack measured 0 ppm in both spring and fall 2025. Wells closer to the property boundary all remained below concentrations of concern. Additionally, no structures with basements are present on or near the Site, so the elevated gas concentrations are not considered an immediate risk.

Landfill gas should continue to be monitored semi-annually at the on-site structure and monitoring wells. Any excavation within the waste mound should implement health and safety measures to address potential landfill gas exposure.

5.5 Trigger Mechanisms and Contingency Plan

Updated groundwater and surface water Trigger Mechanisms and Contingency Plans were submitted with the ECA amendment application in September 2024 and approved as part of the ECA amendment dated July 19, 2025. The full plans are provided in **Appendix G-1** (groundwater) and **Appendix G-2** (surface water).

The groundwater plan establishes assessment points at HR9-21 (south CAZ boundary) and HR10-21 (west CAZ boundary), with triggers for barium, chloride, iron, and TDS. The Contingency Plan is triggered if three or more of these parameters exceed their RUV criteria at an assessment point for two consecutive sampling events. In 2025, the groundwater results at these assessment points did not trigger the Tier 1 Contingency Plan.

The surface water plan uses HR-SW2 and HR-SW3 as assessment points, with triggers for alkalinity, chloride, iron, manganese, TKN, and un-ionized ammonia. Three or more exceedances at an assessment point during a single sampling event would trigger the Contingency Plan. The September 2024 revision removed sodium, which had been included in error in the 2020 draft. In 2025, surface water results at HR-SW2 and HR-SW3 did not trigger the Tier 1 Contingency Plan.

6 On-Site Operations

6.1 Annual Waste Summary

Although access to the Site is controlled via a locked security steel gate, some residents deposit garbage at the disposal site outside of the landfill's normal operating hours. This contribution is collected by Site personnel, recorded, and included in the total waste volumes identified for the Site.

The annual recycling (R) and waste (W) tonnages for 2024 and 2025, excluding the segregated materials discussed in Section 6.2.1, are tabulated in Table 13. The tonnages below include recyclables and waste from both the residential and commercial sources within the municipality. Based on the estimated numbers, a total of 12.2% of residential waste was recycled in 2025, which is slightly below the 13.3% recycled in 2024.

Table 13: Annual Recycling and Waste Tonnages

Q1		Q2		Q3		Q4		Year end	
2024									
R	**W**	**R**	**W**	**R**	**W**	**R**	**W**	**R**	**W**
4.6	28.8	5.1	36.3	9.6	49.7	4.0	36.5	**23.3**	**151.3**
2025									
R	**W**	**R**	**W**	**R**	**W**	**R**	**W**	**R**	**W**
4.49	34.3	4.6	38.8	5.88	52.9	7.04	32.8	**21.96**	**158.7**

The 2025 numbers indicate a 5.9% decrease in 2025 in the residential and commercial recycling of mixed fibres and commingled containers at the Hickey Road WDS. There was a 4.9% increase in the amount of waste placed at the Site in 2025 from 2024. The 2025 residential and commercial waste calculations are based on bag counts at the waste site. There were 10,582 bags recorded to be deposited at the Hickey Road WDS in 2025 and an assumed 15 kg/bag (MHHs) was used in the tonnage calculations.

6.1.1 Summary of Segregated Materials Removed

Segregated materials are collected at each of the nine WDSs/WTSs in Hastings Highlands. The breakdown of these wastes in 2025 at the Hickey Road WDS was:

- Scrap Metal – 0 tonnes
- Bulky Wastes – 0 tonnes
- Electrical and Electronic Equipment – 0 tonnes
- 0 Tires

Household hazardous wastes are not accepted at the Hickey Road WDS; however, the Municipality ensures that any batteries left at the Site are disposed of properly. In 2025, no batteries were collected across the nine WDS/WTS locations in Hastings Highlands.

6.2 Annual Complaints Summary

There were no documented complaints at the Hickey Road WDS and there were no emergency situations in 2025.

6.3 Capacity

The ECA approves a total Site volume of 74,100 cubic metres (m^3) including historical waste, daily cover, and intermediate cover (excluding final cover). This volume includes the historical waste volume of 32,300 m^3 as of 2016. According to the most recent topographical survey conducted in June 2023, as shown by Figure 06, the volume remaining was 29,573 m^3.

Waste quantities for the Site were estimated based on bag counts and an estimated mass per bag. Total waste quantities for 2025 were calculated to be approximately 318 m^3, based on an assumed 500 kg/m^3 for the waste. The amount for the second half of 2023 (July to December) is estimated to be 156 m^3 (BluMetric, 2024). Taking weekly cover into account, assuming 75% of waste to 25% cover material, the total volume of waste and cover placed from July 2023 to the end of 2025 is estimated to be approximately 971 m^3. The remaining capacity at the end of 2025 is estimated to be 28,602 m^3. Using a 5-year waste quantity average (2021 to 2025) of 301.6 m^3/year and taking weekly cover into account, the life expectancy of the WDS was calculated to be 75 years.
A Closure Plan must be submitted two years prior to the anticipated closure of the Site as identified in Condition 9 of the ECA.

7 Summary Statements, Conclusions, and Recommendations

The following summary statements are based on the observations and results from the 2025 monitoring program:

7.1 Site Operations

- Site operations, Site conditions and the order and the management of debris have greatly improved in recent years, the Municipality should continue these efforts.
- During the 2025 Site visits, the active/trench area was observed as a large, uncovered area in spring and moderate in size but not covered or compacted in fall. General maintenance should ensure the active face is regularly maintained with compacted weekly cover and that only a limited amount of exposed waste is present at any time.
- Material segregation areas should be kept orderly to prevent comingling of material and should be removed from site as needed to maintain space within the segregation boundaries.
- Wind-blown litter should be cleaned up on a regular basis.
- It is recommended that waste transferred to the Site continue to be accounted for and documented by tracking the number of bags and/or vehicle loads of waste deposited at the Site. Detailed descriptions and quantities of rejected waste should continue to be documented for the Hickey Road WDS.
- Public education with respect to waste reduction and recycling should be an ongoing effort by the Municipality.
- The Site Attendant should ensure metal containers coming into the Site do not contain any hazardous materials or liquids.
- An amended ECA was issued on July 19, 2025, under which the Site now operates, including updated provisions for groundwater and surface water monitoring, landfill gas management, and trigger mechanisms and contingency plans.
- A routine MECP inspection was completed on July 9, 2025. The inspection identified one non-compliance related to the acquisition of Crown land for the WDS and the 1.12 ha CAZ, which has not yet been finalized in writing. No other significant operational concerns were noted, though continued litter management and placement of cover material on the previous waste cell were recommended.
- As per the MECP review of the 2023 Annual Monitoring Report (**Appendix A-3**), no well information was available for the two closest residences to the Site. Additional information and impact analysis are required for these water supply wells.

7.2 Groundwater

- Groundwater flow direction is primarily to the south with a slight easterly component, consistent with historical observations.
- Groundwater quality results in 2025 are generally consistent with historical trends, with leachate-impacted conditions observed in wells located within and immediately downgradient of the waste footprint (e.g., HR2-03R, HR4-10, HR5-10, HR6-19, and HR7-19), and reduced impacts observed at more distal locations.
- Background and upgradient monitoring wells (HR3-03 and HR1-03) continue to show no evidence of leachate impacts, with groundwater quality reflecting natural conditions.
- Monitoring wells HR9-21 and HR10-21 exhibit low concentrations of leachate indicator parameters, with observed exceedances attributed to natural variation or wetland conditions rather than Site-related impacts.
- Based on groundwater quality at HR3-03 (background), HR9-21, and HR10-21, the Site is considered to be compliant with Guideline B-7 along the southern and western CAZ boundaries. However, RUV exceedances observed at downgradient wells HR7-19 and HR8-19 indicate that the Site is not currently in compliance along the southern property boundary outside of the proposed CAZ limits; compliance is anticipated following formal registration of the CAZ lands to the south.
- RUV exceedances at HR5-10 and HR6-19 indicate that the Site is not in compliance along the eastern and southeastern property boundaries. The current groundwater monitoring network may not fully capture potential impacts in these areas; therefore, installation of an additional groundwater monitoring well along the southeastern boundary is recommended to further assess compliance.
- A Mann-Kendall trend analysis was completed for the first time in 2025 to evaluate long-term groundwater quality trends at the Site. Increasing trends in key leachate indicator parameters (chloride, DOC, manganese, and sodium) were identified at HR5-10, while HR4-10 exhibited an increasing trend in DOC but decreasing trends in chloride and manganese.
- At other monitoring locations, trends were generally stable or decreasing. In particular, HR6-19, HR7-19, HR8-19, HR9-21, and HR10-21 exhibit stable to decreasing trends in parameters such as chloride and manganese, indicating no consistent increasing trends in leachate impacts at downgradient and boundary locations.
- It is recommended that monitoring well HR2-03R be extended (i.e., by adding a section of PVC riser) and fitted with a new protective casing to accommodate future waste disposal activities, as it is located within the active waste area.

- As per the MECP review of the 2023 Annual Monitoring Report (**Appendix A-3**), future monitoring should include VOCs results and analysis for groundwater.

7.3 Surface Water

- Surface water monitoring should continue on a semi-annual basis (spring and fall) for the Hickey Road WDS for the parameters identified in Table 6.
- Dry conditions were observed at all surface water monitoring locations during the October 22, 2025 Site visit, consistent with 2024 observations. Consideration should be given to conducting the fall monitoring event earlier in the season or during late summer to increase the likelihood of obtaining a second sampling event.
- Based on the 2025 surface water chemistry results, there remains insufficient evidence to determine which upstream location (HR-SW1 or HR-SW4) is the more appropriate background monitoring location. As a result, both locations should continue to be used to assess background surface water quality.
- In 2025, no PWQO exceedances were identified at downgradient surface water monitoring locations HR-SW2 and HR-SW3. Isolated PWQO exceedances for aluminum and copper were observed at upstream location HR-SW4.
- Elevated concentrations of select parameters (e.g., sodium, COD, TKN, dissolved aluminum, and manganese) were observed at HR-SW2 and HR-SW3 relative to HR-SW1 during the spring 2025 monitoring event; however, all parameters remained within PWQO. These observations suggest minor influence from the WDS, likely attributable to surface runoff rather than groundwater discharge.
- A Mann-Kendall trend analysis was completed for the first time in 2025. Results indicate decreasing or stable trends for key parameters (e.g., chloride and manganese) at HR-SW1 and HR-SW2, no apparent trends at HR-SW3, and generally stable to decreasing trends at HR-SW4, indicating no increasing trends for surface water impacts over time.

7.4 Trigger Mechanisms and Contingency Plan

- The updated groundwater and surface water Trigger Mechanisms and Contingency Plans were approved through the ECA amendment dated July 19, 2025 (Appendices G-1 and G-2).
- Groundwater trigger assessment points are HR9-21 and HR10-21 (south and west CAZ boundaries) for barium, chloride, iron, and TDS. The 2025 results did not trigger the Tier 1 Contingency Plan.

- Surface water trigger assessment points are HR-SW2 and HR-SW3 for alkalinity, chloride, iron, manganese, TKN, and un-ionized ammonia. The 2025 results did not trigger the Tier 1 Contingency Plan.

7.5 Landfill Gas

- Methane concentrations in 2025 were generally below thresholds of concern for subsurface and on-site structures. Elevated readings at HR6-19 and HR2-03 are located away from structures and do not pose an immediate risk. The attendant's shack and wells near the property boundary remained below concentrations of concern.
- Landfill gas should continue to be monitored during semi-annual monitoring.

7.6 Landfill Capacity

- The remaining volumetric capacity of the landfill at the end of 2025 is estimated to be 28,602 m^3, based on the June 2023 topographical survey and 2025 waste placement.
- Using a five-year average waste generation rate of 301.6 m^3/year (including cover), the life expectancy of the WDS is estimated at 75 years.
- A Closure Plan must be submitted two years prior to the anticipated closure of the Site as required by Condition 9 of the ECA.

8 Limiting Conditions

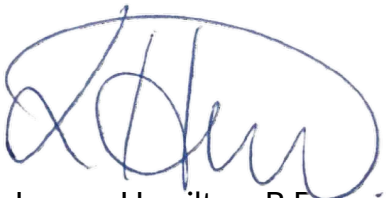
The conclusions presented in this report represent our professional opinion and are based upon the work described in this report and any limiting conditions in the terms of reference, scope of work, or conditions noted herein.

The findings presented in this report are based on conditions observed at the specified dates and locations, the analysis of samples for the specified parameters, and information obtained for this project. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, locations that were not investigated directly, or types of analysis not performed.

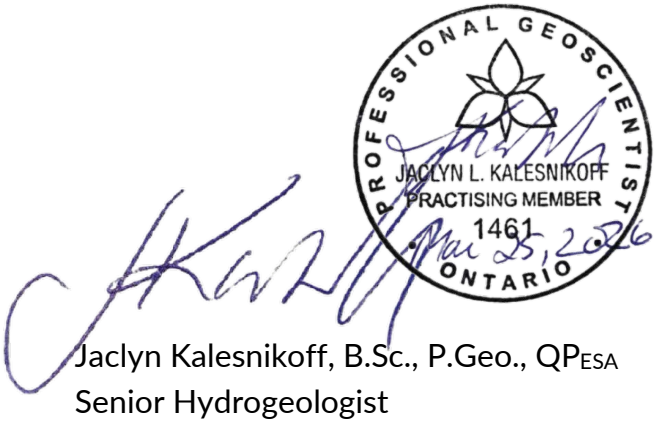
BluMetric Environmental Inc. makes no warranty as to the accuracy or completeness of the information provided by others, or of conclusions and recommendations predicated on the accuracy of that information. This report has been prepared for The Corporation of the Municipality of Hastings Highlands. Any use a third party makes of this report, any reliance on the report, or decisions based upon the report, are the responsibility of those third parties unless

authorization is received from BluMetric Environmental Inc. in writing. BluMetric Environmental Inc. accepts no responsibility for any loss or damages suffered by any unauthorized third party as a result of decisions made or actions taken based on this report.

Respectfully submitted,
BluMetric Environmental Inc.



Lauren Hamilton, B.Eng.
Engineering Intern



Jaclyn Kalesnikoff, B.Sc., P.Geo., QP_{ESA}
Senior Hydrogeologist

9 References

BluMetric, 2025. 2024 *Annual Monitoring Report, Hickey Road WDS, The Corporation of the Township of Hastings Highland*, March 2025.

BluMetric, 2024. 2023 *Annual Monitoring Report, Hickey Road WDS, The Corporation of the Township of Hastings Highland*, March 2024.

BluMetric, 2023. 2022 *Annual Monitoring Report, Hickey Road WDS, The Corporation of the Township of Hastings Highland*, March 2023.

BluMetric, 2022. 2021 *Annual Monitoring Report, Hickey Road WDS, The Corporation of the Township of Hastings Highland*, March 2022.

CCME (Canadian Council of Ministers of the Environment), 2011. *Protocols Manual For Water Quality Sampling in Canada*. 186p. http://www.ccme.ca/files/Resources/water/protocols_document_e_final_101.pdf.

Groundwater Information Network, http://gw-info.net/ February 8, 2016.

Landfill Standards – *A Guideline on the Regulatory and Approval Requirements for New and Expanding Landfill Sites, MOE*, May 1998.

MOE, *Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water Technical Guidance Document*, November 2010.

MOE, *Provincial Water Quality Objectives*, 1999.

MOE, *Ontario Drinking Water Standards Objectives and Guidelines*, June 2002, Amended O.Reg. 457/16, updates effective January 2018.

Ministry of Northern Development and Mines (MNDM). Map 2556, Quaternary Geology of Ontario, Southern Sheet, 1991.

Ministry of Northern Development and Mines (MNDM). Map 2544, Bedrock Geology of Ontario, Southern Sheet, 1991.

Ontario, Map: Well records, King's Printer for Ontario, 2012-24.

Tables

Table 14. Groundwater Chemistry Results - Hickey Road WDS

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR1-03	HR2-03R	HR2-03R	HR-QAQC-GW1 (HR2-03R)	HR3-03	HR3-03	HR4-10	HR4-10	HR5-10	HR-QAQC-GW1 (HR5-10)
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2025-May-07	2025-May-07	2025-Oct-22	2025-Oct-22	2025-May-07	2025-Oct-22	2025-May-07	2025-Oct-22	2025-May-07	2025-May-07
Anions						**Detection Limit**										
Chloride	mg/L	128.75	250	-	-	1	<1	54	78	78	28	10	19	64	44	44
Nitrate as N	mg/L	3.32125	10	-	-	0.1	<0.1	<0.1	<0.1	<0.1	1.26	0.5	<0.1	<0.1	0.29	0.28
Sulphate	mg/L	-	500	-	-	1	9.8	19	5.2	4.4	8.3	4.6	9.8	38	34	34
Cations																
Calcium (diss)	mg/L	-	-	-	-	0.2	15	83	67	69	34	15	56	90	56	56
Magnesium (diss)	mg/L	-	-	-	-	0.05	2.5	13	6.4	6.7	1.7	1.3	9.5	20	5.5	5.4
Potassium (diss)	mg/L	-	-	-	-	0.2	0.71	33	15	15	1.3	1.2	27	57	9	8.8
Sodium (diss)	mg/L	104.495	200	-	-	0.1	1.4	45	28	29	11	8.9	16	110	16	16
General Chemistry																
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	52	360	170	180	70	39	240	600	220	220
Ammonia as N	mg/L	-	-	-	-	0.05	<0.05	13	3.2	3.2	<0.05	0.051	17	45	4	3.9
Chemical Oxygen Demand	mg/L	-	-	-	-	4	37	150	27	24	<4	<4	76	130	30	29
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	1.8	51	11	11	1.9	3	23	55	6.7	7
Electrical Conductivity	uS/cm	-	-	-	-	2	120	930	670	670	270	140	590	1500	650	650
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.14	6.58	6.97	6.91	7.29	7.28	6.94	7.13	7.26	7.21
Total Dissolved Solids	mg/L	314	500	-	-	10	105	555	300	375	195	95	330	710	360	365
Metals																
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.0049	0.014	0.17	0.07	0.071	0.011	<0.0049	0.052	0.044	0.012	0.011
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.027	0.35	0.15	0.15	0.072	0.029	0.61	0.8	0.14	0.14
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	<0.01	0.15	0.08	0.078	0.022	0.018	0.3	0.53	0.18	0.18
Cadmium (diss)	mg/L	0.0012875	0.005	0.2	Calculated	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	<0.0005	0.056	0.0079	0.0078	0.0057	0.00099	0.073	0.059	0.012	0.012
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	<0.0009	0.001	<0.0009	<0.0009	0.0016	0.0013	0.0017	<0.0009	0.0029	0.0028
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.1	<0.1	79	34	34	<0.1	<0.1	61	74	10	9.9
Lead (diss)	mg/L	0.002875	0.01	Calculated	Calculated	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	0.0028	7	3.6	3.4	0.019	<0.002	3.4	2.1	0.95	0.94
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	0.00079	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00079	<0.0005	<0.0005
Nickel (diss)	mg/L	-	-	0.025	-	0.001	<0.001	0.0088	0.0013	0.0015	0.0013	<0.001	0.017	0.015	0.0033	0.0033
Silicon (diss)	mg/L	-	-	-	-	0.05	3.4	3.8	6.5	6.8	2.6	3.6	9.9	9.9	4.7	4.7
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Strontium (diss)	mg/L	-	-	-	-	0.001	0.074	0.42	0.31	0.31	0.093	0.048	0.28	0.51	0.32	0.31
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00011	0.00013
Titanium (diss)	mg/L	-	-	-	-	0.005	<0.005	0.0054	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.0005	0.0077	0.0053	0.0052	<0.0005	<0.0005	0.0035	0.0086	0.00072	0.00073
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	<0.005	0.0066	0.017	0.016	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Table 14. Groundwater Chemistry Results - Hickey Road WDS

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR5-10	HR6-19	HR7-19	HR7-19	HR8-19	HR8-19	HR9-21	HR9-21	HR10-21	HR10-21
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2025-Oct-22	2025-May-07	2025-May-07	2025-Oct-22	2025-May-07	2025-Oct-22	2025-May-07	2025-Oct-22	2025-May-07	2025-Oct-22
Anions						Detection Limit										
Chloride	mg/L	128.75	250	-	-	1	30	1.8	20	30	11	1.3	<1	1.5	3.5	2.2
Nitrate as N	mg/L	3.32125	10	-	-	0.1	<0.1	<0.1	0.57	<0.1	0.17	0.15	0.13	0.45	0.81	0.24
Sulphate	mg/L	-	500	-	-	1	50	28	73	14	8.5	3	4	4.9	3.2	5.6
Cations																
Calcium (diss)	mg/L	-	-	-	-	0.2	120	97	91	76	39	9.6	2.4	3.1	5.4	3.9
Magnesium (diss)	mg/L	-	-	-	-	0.05	12	3.3	9.5	10	4	0.93	0.37	0.48	1	0.73
Potassium (diss)	mg/L	-	-	-	-	0.2	12	3.3	19	30	1.7	0.83	0.64	1.2	1	0.92
Sodium (diss)	mg/L	104.495	200	-	-	0.1	35	4.4	24	45	7.8	1.9	1.1	2	2.5	2.1
General Chemistry																
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	410	260	310	370	110	28	9	8.4	20	12
Ammonia as N	mg/L	-	-	-	-	0.05	-	2.7	16	27	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chemical Oxygen Demand	mg/L	-	-	-	-	4	61	9.3	48	58	5.9	<4	<4	<4	<4	<4
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	22	4.2	17	24	4.6	2	1.4	2.3	1	2
Electrical Conductivity	uS/cm	-	-	-	-	2	960	560	830	860	260	73	28	39	62	44
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.99	7.34	6.91	7.12	7.1	7.17	6.81	6.75	6.93	6.82
Total Dissolved Solids	mg/L	314	500	-	-	10	530	375	490	415	185	40	20	<10	70	70
Metals																
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.0049	0.019	0.012	0.039	0.021	0.0077	<0.0049	0.012	0.012	0.0069	0.023
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.3	0.049	0.47	0.41	0.058	0.0088	0.0065	0.012	0.0052	0.0043
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.24	0.081	0.7	0.53	0.079	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (diss)	mg/L	0.0012875	0.005	0.2	Calculated	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0.036	0.00087	0.027	0.044	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	0.0049	<0.0009	0.0049	0.0013	0.0025	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.1	21	17	24	44	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead (diss)	mg/L	0.002875	0.01	Calculated	Calculated	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	2.3	0.28	1.9	1.9	0.0026	<0.002	0.0034	0.0056	<0.002	<0.002
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.0005	<0.0005	0.00054	0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel (diss)	mg/L	-	-	0.025	-	0.001	0.0056	0.0014	0.008	0.009	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon (diss)	mg/L	-	-	-	-	0.05	6.3	3	6.4	9.1	5.4	4.2	3.7	4.6	3.8	3.9
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Strontium (diss)	mg/L	-	-	-	-	0.001	0.94	0.34	0.43	0.4	0.25	0.058	0.027	0.048	0.056	0.039
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.00005	<0.00005	0.00011	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Titanium (diss)	mg/L	-	-	-	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	0.0016	<0.0005	0.0015	0.004	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

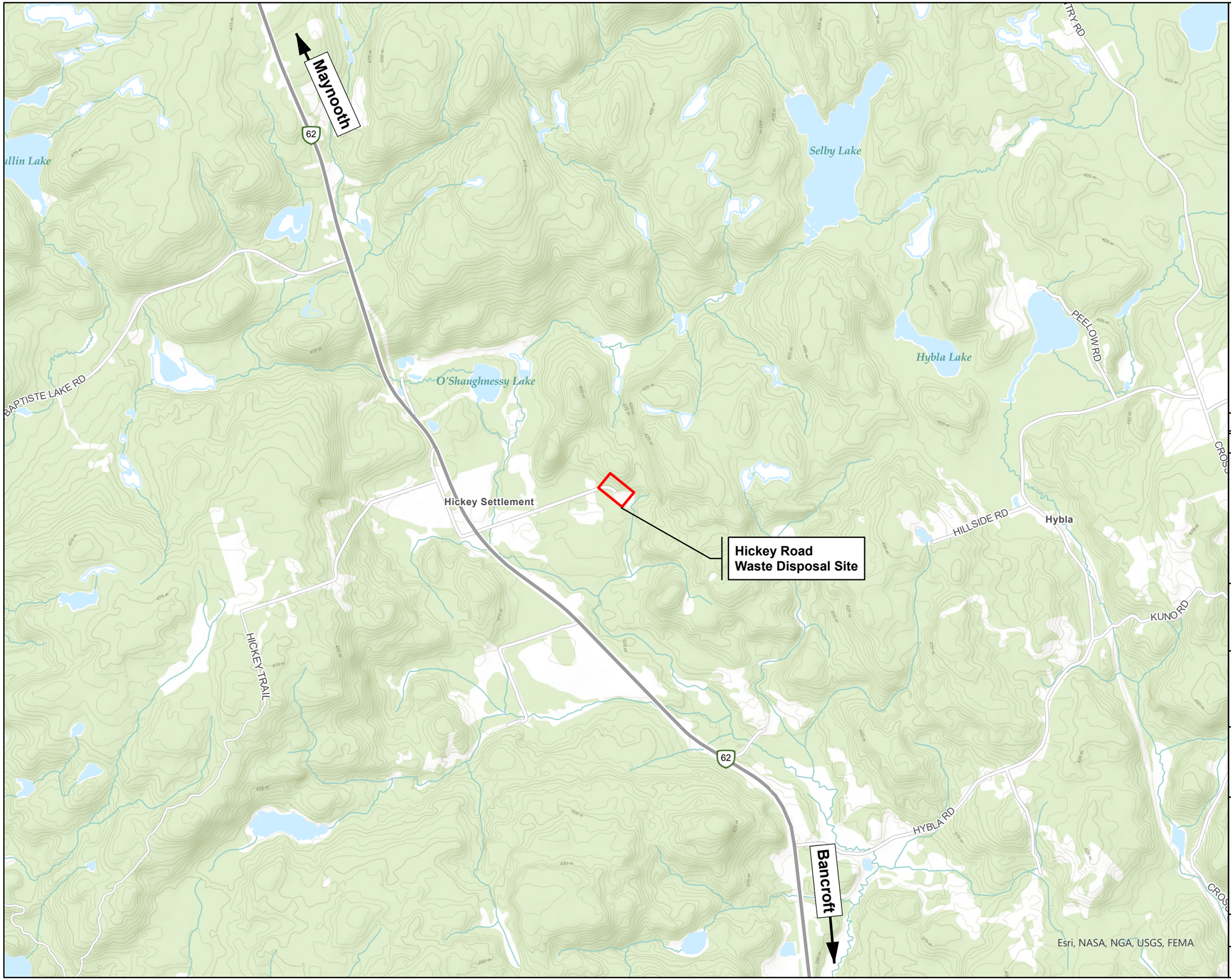
Table 15. 2025 Surface Water Chemistry Results - Hickey Road WDS

Hastings Highlands Analytical Chemistry Results: Anions, Cations, FPs, GenChem, Met in Surface Water						Sample ID	HR-SW1	HR-SW2	HR-QAQC-SW1 (HR-SW2)	HR-SW3	HR-SW4
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample Date	2025-May-07	2025-May-07	2025-May-07	2025-May-07	2025-May-07
Anions						Detection Limit					
Chloride	mg/L	-	-	180	128	1	<1	<1	<1	<1	<1
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	0.32	<0.1	<0.1	<0.1	<0.1
Nitrate as N	mg/L	-	-	-	-	0.1	0.32	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulphate	mg/L	-	-	100	-	1	5.4	4.1	4.3	4	4.3
Cations											
Calcium (tot)	mg/L	-	-	-	-	0.2	15	8.7	8.8	7.6	3.2
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.3	1	1	0.91	1
Potassium (tot)	mg/L	-	-	-	-	0.2	0.74	0.72	0.68	0.56	0.91
Sodium (tot)	mg/L	-	-	-	-	0.1	0.93	0.97	0.95	1.1	1.1
Field Parameters											
pH (Field)	pH units	-	-	-	-		7.2	6.73	6.73	6.79	6.24
Temperature	deg. C	-	-	-	-		9.9	12	12	12.1	6.9
General Chemistry											
Alkalinity (as CaCO3)	mg/L	Calculated	-	-	-	1	49	24	24	17	8.2
Ammonia as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	<4	7.3	6.6	11	5.2
Electrical Conductivity	uS/cm	-	-	-	-	2	91	60	60	54	34
Hardness (as CaCO3)	mg/L	-	-	-	-	1	41	27	26	23	12
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.52	7.17	7.22	6.98	6.66
Total Dissolved Solids	mg/L	-	-	-	-	10	100	45	35	80	35
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.12	0.19	0.21	0.22	0.16
Total Phosphorus	mg/L	0.03	-	-	-	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	10
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061
Metals											
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.005	0.022	0.05	0.053	0.072	0.079
Barium (tot)	mg/L	-	-	2.3	-	0.002	0.013	0.013	0.013	0.012	0.012
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.0017	0.0014	0.0014	0.0013	0.0021
Iron (tot)	mg/L	0.3	-	1	-	0.1	<0.1	<0.1	<0.1	<0.1	0.29
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (tot)	mg/L	-	-	-	-	0.002	0.002	0.0021	<0.002	0.0034	0.015
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Figures



LEGEND

Waste Disposal Site

NOTE: THE ONLY WELL RECORDS AVAILABLE WITHIN 500 m OF THE SITE ARE MONITORING WELLS.

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC.
DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 500 1,000 Meters

CLIENT

Municipality of Hastings Highlands

PROJECT

Hickey Road
Waste Disposal Site

TITLE

Site Location Map

BluMetric Environmental

The Tower - The Woolen Mill,
4 Cataraqui St.,
Kingston, Ontario K7K 1Z7
TEL: (613) 531-2725
FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
250253-05	February 19, 2026

DRAWN	CHECKED	FIG NO.	REV
PB	LH	01	0



SW4 is located NE of the Site.

LEGEND

- Groundwater Monitoring Location
- Benchmark
- Surface Water Sampling Locations
- GPS Coordinates
- Site Features
- Surveyed Boundary (4.0 ha) (PA Miller, 2018)
- Surveyed CAZ (1.12 ha) (PA Miller, 2018)

NOTES:
- Site Property Boundary: 4.0 ha
- Ortho Image taken by a UAV flight in 2017
- UTM zone used is CSRS 18

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC.
DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 25 50 Meters

1:1,500

CLIENT

Municipality of Hastings Highlands

PROJECT

Hickey Road
Waste Disposal Site

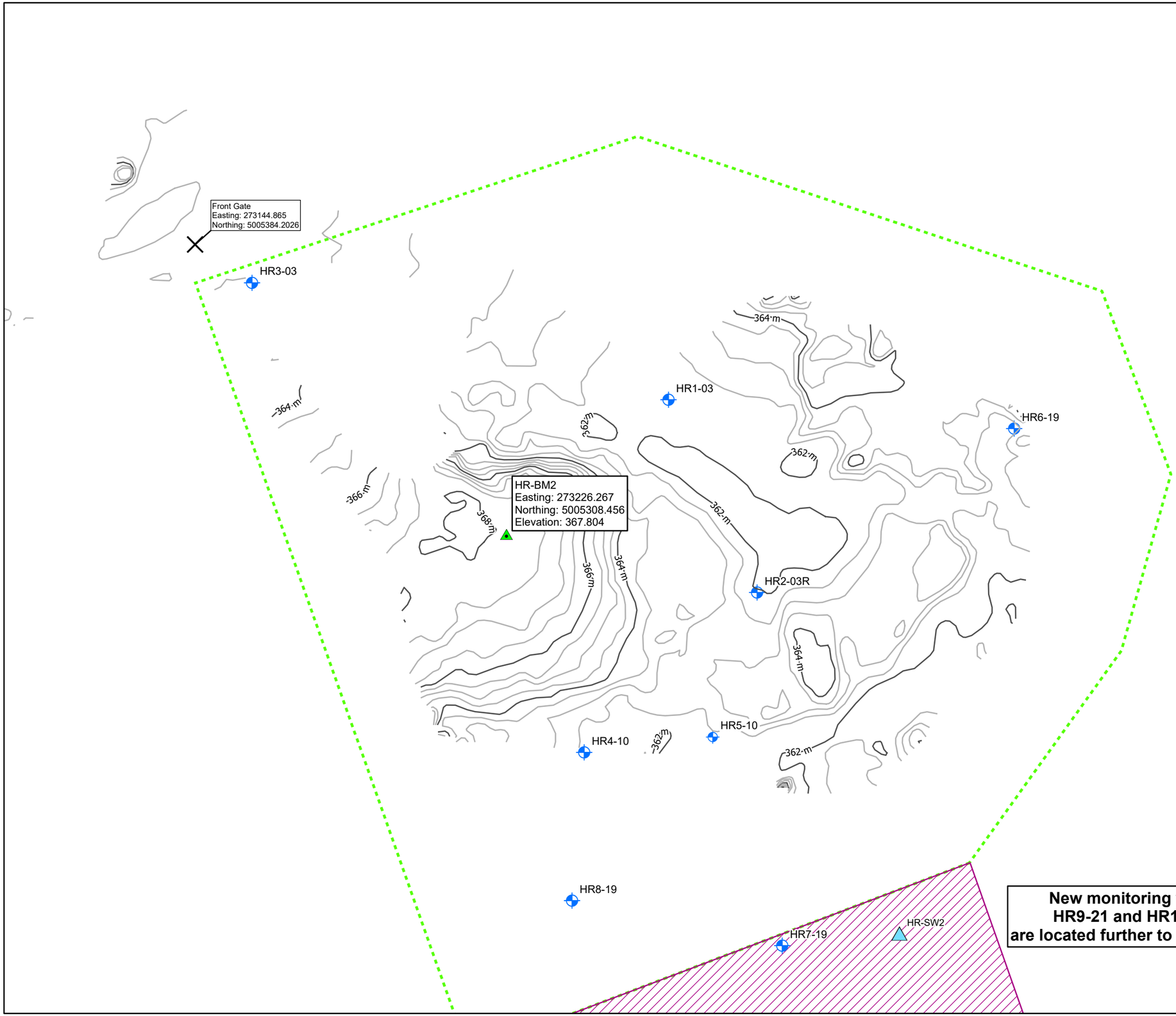
TITLE

Site Plan

BluMetric Environmental
The Tower - The Woolen Mill,
4 Cataraqui St.,
Kingston, Ontario K7K 1Z7
TEL: (613) 531-2725
FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
250253-05	February 19, 2026

DRAWN	CHECKED	FIG NO.	REV
PB	LH	02	0



LEGEND

- Groundwater Monitoring Location
- Benchmark
- Surface Water Sampling Locations
- GPS Coordinates
- Surveyed Boundary (4.0 ha) (PA Miller, 2018)
- Surveyed CAZ (1.12 ha) (PA Miller, 2018)

2023 Elevation

- Minor Contour (0.5 masl)
- Major Contour (2.0 masl)

NOTES:
- Site Property Boundary: 4.0 ha
- All well and benchmark elevation data based on 2019 data, except for HR5-10, which is based on 2016 Survey

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC.
DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 20 40 Meters

1:1,000

CLIENT

Municipality of Hastings Highlands

PROJECT

Hickey Road
Waste Disposal Site

TITLE

Site Topography and Monitoring Locations

BluMetric Environmental
The Tower - The Woolen Mill,
4 Cataraqui St.,
Kingston, Ontario K7K 1Z7
TEL: (613) 531-2725
FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
250253-05	February 19, 2026

DRAWN	CHECKED	FIG NO.	REV
PB	LH	03	0



LEGEND

- Groundwater Monitoring Location
- Benchmark
- Surface Water Sampling Locations
- GPS Coordinates
- Site Features
- Surveyed Boundary (4.0 ha) (PA Miller, 2018)
- Surveyed CAZ (1.12 ha) (PA Miller, 2018)
- Groundwater Contour (masl)
- Inferred Direction of Groundwater Flow

NOTES:
- Site Property Boundary: 4.0 ha
- All well Elevation Data Based on 2021 Survey Data
- Ortho Image taken by a UAV flight in 2017
- UTM zone used is CSRS 18

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 25 50 Meters

1:1,500

CLIENT

Municipality of Hastings Highlands

PROJECT

Hickey Road
Waste Disposal Site

TITLE

Monitoring Locations and Water Levels - Spring 2025

BluMetric Environmental

The Tower - The Woolen Mill,
4 Cataraqui St.,
Kingston, Ontario K7K 1Z7
TEL: (613) 531-2725
FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
250253-05	February 19, 2026

DRAWN	CHECKED	FIG NO.	REV
EB	LH	04	0



LEGEND

- Groundwater Monitoring Location
- Benchmark
- Surface Water Sampling Locations
- GPS Coordinates
- Site Features
- Surveyed Boundary (4.0 ha) (PA Miller, 2018)
- Surveyed CAZ (1.12 ha) (PA Miller, 2018)
- Groundwater Contour (masl)
- Inferred Direction of Groundwater Flow

NOTES:
- Site Property Boundary: 4.0 ha
- All well Elevation Data Based on 2021 Survey Data
- Ortho Image taken by a UAV flight in 2023
- UTM zone used is CSRS 18

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC.
DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N
W E
S

0 25 50 Meters

1:1,500

CLIENT

Municipality of Hastings Highlands

PROJECT

Hickey Road
Waste Disposal Site

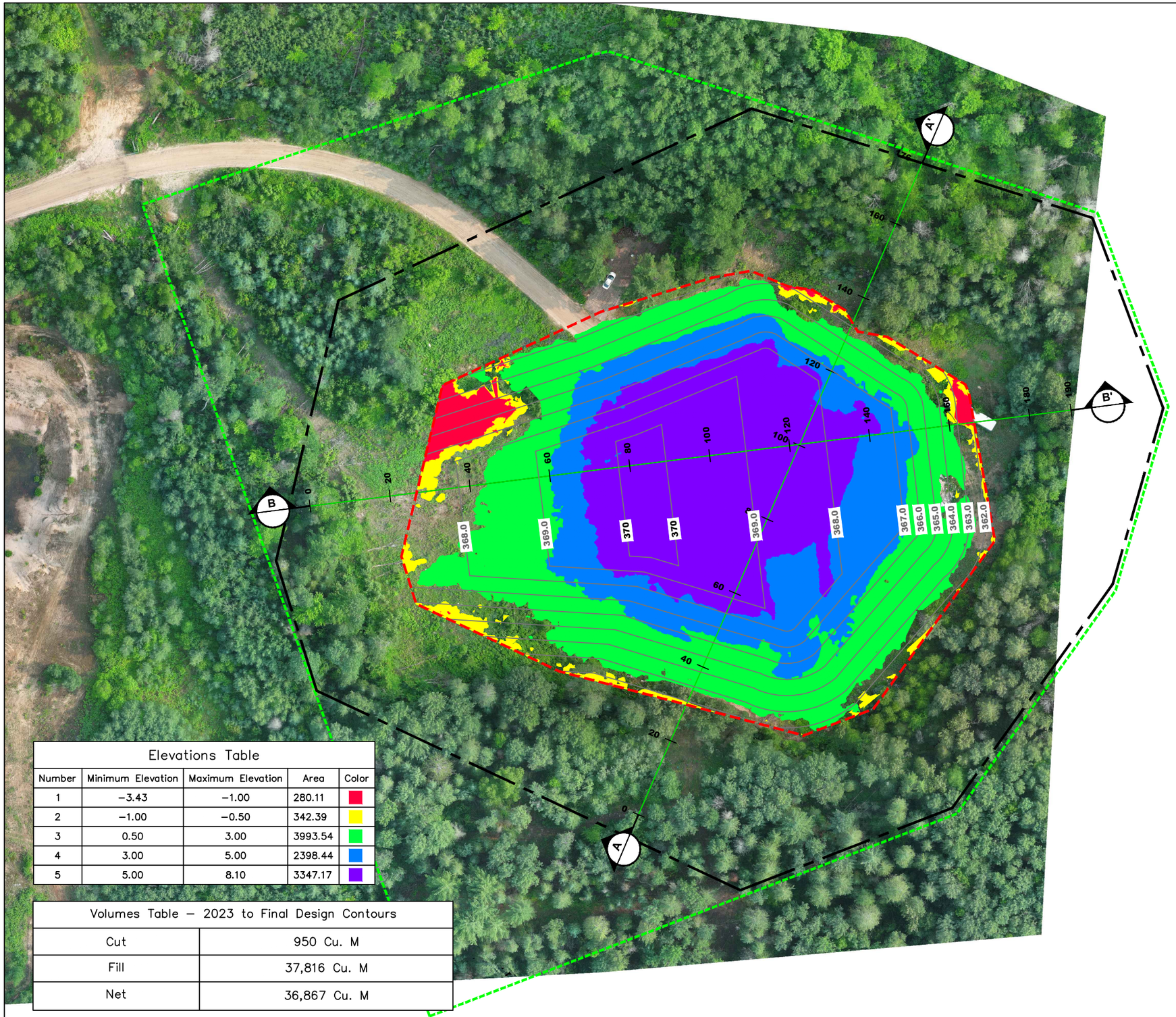
TITLE

Monitoring Locations and Water Levels - Fall 2025

BluMetric Environmental
The Tower - The Woolen Mill,
4 Cataraqui St.,
Kingston, Ontario K7K 1Z7
TEL: (613) 531-2725
FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
250253-05	February 19, 2026

DRAWN	CHECKED	FIG NO.	REV
EB	LH	05	0



Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	−3.43	−1.00	280.11	
2	−1.00	−0.50	342.39	
3	0.50	3.00	3993.54	
4	3.00	5.00	2398.44	
5	5.00	8.10	3347.17	

Volumes Table – 2023 to Final Design Contours	
Cut	950 Cu. M
Fill	37,816 Cu. M
Net	36,867 Cu. M

LEGEND

110 **FINAL DESIGN CONTOURS (1.0 m)**

FINAL FOOTPRINT DESIGN

MINIMUM 30m BUFFER AROUND WASTE

APPROXIMATE LOCATION OF PROPERTY BOUNDARY

NOTE: VOLUME OF 600 mm CAP TO COVER THE SURFACE OF THE WASTE SITE IS 7293.01 CUBIC METRES. FINAL DESIGN CONTOURS ARE TO TOP OF CAP / UNDERSIDE OF TOP SOIL.

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

0 25 50 Meters 1:1000

N W E S

THIS SCALE TO BE USED TO OBTAIN APPROXIMATE DIMENSIONS FOR INFORMATION

CLIENT

Municipality of Hastings Highlands

PROJECT

Hickey Road Waste Disposal Site

TITLE

Remaining Fill Capacity as of June 2023

BluMetric Environmental

The Tower - The Woolen Mill
4 Cataraqui Street,
Kingston, Ontario, K7K 1Z7
TEL: (613) 531-2725
FAX: (613) 531-1852
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
250253-05	2026-02-19

DRAWN	CHECKED	DWG NO.	REV
PB	LH	06	0

C:\SP\BluMetric Environmental\Geomatics - GIS\GIS_PROJECTS\PROJECTS\MHH\Projects\250253 - 2025 AMR\05-Hickey Road\CAD\2025-02-11\240205-05_Hickey_DandO_V03.dwg

Site Photographs



Photo 1: Front Signage – May 7, 2025



Photo 2: Front Signage & Secure Gate – May 7, 2025



Photo 3: Recycling Collection Bins – May 7, 2025



Photo 4: Attendant shack and electronics collection bin – May 7, 2025



Photo 5: Scrap Metal Pile – May 7, 2025



Photo 6: Bulk Waste Storage Pile – May 7, 2025



Photo 7: Vehicle Turnaround Area facing NW – May 7, 2025



Photo 8: Vehicle Turnaround Area facing SE – May 7, 2025



Photo 9: Active Waste Area – May 7, 2025



Photo 10: Active Waste Area – May 7, 2025



Photo 11: Surface Water Location – HR-SW1 – May 7, 2025



Photo 12: Surface Water Location- HR-SW2 – May 7, 2025



Photo 13: Surface Water Location – HR-SW3 – May 7, 2025



Photo 14: Surface Water Location – HR-SW4 – May 7, 2025



Photo 15: Front Signage – October 22, 2025



Photo 16: Front Signage & Secure Gate – October 22, 2025



Photo 17: Recycling Collection Bins – October 22, 2025



Photo 18: Attendant shack – October 22, 2025



Photo 19: Scrap Metal Pile – October 22, 2025



Photo 20: Bulk Waste Storage Pile – October 22, 2025



Photo 21: Vehicle turnaround area facing N – October 22, 2025



Photo 22: Vehicle turnaround facing SW– October 22, 2025



Photo 23: Active Waste Area – October 22, 2025



Photo 24: Active Waste Area – October 22, 2025



Photo 25: Surface Water Location – HR-SW1 – October 22, 2025



Photo 26: Surface Water Location- HR-SW2 – October 22, 2025



Photo 27: Surface Water Location – HR-SW3 – October 22, 2025



Photo 28: Surface Water Location – HR-SW4 – October 22, 2025

Appendix A

Environmental Compliance Approvals

Appendix A

A-1 Amended Environmental Compliance Approval – July 2025

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A362301
Issue Date: July 19, 2025

The Corporation of the Municipality of Hastings Highlands
33011 Highway 62
Post Office Box, No. 130
Maynooth, Ontario
K0L 2S0

Site Location: Hickey Road WDS
202 Hickey Rd Pt. Lot 30, Con. 8, former Monteagle Twp.
Hastings Highlands Municipality, County of Hastings

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the use and operation of 3.0 hectare waste disposal/transfer site within a total site area of 4.0 hectares.

For the purpose of this environmental compliance approval, the following definitions apply:

"Approval" means this Environmental Compliance Approval and any Schedules to it;

"Batteries" within the context of this Approval, mean discarded devices in which energy was stored as electricity or converted into electricity and was used as a source of power and include Batteries as defined in O. Regulation 30/20;

"Blue Box Waste" within the context of this Approval, means:

a. each of the categories set out in Schedule 1 of O. Regulation 101/94 (entitled "Blue Box Waste"), including Part I ("Basic Blue Box Waste") and Part II ("Supplementary Blue Box Waste") of O. Regulation 101/94; and

b. discarded Blue Box Materials, as defined in O. Regulation 391/21;

"Contaminating Life Span" means contaminating life span as defined in Ontario Regulation 232/98;

“Director” means any Ministry employee appointed in writing by the Minister pursuant to section 5 of the EPA as a Director for the purposes of Part II.1 of the EPA;

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

"EEE" within the context of this Approval, means electrical and electronic equipment as defined in O. Regulation 522/20, the equipment subject to requirements of O. Regulation 522/20 and the equipment listed in O. Regulation 522/20 but exempted from the requirements of O. Regulation 522/20;

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

"Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

“NMA” means the *Nutrient Management Act, 2002,* S.O. 2002, c. 4, as amended;

“O. Reg. 101/94” means Ontario Regulation 101: (Recycling and Composting of Municipal Waste), made under the EPA, as amended;

“O. Reg. 232/98” means Ontario Regulation 232/98: (Landfilling Sites), made under the EPA, as amended;

"O. Regulation 30/20" means Ontario Regulation 30/20: Batteries, made under the Resource Recovery and Circular Economy Act, as amended;

"O. Regulation 387/16" means Ontario Regulation 387/16: Municipal Hazardous or Special Waste, made under the Waste Diversion Transition Act, as amended;

"O. Regulation 389/16" means Ontario Regulation 389/16: Waste Electrical and Electronic Equipment, made under the Waste Diversion Transition Act, as amended;

"O. Regulation 391/21" means O. Reg. 391/21: Blue Box, made under the Resource Recovery and Circular Economy Act, as amended;

"O. Reg. 463/10" means Ontario Regulation 463/10 (Ozone Depleting Substances and Other Halocarbons), made under the EPA, as amended;

"O. Regulation 522/20" means Ontario Regulation 522/20: Electrical and Electronic Equipment, made under the Resource Recovery and Circular Economy Act, as amended;

“Ontario Drinking Water Quality Standards” means Ontario Regulation 169/03 (Ontario Drinking Water Quality Standards), made under the SDWA, as amended;

“Operator” means any person, other than the Owner's employees, authorized by the Owner as having the

charge, management or control of any aspect of the Site and includes its successors or assigns;

“Owner” means any person that is responsible for the establishment or operation of the Site being approved by this Approval, and includes the Corporation of the Municipality of Hastings Highlands and its successors and assigns;

"OWRA" means the *Ontario Water Resources Act,* R.S.O. 1990, c. O.40, as amended;

“PA” means the *Pesticides Act,* R.S.O. (1990), c. P.11, as amended;

“Provincial Officer” means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the OWRA, Section 5 of the EPA, Section 17 of the PA, Section 4 of the NMA, or Section 8 of the SDWA;

“Regional Director” means the Regional Director of the local Regional Office of the Ministry in which the Site is located;

“Reg. 347” means R.R.O. 1990, Reg. 347: (General - Waste Management), made under the EPA, as amended;

“Reg. 903” means R.R.O. 1990, Reg. 903: (Wells), made under the OWRA, as amended;

"Resource Recovery and Circular Economy Act" means the *Resource Recovery and Circular Economy Act,* 2016, S.O. 2016, c. 12, Sched. 1, as amended;

“SDWA” means the *Safe Drinking Water Act, 2002* , S.O. 2002, c. 32, as amended;

"Schedules" means the following schedules attached to this Approval and forming part of this Approval namely:

- Schedule 1 - Supporting Documentation; and
- Schedule 2 - Surface Water and Groundwater Monitoring Program;

“Site” means the entire waste disposal site, including the buffer lands, and contaminant attenuation zone at 202 Hickey Road, Municipality of Hastings Highlands, County of Hastings;

“Trained Personnel” means personnel knowledgeable in the following through instruction and/or practice:

- relevant waste management legislation, regulations and guidelines;
- major environmental concerns pertaining to the waste to be handled;
- occupational health and safety concerns pertaining to the processes and wastes to be handled;
- management procedures including the use and operation of equipment for the processes and wastes to be handled;
- emergency response procedures;
- specific written procedures for the control of nuisance conditions;

- o specific written procedures for refusal of unacceptable waste loads; and
- o the requirements of this Approval; and

"Waste Diversion Transition Act" means the *Waste Diversion Transition Act,* 2016, S.O. 2016, c. 12, Sched. 2, as amended;

"WEEE" within the context of this Approval, means waste electrical and electronic equipment consisting of devices that required an electric current to operate. WEEE is limited to the following:

a. the devices listed in O. Regulation 389/16; and
b. discarded devices originating/derived from the EEE;

"White Goods Containing Refrigerants" means the White Goods which contain, or may contain refrigerants; and

"White Goods" means the white goods (appliances) with or without the refrigerants.

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

TERMS AND CONDITIONS

1. GENERAL

Compliance

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

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

In Accordance

3. Except as otherwise provided by this Approval, the Site shall be designed, developed, built, operated and maintained in accordance with the documentation listed in the attached Schedule 1.

Interpretation

4. Where there is a conflict between a provision of any document listed in Schedule 1 in this Approval, and the conditions of this Approval, the conditions in this Approval shall take

precedence.

5. Where there is a conflict between the application and a provision in any document listed in Schedule 1, the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the Ministry approved the amendment.

6. Where there is a conflict between any two documents listed in Schedule 1, the document bearing the most recent date shall take precedence.

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

Other Legal Obligations

8. The issuance of, and compliance with, this Approval does not:
   a. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
   b. limit in any way the authority of the Ministry to require certain steps be taken or to require the Owner and Operator to furnish any further information related to compliance with this Approval.

Adverse Effect

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

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

Change of Ownership

11. The Owner shall notify the Director, in writing, and forward a copy of the notification to the District Manager, within 30 days of the occurrence of any changes in the following information:
   a. the ownership of the Site;
   b. the Operator of the Site;
   c. the address of the Owner or Operator; and

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

12. No portion of this Site shall be transferred or encumbered prior to or after closing of the Site unless the Director is notified in advance and sufficient financial assurance is deposited with the Ministry to ensure that these conditions will be carried out.

13. In the event of any change in ownership of the Site, other than change to a successor municipality, the Owner shall notify the successor of and provide the successor with a copy of this Approval, and the Owner shall provide a copy of the notification to the District Manager and the Director.

Registration on Title Requirement

14. Prior to dealing with the property in any way, the Owner shall provide a copy of this Approval and any amendments, to any person who will acquire an interest in the property as a result of the dealing.

15. a. Within thirty (30) calendar days from the date of issuance of this Approval, the Owner shall submit to the Director a completed Certificate of Requirement which shall include:
    i. a plan of survey prepared, signed and sealed by an Ontario Land Surveyor, which shows the area of the Site where waste has been or is to be deposited at the Site;
    ii. proof of ownership of the Site;
    iii. a letter signed by a member of the Law Society of Upper Canada or other qualified legal practitioner acceptable to the Director, verifying the legal description provided in the Certificate of Requirement;
    iv. the legal abstract of the property; and
    v. any supporting documents including a registerable description of the Site.

    b. Within fifteen (15) calendar days of receiving a Certificate of Requirement authorized by the Director, the Owner shall:
    i. register the Certificate of Requirement in the appropriate Land Registry Office on the title to the property; and
    ii. submit to the Director and the District Manager, written verification that the Certificate of Requirement has been registered on title.

Registration on Title Requirement - Contaminant Attenuation Zone (CAZ)

16. Within thirty (30) calendar days from the date of establishing a contaminant attenuation zone (CAZ) (overburden and/or bedrock aquifers) in either fee simple or by way of a groundwater easement, the Owner shall submit to the Director a completed Certificate of Requirement which shall include:

a. If rights are obtained in fee simple, the Owner shall provide:
    i. documentation evidencing ownership of the CAZ obtained in compliance with O.Reg. 232/98, as amended;
    ii. a completed Certificate of Requirement and supporting documents containing a registerable description of the CAZ; and
    iii. a letter signed by a member of the Law Society of Upper Canada; or other qualified legal practitioner acceptable to the Director, verifying the legal description of the CAZ.

b. within fifteen (15) calendar days of receiving a Certificate of Requirement signed or authorized by the Director,the Owner shall:
    i. Register the Certificate of Requirement in the appropriate Land Registry Office on the title to the property; and
    ii. submit to the Director and the District Manager, written verification that the Certificate of Requirement has been registered on title.

a. If rights are obtained by way of a groundwater easement, the Applicant shall:
    i. provide a copy of the easement;
    ii. provide a plan of survey signed and sealed by an Ontario Land Surveyor for the CAZ;
    iii. submit proof of registration on title of the groundwater easement to the Director;

c. The Owner shall not amend or remove or consent to the removal of the easement or CAZ from title without the prior written consent of the Director.

Inspections by the Ministry

17. No person shall hinder or obstruct a Provincial Officer from carrying out any and all inspections authorized by the OWRA, the EPA, the PA, the SDWA or the NMA, of any place to which this Approval relates, and without limiting the foregoing:
    a. to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this Approval are kept;
    b. to have access to, inspect, and copy any records required to be kept by the conditions of this Approval;
    c. to inspect the Site, related equipment and appurtenances;
    d. to inspect the practices, procedures, or operations required by the conditions of this Approval; and
    e. to sample and monitor for the purposes of assessing compliance with the terms and conditions of this Approval or the EPA, the OWRA, the PA, the SDWA or the NMA.

Information and Record Retention

18. a. Except as authorized in writing by the Director, all records required by this

Approval shall be retained at the Site for a minimum of two (2) years from their date of creation.

b. The Owner shall retain all documentation listed in Schedule 1 for as long as this Approval is valid.

c. All monthly summary reports of waste records collected are to be kept at the Site until they are included in the Annual Report.

d. The Owner shall retain employee training records as long as the employee is working at the Site.

e. The Owner shall make all of the above documents available for inspection upon request of Ministry staff.

19. The receipt of any information by the Ministry or the failure of the Ministry to prosecute any person or to require any person to take any action under this Approval or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:
    a. an approval, waiver, or justification by the Ministry of any act or omission of any person that contravenes any term or condition of this Approval or any statute, regulation or other legal requirement; or
    b. acceptance by the Ministry of the information's completeness or accuracy.

20. The Owner shall ensure that a copy of this Approval, in its entirety and including all its Notices of Amendment, and documentation listed in Schedule 1, are retained at the Site at all times.

21. Any information related to this Approval and contained in Ministry files may be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, RSO 1990, CF-31.

2. SITE OPERATION

Operation

1. The Site shall be operated and maintained at all times including management and disposal of all waste, in accordance with the EPA, Reg. 347, and the conditions of this Approval. At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

Signs

2. The Owner shall install and maintain a sign at the entrance to the Site. The sign shall be

visible and readable from the main road leading to the Site. The following information shall be included on the sign:

a. the name of the Site and Owner;

b. the number of the Approval;

c. the name of the Operator;

d. the normal hours of operation;

e. the allowable and prohibited waste types;

f. the telephone number to which complaints may be directed;

g. a warning against unauthorized access;

h. a twenty-four (24) hour emergency telephone number (if different from above); and

i. a warning against dumping outside the Site.

3. The Owner shall install and maintain signs to direct vehicles to working face and recycling areas.

4. The Owner shall provide signs at recycling depot informing users what materials are acceptable and directing users to appropriate storage areas.

Vermin, Vectors, Dust, Litter, Odour, Noise and Traffic

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

Burning Waste Prohibited

6. a. Burning of waste at the Site is prohibited.

b. Notwithstanding condition 2.6.a above, burning of segregated, clean wood and brush at the landfill may be carried out in strict compliance with the Ministry of the Environment Document titled "Guideline C-7, Burning at Landfill Sites" dated April 1994.

Site Access

7. Waste shall only be accepted during the following time periods:

Summer (Victoria Day to Thanksgiving)
Tuesday and Friday :12:00 p.m. - 5:00 p.m.

Winter (Thanksgiving to Victoria Day)
Friday :12:00 p.m. - 5:00 p.m.

8. On-site equipment used for site preparation and closing activities may be operated between 7 a.m. and 5 p.m. Monday to Friday.

9. With the prior written approval from the District Manager, the time periods may be extended to accommodate seasonal or unusual quantities of waste.

10. Waste/recyclables may be relocated on-site or removed off-site by registered/licensed waste haulers during the hours of 7 a.m. and 5 p.m. Monday to Friday. These activities shall only be carried out by trained personnel of registered/licensed waste haulers.

Site Security

11. No waste shall be received, landfilled or removed from the Site unless a site supervisor or an attendant is present and supervises the operations during operating hours. The Site shall be closed when a site attendant is not present to supervise landfilling operations.

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

3. EMPLOYEE TRAINING

1. A training plan for all employees that operate any aspect of the Site shall be developed and implemented by the Owner or the Operator. Only Trained Personnel shall operate any aspect of the Site or carry out any activity required under this Approval.

4. COMPLAINTS RESPONSE PROCEDURE

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

    a. The Owner shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint,

the name, address and the telephone number of the complainant if the complainant will provide this information and the time and date of the complaint;

b. The Owner, upon notification of the complaint, shall initiate appropriate steps to determine possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and

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

5. EMERGENCY RESPONSE

1. All Spills as defined in the EPA shall be immediately reported to the **Ministry's Spills Action Centre at 1-800-268-6060** and shall be recorded in the log book as to the nature of the emergency situation, and the action taken for clean-up, correction and prevention of future occurrences.

2. In addition, the Owner shall submit, to the District Manager a written report within three (3) business days of the emergency situation, outlining the nature of the incident, remedial measures taken, handling of waste generated as a result of the emergency situation and the measures taken to prevent future occurrences at the Site.

3. All wastes resulting from an emergency situation shall be managed and disposed of in accordance with Reg. 347.

4. All equipment and materials required to handle the emergency situations shall be:
   a. kept on hand at all times that waste landfilling and/or handling is undertaken at the Site; and
   b. adequately maintained and kept in good repair.

5. The Owner shall ensure that the emergency response personnel are familiar with the use of such equipment and its location(s).

6. INSPECTIONS, RECORD KEEPING AND REPORTING

Daily Log Book

1. A daily log shall be maintained in written or electronic format and shall include the following information:
   a. the type, date and time of arrival, hauler, and quantity (tonnes) of all waste and cover material received at the Site;
   b. the area of the Site in which waste disposal operations are taking place;
   c. a record of litter collection activities and the application of any dust suppressants;
   d. a record of the daily inspections; and
   e. a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service.

2. Any information requested by the Director or a Provincial Officer concerning the Site and its operation under this Approval, including but not limited to any records required to be kept by this Approval shall be provided to the Ministry, upon request.

Daily Inspections and Log Book

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

4. A record of the inspections shall be kept in a daily log book that includes:
   a. the name and signature of person that conducted the inspection;
   b. the date and time of the inspection;
   c. the list of any deficiencies discovered;
   d. the recommendations for remedial action; and
   e. the date, time and description of actions taken.

5. A record shall be kept in the daily log book of all refusals of waste shipments, the reason(s) for refusal, and the origin of the waste, if known.

Annual Report

6. A written report on the development, operation and monitoring of the Site, shall be

completed annually (Annual Report). The Annual Report shall be submitted to the District Manager, by March 31st of the year following the period being reported upon.

7. The Annual Report shall include but not be limited to the following information:

   a. the results and an interpretive analysis of the results of all leachate, groundwater, surface water and landfill gas monitoring, including an assessment of the need to amend the monitoring programs;
   b. an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the Site, and the adequacy of and need to implement the contingency plans;
   c. site plans showing the existing contours of the Site; areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; facilities existing, added or removed during the reporting period; and site preparations and facilities planned for installation during the next reporting period;
   d. calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the Site during the reporting period and a calculation of the total volume of Site capacity used during the reporting period;
   e. a calculation of the remaining capacity of the Site and an estimate of the remaining Site life;
   f. a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the Site and recyclables transferred from the Site;
   g. a summary of any complaints received and the responses made;
   h. a discussion of any operational problems encountered at the Site and corrective action taken;
   i. any changes to the Design and Operations Report and the Closure Plan that have been approved by the Director since the last Annual Report;
   j. a report on the status of all monitoring wells and a statement as to compliance with Reg. 903; and
   k. any other information with respect to the Site which the District Manager may require from time to time.

7. LANDFILL DESIGN AND DEVELOPMENT

Approved Waste Types

1. Only municipal waste as defined under Reg. 347 being solid non-hazardous shall be accepted at the Site for landfilling.

2. The Owner shall develop and implement a program to inspect waste to ensure that the waste received at the Site is of a type approved for acceptance under this Approval.

3. The Owner shall ensure that all loads of waste are properly inspected by Trained personnel prior to acceptance at the Site and that the waste vehicles are directed to the appropriate areas for disposal or transfer of the waste. The Owner shall notify the District Manager, in writing, of load rejections at the Site within one (1) business day from their occurrence.

Capacity

4. Maximum volumetric capacity approved for the Site, consisting of the waste, daily cover and intermediate cover, but excluding the final cover is 74,100 cubic meters. This volume includes the historical waste volume of 32,300 cubic meters as of 2016.

5. This approval is for the design, operation and use of 41,800 cubic meters of the calculated theoretical maximum volumetric capacity of the Site as described in documents in Schedule 1.

Service Area

6. Only waste that is generated within the boundaries of the Municipality of Hastings Highlands may be accepted at the Site.

Cover

7. Alternative materials to soil may be used as weekly and interim cover material, based on an application with supporting information and applicable fee for a trial use or permanent use, submitted by the Owner to the Director, copied to the District Manager and as approved by the Director via an amendment to this Approval. The alternative material shall be non-hazardous according to Reg. 347 and will be expected to perform at least as well as soil in relation to the following functions:
    a. Control of blowing litter, odours, dust, landfill gas, gulls, vectors, vermin and fires;
    b. Provision for an aesthetic condition of the landfill during the active life of the Site;
    c. Provision for vehicle access to the active tipping face; and
    d. Compatibility with the design of the Site for groundwater protection, leachate management and landfill gas management.

8. Cover material shall be applied as follows:
    a. **Weekly** Cover - Weather permitting, deposited waste shall be covered **weekly** in a manner acceptable to the District Manager so that no waste is exposed to the atmosphere;
    b. Intermediate Cover - In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 millimetre of soil cover

or an approved thickness of alternative cover material shall be placed; and

c. Final Cover - In areas where landfilling has been completed to final contours, a minimum 600 millimetre thick layer of soil of medium permeability and 150 millimetres of top soil (vegetative cover) shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

9. Approved wastes from Universal Seal Incorporated shall be placed in an excavation in an area remote from burning areas and covered with clean earth fill immediately

10. When frozen ground conditions do not permit excavation, all approved wastes from Universal Seal Incorporated may be disposed on in trenches prepared ahead of time and cover immediately.

11. No waste from Universal Seal Incorporated shall be burned.

8. LANDFILL MONITORING

Landfill Gas

1. The Owner shall ensure that any buildings or structures at the Site contain adequate ventilation systems to relieve any possible landfill gas accumulation to prevent methane concentration reaching the levels within its explosive range. Routine monitoring for explosive methane gas levels shall be conducted in all buildings or structures at the Site, especially enclosed structures which at times are occupied by people.

Compliance

2. The Site shall be operated in such a way as to ensure compliance with the following:

   a. Reasonable Use Guideline B-7 for the protection of the groundwater at the Site; and

   b. Provincial Water Quality Objectives included in the July 1994 publication entitled Water Management Policies, Guidelines, Provincial Water Quality Objectives, as amended from time to time or limits set by the Regional Director, for the protection of the surface water at and off the Site.

   c. Ontario Drinking Water Quality Standards

Surface Water and Groundwater

3. The Owner shall monitor surface water and ground water in accordance with the monitoring programs outlined in the attached Schedule 2 and the documents in Schedule

1.

4. A certified Professional Geoscientist or Engineer possessing appropriate hydrogeologic training and experience shall execute or directly supervise the execution of the groundwater monitoring and reporting program.

Groundwater Wells and Monitors

5. The Owner shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.

6. Where landfilling is to proceed around monitoring wells, suitable extensions shall be added to the wells and the wells shall be properly re-secured.

7. Any groundwater monitoring well included in the on-going monitoring program that is damaged shall be assessed, repaired, replaced or decommissioned by the Owner, as required.

    a. The Owner shall repair or replace any monitoring well which is destroyed or in any way made to be inoperable for sampling such that no more than one regular sampling event is missed.

    b. All monitoring wells which are no longer required as part of the groundwater monitoring program, and have been approved by the Director for abandonment, shall be decommissioned by the Owner, as required, in accordance with Reg. 903, to prevent contamination through the abandoned well. A report on the decommissioning of the well shall be included in the Annual Report for the period during which the well was decommissioned.

Trigger Mechanisms and Contingency Plans

8. a. Trigger mechanisms shall be in accordance with the attachment 3 of item 18, Schedule 1.

    b. Contingency plan in the event of a confirmed exceedance of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate shall be in accordance with the attachment 3 of item 18, Schedule 1.

9. In the event of a confirmed exceedance of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate, the Owner shall immediately notify the District Manager, and an investigation into the cause and the need for implementation of remedial or contingency actions shall be carried out by the Owner in accordance with the approved trigger mechanisms and associated contingency plans.

10. If monitoring results, investigative activities and/or trigger mechanisms indicate the need

to implement contingency measures, the Owner shall ensure that the following steps are taken:

a. The Owner shall notify the District Manager, in writing of the need to implement contingency measures, no later than 30 days after confirmation of the exceedances;
b. Detailed plans, specifications and descriptions for the design, operation and maintenance of the contingency measures shall be prepared and submitted by the Owner to the Director for approval; and
c. The contingency measures shall be implemented by the Owner upon approval by the Director.

11. The Owner shall ensure that any proposed changes to the site-specific trigger levels for leachate impacts to the surface water or groundwater, are approved in advance by the Director via an amendment to this Approval.

Changes to the Monitoring Programs, Trigger Mechanisms and Contingency Plans

12. The Owner may request to make changes to the monitoring program(s), trigger mechanisms and/or contingency plan to the District Manager in accordance with the recommendations of the Annual Report. The Owner shall make clear reference to the proposed changes in a separate letter that shall accompany the Annual Report.

13. Within fourteen (14) days of receiving the written correspondence from the District Manager confirming that the District Manager is in agreement with the proposed changes to the environmental monitoring program, trigger mechanisms and/or contingency plans, the Owner shall forward a letter identifying the proposed changes and a copy of the correspondences from the District Manager and all other correspondences and responses related to the changes, to the Director requesting the Approval be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.

Action Plan

14. The Owner shall adhere to the action plan proposed in the e-mail dated December 10, 2018 (9:04 AM) from Iris O'Connor, Blumetric, to Ranjani Munasinghe, Ministry of the Environment, Conservation and Parks.

9. CLOSURE PLAN

1. At least two (2) years prior to closure, the Owner shall submit to the Director for approval, with copies to the District Manager, a detailed Site closure plan pertaining to the termination of landfilling operations at this Site, post-closure inspection, maintenance and monitoring, and end use. The plan shall include the following as a minimum but are

not limited to:

a. a plan showing Site appearance after closure;
b. a description of the proposed end use of the Site, that shall include a discussion on the Environmental Assessment commitments (if applicable) to dedicate portion of the lands within the Site that are not required for site post-closure operations and monitoring, to be used for community recreational purpose;
c. a description of how pollinator friendly plants were considered in the final vegetative cover for the landfill and/or in the landscaping within the Site;
d. a description of the procedures for closure of the Site:
    i. advance notification of the public of the landfill closure;
    ii. posting a sign at the Site entrance indicating the landfill is closed and identifying any alternative waste disposal arrangements;
    iii. completion, inspection and maintenance of the final cover and landscaping;
    iv. site security;
    v. removal of unnecessary landfill-related structures, buildings and facilities; and
    vi. final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
e. a schedule indicating the time-period for implementing sub-conditions i to vi above.
f. descriptions of the procedures for post-closure care of the Site, including:
    i. operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
    ii. record keeping and reporting; and
    iii. complaint contact and response procedures;
g. an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and
h. an updated estimate of the Contaminating Life Span of the Site, based on the results of the monitoring programs to date.

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

10. WASTE DIVERSION

1. The Owner shall ensure that:
    a. all bins and waste storage areas are clearly labelled;
    b. all lids or doors on bins shall be kept closed during non-operating hours and during high wind events; and
    c. if necessary to prevent litter, waste storage areas shall be covered during high winds events.

2. The Owner/Operator shall remove the refrigerant as defined in O. Reg. 463/10 in accordance with the following:
    a. all White Goods containing refrigerants which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, shall be stored in a separate area in an upright position; and

    b. White Goods containing refrigerants received at the Site shall be shipped off-Site in order to have the refrigerants removed by a licensed technician in accordance with O. Reg. 463/10; or

    c. the refrigerant shall be removed at the Site by a licensed technician, in accordance with O. Reg. 463/10, prior to shipping White Goods off-Site; and

    d. a detailed log of all White Goods containing refrigerants received shall be maintained. The log shall include the following:

        i. date of the record;
        ii. types, quantities and source of White Goods containing refrigerants received;
        iii. details on removal of refrigerants as required by O. Reg. 463/10; and
        iv. the quantities and destination of the White Goods and/or refrigerants transferred from the Site.

3. Household Batteries shall be kept at the attendant's shed in leak-proof, non-metallic or lined metal containers, in a manner which prevents contact with stormwater.

4. The Owner shall transfer waste and recyclable materials from the Site as follows:

    a. recyclable materials shall be transferred off-site once their storage bins are full;

    b. scrap metal shall be transferred off-site at least twice a year;

    c. tires shall be transferred off-site as soon as a load for the contractor hired by the Owner has accumulated or as soon as the accumulated volume exceeds the storage capacity of its bunker; and

    d. immediately, in the event that waste is creating an odour or vector problem.

5. The Owner shall notify the appropriate contractors that waste and recyclable wastes that are to be transferred off-site are ready for removal. Appropriate notice time, as determined by the contract shall be accommodated in the notification procedure.

6. The Owner may collect WEEE for transfer.

Schedule 1
Supporting Documentation

1. Application for Provisional Certificate of Approval for a Waste Disposal Site dated September 27, 1989 and the supporting information submitted therewith.

2. Letter from J,W, Tooley, MOE, to E,N. Tully, Township of Monteagle, dated November 21, 1989.

3. Letter from E.N. Tully, Township of Monteagle, to J.W. Tooley, MOE, dated December 8, 1989.

4. Agreement dated August 4, 1992, between The Centre & South Hastings Waste Management Board and The Corporation of the Township of Monteagle of the Province of Ontario, Re·: Recycling facility.

5. Letter dated February 18, 1993, from Eleanor N. Tully, Monteagle Township, to Jim Mulder, Ministry of Environment and Energy, Re: Application for· a Transfer Site to .allow recycling site at landfill and site plan entitled "Land Use Permit Area, situate in part of the N.W. Portion of Lot 30, Con. VIII Monteagle Twp. Hastings County".

6. Letter dated March 3, 1993, from Eleanor N. Tully, Monteagle Township, to Brian Nickel, Ministry of Environment and Energy, Re:Reply to Brian Nickel's faxed letter of March 3, 1993.

7. Ministry of Natural Resources Land Use Permit No. LUP 5201075 dated March 26, 1,993.

8. Letter dated July 20, 1993, from Eleanor N. Tully, Monteagle Township, to D.E.Graham, Ministry of Environment and Energy, Re: Submission of application requirements as requested by D.E. Graham's letter of May 7, 1993.

9. Application form for a Certificate of Approval for a Waste Disposal Site (Transfer) dated July 20, 1993.

10. Letter dated July 26, 1994, from Eleanor N . Tully, Monteagle Township, to Ed Tarvicz, Ministry of Environment and .Energy, Re: Withdrawal of application.

11. Letter dated November 6, 1996, from Eleanor N . Tully, Monteagle Township, to D.E.Graham, Ministry of Environment and Energy, Re:Re-submission of application package previously returned by the Ministry.

12. Letter and application form dated December 13, 1996, from Eleanor N. Tully, Monteagle Township, to Jim Mulder, Ministry .of Environment and Energy, Re: Submission of application form to amend certificate of Approval.

13. Application for amendment to Environmental Compliance Approval dated March 22, 2016 prepared by Blumetric Environmental

14. Email dated September 15, 2016 from Iris O'Connor, Senior Engineer, Blumetric Environmental to Hirva Vyas, P.Eng, Senior Review Engineer MOECC.

15. Environmental Compliance Approval Application dated February 9, 2018 and signed Pat Pilgrim, CAO, the Corporation of the Municipality of Hastings Highlands, including the attached supporting documentation.

16. Report titled "Development and Operations Plan, Hickey Road Waste Disposal Site, Environmental Compliance Approval No. A362301" dated January 2018 and prepared by BluMetric Environmental Inc.

17. Electronic mail dated December 10, 2018 (9:04 AM) from Iris O'Connor, Blumetric, to Ranjani Munasinghe, Ministry of the Environment, Conservation and Parks responding to comments from Technical Support Section, Ministry of the Environment, Conservation and Parks.

18. Environmental Compliance Approval Application dated September 10, 2024 and signed David Stewart, CAO/Deputy Treasurer, The Corporation of the Municipality of Hastings Highlands, including the attached supporting documentation prepared by BluMetric Environmental Inc.

Schedule 2

Surface water and Groundwater Monitoring Program

Table 1: Spring and Fall Surface Water Analysis

Category	Parameters
Organic Parameters	Biological Oxygen Demand (BOD_5), Total Phosphorus, Total Kjeldahl Nitrogen (TKN)
Inorganic Parameters	Ammonia, Chloride, Nitrate, Nitrite, Major Ions (Sodium, Calcium, Magnesium, Sulphate, Alkalinity, Potassium)
Metals	Aluminum (dissolved), Barium, Boron, Cobalt, Copper, Iron, Lead, Manganese, Zinc
Physical/Chemical Parameters	Chemical Oxygen Demand (COD), Conductivity, pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Hardness

Table 2: Spring and Fall Groundwater Analysis

Category	Parameters
Organic Parameters	Dissolved Organic Carbon (DOC)
Inorganic Parameters	Ammonia, Chloride, Nitrate, Major Ions (Sodium, Potassium, Calcium, Magnesium, Sulphate, Alkalinity)
Metals	Aluminum, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Silicon, Silver, Strontium, Thallium, Titanium, Vanadium, Zinc
Physical/Chemical Parameters	Chemical Oxygen Demand (COD), Conductivity, pH, Total Dissolved Solids (TDS)

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

GENERAL

- The reason for conditions 1.1, 1.2, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.18, 1.19 and 1.20 is to clarify the legal rights and responsibilities of the Owner and Operator under this Approval.

- The reasons for condition 1.3 are to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.

- The reasons for condition 1.11 are to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.

- The reasons for condition 1.12 are to restrict potential transfer or encumbrance of the Site without the approval of the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Approval.

- The reason for condition 1.13 is to ensure that the successor is aware of its legal responsibilities.

- The reasons for conditions 1.14, 1.15 and 1.16 are that the Part II.1 Director is an individual with authority pursuant to Section 197 of the Environmental Protection Act to require registration on title and provide any person with an interest in property before dealing with the property in any way to give a copy of the Approval to any person who will acquire an interest in the property as a result of the dealing.

- The reason for condition 1.17 is to ensure that appropriate Ministry staff has ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this Approval. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the Act, the OWRA, the PA, the NMA and the SDWA.

- Condition 1.21 has been included in order to clarify what information may be subject to the Freedom of Information Act.

SITE OPERATION

- The reasons for conditions 2.1, 2.5 and 6.3 are to ensure that the Site is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.

- The reason for conditions 2.2, 2.3 and 2.4 is to ensure that users of the Site are fully aware of important information and restrictions related to Site operations and access under this Approval.

- The reasons for condition 2.6.a and 2.6.b are open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance effects, and the potential fire hazard and to make sure burning of brush and wood are carried out in accordance with Ministry guidelines.

- The reasons for condition 2.7, 2.8, 2.9 and 2.10 are to specify the hours of operation for the landfill site and a mechanism for amendment of the hours of operation, as required.

- The reasons for condition 2.11 and 2.12 are to ensure that the Site is supervised by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person and to ensure the controlled access and integrity of the Site by preventing unauthorized access when the Site is closed and no site attendant is on duty.

EMPLOYEE TRAINING

- The reason for condition 3.1 is to ensure that the Site is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.

COMPLAINTS RESPONSE PROCEDURE

- The reason for condition 4.1 is to ensure that any complaints regarding landfill operations at this Site are responded to in a timely and efficient manner.

EMERGENCY RESPONSE

- Conditions 5.1 and 5.2 are included to ensure that emergency situations are reported to the Ministry to ensure public health and safety and environmental protection.

- Conditions 5.3, 5.4 and 5.5 are included to ensure that emergency situations are handled in a manner to minimize the likelihood of an adverse effect and to ensure public health and safety and environmental protection.

INSPECTIONS, RECORD KEEPING AND REPORTING

- The reason for conditions 6.1 and 6.2 is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this Approval (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the EPA and its regulations.

- The reason for conditions 6.4 and 6.5 is to ensure that detailed records of Site inspections are recorded and maintained for inspection and information purposes.

- The reasons for conditions 6.6 and 6.7 are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design,

operations or monitoring programs are identified. An Annual Report is an important tool used in reviewing site activities and for determining the effectiveness of site design.

LANDFILL DESIGN AND DEVELOPMENT

- The reason for conditions 7.1 to 7.6 inclusive is to specify the approved areas from which waste may be accepted at the Site and the types and amounts of waste that may be accepted for disposal at the Site, based on the Owner's application and supporting documentation.

- Condition 7.7 is to provide the Owner the process for getting the approval for alternative daily and intermediate cover material.

- The reasons for condition 7.8 are to ensure that daily/weekly and intermediate cover are used to control potential nuisance effects, to facilitate vehicle access on the Site, and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the Site.

- The reasons for Condition 7.9, 7.10 and 7.11 are to ensure that waste from Universal Seal Incorporated is properly managed in order to prevent environmental detriment and to ensure the safety of the general public and site personal.

LANDFILL MONITORING

- Reasons for condition 8.1 are to ensure that landfill gas is monitored and all buildings at the Site are free of any landfill gas accumulation, which due to a methane gas component may be explosive and thus create a danger to any persons at the Site.

- Condition 8.2 is included to provide the groundwater and surface water limits to prevent water pollution at the Site.

- Conditions 8.3 and 8.4 are included to require the Owner to demonstrate that the Site is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.

- Conditions 8.5, 8.6 and 8.7 are included to ensure the integrity of the groundwater monitoring network so that accurate monitoring results are achieved, and the natural environment is protected.

- Conditions 8.8 to 8.11 inclusive are added to ensure the Owner has a plan with an organized set of procedures for identifying and responding to potential issues relating to groundwater and surface water contamination at the Site's compliance point.

- Conditions 8.12 and 8.13 are included to streamline the approval of the changes to the

monitoring plans and trigger mechanisms and contingency plans.

- Condition 8.14 was included to ensure the Owner complete the tasks and work towards bringing the Site into compliance as proposed by the Owner.

CLOSURE PLAN

- The reasons for condition 9 are to ensure that final closure of the Site is completed in an aesthetically pleasing manner, in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.

WASTE DIVERSION

- Condition 10 is included to ensure that the recyclable materials are stored in their temporary storage location and transferred off-site in a manner as to minimize a likelihood of an adverse effect or a hazard to the natural environment or any person.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A362301 issued on December 20, 2018

In accordance with Section 139 of the *Environmental Protection Act,* you may by written notice served upon me and the Ontario Land 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 ("the Notice") shall state:

a. 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;
b. 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:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. 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:

Registrar*
Ontario Land Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario

and

The Director appointed for the purposes of Part II.1 of the *Environmental Protection Act*
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor

M5G 1E5
OLT.Registrar@ontario.ca

Toronto, Ontario
M4V 1P5

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.oltt.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 19th day of July, 2025

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

RM/
c: Area Manager, MECP Belleville
c: District Manager, MECP Kingston - District
Carolyn Miller P. Eng. and S'rana Scholes P. Eng., BluMetric Environmental Inc.

Appendix A

A-2 Environmental Compliance Approval – December 2018

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A362301
Issue Date: December 20, 2018

The Corporation of the Municipality of Hastings Highlands
33011 Highway 62 N
Post Office Box, No. 130
Maynooth, Ontario
K0L 2S0

Site Location: Hickey Road WDS
Lot Part of 30, Concession 8
Hastings Highlands Municipality, County of Hastings

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the use and operation of 3.0 hectare waste disposal/transfer site within a total site area of 4.0 hectares.

For the purpose of this environmental compliance approval, the following definitions apply:

- *"Approval"* means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A";
- *"Contaminating Life Span"* means contaminating life span as defined in Ontario Regulation 232/98;
- *"Director"* means any *Ministry* employee appointed in writing by the Minister pursuant to section 5 of the EPA as a Director for the purposes of Part II.1 of the *EPA;*
- *"District Manager"* means the District Manager of the local district office of the *Ministry* in which the *Site* is geographically located;
- *"EPA"* means *Environmental Protection Act* , R.S.O. 1990, c. E. 19, as amended;
- *"Ministry"* means the Ontario Ministry of the Environment, Conservation and Parks;

- *"NMA"* means *Nutrient Management Act* , 2002, S.O. 2002, c. 4, as amended;

- *"Ontario Drinking Water Quality Standards"* means Ontario Regulation 169/03 (Ontario Drinking Water Quality Standards) as amended;

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

- *"Owner"* means any person that is responsible for the establishment or operation of the *Site* being approved by this *Approval,* and includes the Corporation of the Municipality of Hastings Highlands and its successors and assigns;

- *"OWRA"* means the *Ontario Water Resources Act* , R.S.O. 1990, c. O.40, as amended;

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

- *"Provincial Officer"* means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the *OWRA,* Section 5 of the *EPA,* Section 17 of the *PA,* Section 4 of the *NMA,* or Section 8 of the *SDWA;*

- *"Refrigerant Appliances"* means household appliances which use, or may use refrigerants, and which include, but is not restricted to, refrigerators, freezers and air-conditioning systems;

- *"Regional Director"* means the Regional Director of the local Regional Office of the *Ministry* in which the *Site* is located;

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

- *"Regulation 347"* means Regulation 347, R.R.O. 1990, made under the EPA, as amended;

- *"Regulation 903"* means Regulation 903, R.R.O. 1990, made under the *OWRA,* as amended;

- *"SDWA"* means *Safe Drinking Water Act,* 2002, S.O. 2002, c. 32, as amended;

- *"Site"* means the entire waste disposal site, including the buffer lands, and contaminant attenuation zone at 202 Hickey Road, Municipality of Hastings Highlands, County of Hastings; and

- *"Trained Personnel"* means personnel knowledgeable in the following through instruction and/or practice:
  - relevant waste management legislation, regulations and guidelines;
  - major environmental concerns pertaining to the waste to be handled;
  - occupational health and safety concerns pertaining to the processes and wastes to be handled;

- management procedures including the use and operation of equipment for the processes and wastes to be handled;
- emergency response procedures;
- specific written procedures for the control of nuisance conditions;
- specific written procedures for refusal of unacceptable waste loads; and
- the requirements of this *Approval.*

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

TERMS AND CONDITIONS

1. GENERAL

Compliance

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

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

In Accordance

(3) Except as otherwise provided by this *Approval,* the *Site* shall be designed, developed, built, operated and maintained in accordance with the documentation listed in the attached Schedule "A".

Interpretation

(4) Where there is a conflict between a provision of any document listed in Schedule "A" in this *Approval,* and the conditions of this *Approval,* the conditions in this *Approval* shall take precedence.

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

(6) Where there is a conflict between any two documents listed in Schedule "A", the document bearing the most recent date shall take precedence.

(7) The conditions of this *Approval* are severable. If any condition of this *Approval,* or the

application of any condition of this *Approval* to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this *Approval* shall not be affected thereby.

Other Legal Obligations

(8) The issuance of, and compliance with, this *Approval* does not:

a. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
b. limit in any way the authority of the *Ministry* to require certain steps be taken or to require the *Owner* and *Operator* to furnish any further information related to compliance with this *Approval.*

Adverse Effect

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

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

Change of Ownership

(11) The *Owner* shall notify the *Director,* in writing, and forward a copy of the notification to the *District Manager,* within 30 days of the occurrence of any changes in the following information:

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

(12) No portion of this *Site* shall be transferred or encumbered prior to or after closing of the *Site* unless the *Director* is notified in advance and sufficient financial assurance is deposited with the *Ministry* to ensure that these conditions will be carried out.

(13) In the event of any change in ownership of the *Site,* other than change to a successor municipality, the *Owner* shall notify the successor of and provide the successor with a

copy of this *Approval,* and the *Owner* shall provide a copy of the notification to the *District Manager* and the *Director.*

Registration on Title Requirement

(14) Prior to dealing with the property in any way, the *Owner* shall provide a copy of this *Approval* and any amendments, to any person who will acquire an interest in the property as a result of the dealing.

(15) a. By March 31, 2019, the *Owner* shall submit to the *Director* a completed Certificate of Requirement which shall include:

i. a plan of survey prepared, signed and sealed by an Ontario Land Surveyor, which shows the area of the *Site* where waste has been or is to be deposited at the *Site;*

ii. proof of ownership of the *Site;*

iii. a letter signed by a member of the Law Society of Upper Canada or other qualified legal practitioner acceptable to the *Director,* verifying the legal description provided in the Certificate of Requirement;

iv. the legal abstract of the property; and

v. any supporting documents including a registerable description of the *Site.*

b. By March 31, 2019, the *Owner* shall:

i. register the Certificate of Requirement in the appropriate Land Registry Office on the title to the property; and

ii. submit to the *Director* and the *District Manager,* written verification that the Certificate of Requirement has been registered on title.

Registration on Title Requirement - Contaminant Attenuation Zone (CAZ)

(16) By March 31, 2019, the *Owner* shall, submit to the *Director* documents confirming that a contaminant attenuation zone (CAZ) has been established, in either fee simple or by way of a groundwater easement.

(17) By March 31, 2019, the *Owner* shall submit to the *Director* a completed Certificate of Requirement which shall include:

a. If rights are obtained in fee simple, the *Owner* shall provide:

i. documentation evidencing ownership of the CAZ obtained in compliance with

O.Reg. 232/98, as amended;

ii. a completed Certificate of Requirement and supporting documents containing a registerable description of the CAZ; and

iii. a letter signed by a member of the Law Society of Upper Canada; or other qualified legal practitioner acceptable to the *Director,* verifying the legal description of the CAZ.

b. By February 28, 2019, the *Owner* shall:

i. register the Certificate of Requirement in the appropriate Land Registry Office on the title to the property; and

ii. submit to the *Director* and the *District Manager,* written verification that the Certificate of Requirement has been registered on title.

c. If rights are obtained by way of a groundwater easement, the Applicant shall:

i. provide a copy of the easement;

ii. provide a plan of survey signed and sealed by an Ontario Land Surveyor for the CAZ;

iii. submit proof of registration on title of the groundwater easement to the *Director;*

d. The *Owner* shall not amend or remove or consent to the removal of the easement or CAZ from title without the prior written consent of the *Director.*

Inspections by the *Ministry*

(18) No person shall hinder or obstruct a *Provincial Officer* from carrying out any and all inspections authorized by the *OWRA,* the *EPA,* the *PA,* the *SDWA* or the *NMA,* of any place to which this *Approval* relates, and without limiting the foregoing:

a. to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this *Approval* are kept;

b. to have access to, inspect, and copy any records required to be kept by the conditions of this *Approval;*

c. to inspect the *Site,* related equipment and appurtenances;

d. to inspect the practices, procedures, or operations required by the conditions of this

Approval; and

e. to sample and monitor for the purposes of assessing compliance with the terms and conditions of this *Approval* or the *EPA*, the *OWRA*, the *PA*, the *SDWA* or the *NMA*.

Information and Record Retention

(19) a. Except as authorized in writing by the *Director*, all records required by this *Approval* shall be retained at the Municipality of Hastings Highlands Office for a minimum of two (2) years from their date of creation.

b. The *Owner* shall retain all documentation listed in Schedule "A" for as long as this *Approval* is valid.

c. All monthly summary reports of waste records collected are to be kept at the Municipality of Hastings Highlands Office until they are included in the Annual Report.

d. The *Owner* shall retain employee training records as long as the employee is working at the Municipality of Hastings Highlands Office.

e. The *Owner* shall make all of the above documents available for inspection upon request of *Ministry* staff.

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

a. an approval, waiver, or justification by the *Ministry* of any act or omission of any person that contravenes any term or condition of this *Approval* or any statute, regulation or other legal requirement; or

b. acceptance by the *Ministry* of the information's completeness or accuracy.

(21) The *Owner* shall ensure that a copy of this *Approval*, in its entirety and including all its Notices of Amendment, and documentation listed in Schedule "A", are retained at the *Site* at all times.

(22) Any information related to this *Approval* and contained in *Ministry* files may be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, RSO 1990, CF-31.

2. SITE OPERATION

Operation

(1) The *Site* shall be operated and maintained at all times including management and disposal of all waste, in accordance with the *EPA, Regulation 347,* and the conditions of this *Approval.* At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

Signs

(2) A sign shall be installed and maintained at the main entrance/exit to the *Site* which legibly display the following information:

a. the name of the *Site* and *Owner;*

b. the number of the *Approval;*

c. the name of the *Operator;*

d. the normal hours of operation;

e. the allowable and prohibited waste types;

f. the telephone number to which complaints may be directed;

g. a warning against unauthorized access;

h. a twenty-four (24) hour emergency telephone number (if different from above); and

i. a warning against dumping outside the *Site.*

(3) The *Owner* shall install and maintain signs to direct vehicles to working face and recycling areas.

(4) The *Owner* shall provide signs at recycling area informing users what materials are acceptable and directing users to appropriate storage areas.

Vermin, Vectors, Dust, Litter, Odour, Noise and Traffic

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

Burning Waste Prohibited

(6) a. Burning of waste at the *Site* is prohibited.

b. Notwithstanding Condition 2. (6) (a) above, burning of segregated, clean wood and brush at the landfill may be carried out in strict compliance with the Ministry of the Environment Document titled "Guideline C-7, Burning at Landfill Sites" dated April 1994.

Site Access

(7) Waste shall only be accepted during the following time periods:

Summer (Victoria Day to Thanksgiving)

Tuesday and Friday :12:00 p.m. - 5:00 p.m.

Winter (Thanksgiving to Victoria Day)

Friday :12:00 p.m. - 5:00 p.m.

(8) On-site equipment used for site preparation and closing activities may be operated between 7 a.m. and 5 p.m. Monday to Friday.

(9) With the prior written approval from the *District Manager,* the time periods may be extended to accommodate seasonal or unusual quantities of waste.

(10) Waste/recyclables may be relocated on-site or removed off-site by registered/licensed waste haulers during the hours of 7 a.m. and 5 p.m. Monday to Friday. These activities shall only be carried out by trained personnel of registered/licensed waste haulers.

Site Security

(11) No waste shall be received, landfilled or removed from the *Site* unless a site supervisor or an attendant is present and supervises the operations during operating hours. The *Site* shall be closed when a site attendant is not present to supervise landfilling operations.

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

3. EMPLOYEE TRAINING

(1) A training plan for all employees that operate any aspect of the *Site* shall be developed

and implemented by the *Owner* or the *Operator*. Only *Trained Personnel* shall operate any aspect of the *Site* or carry out any activity required under this *Approval* .

4. COMPLAINTS RESPONSE PROCEDURE

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

a. The *Owner* shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint, the name, address and the telephone number of the complainant if the complainant will provide this information and the time and date of the complaint;

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

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

5. EMERGENCY RESPONSE

(1) All Spills as defined in the *EPA* shall be immediately reported to the **Ministry's Spills Action Centre at 1-800-268-6060** and shall be recorded in the log book as to the nature of the emergency situation, and the action taken for clean-up, correction and prevention of future occurrences.

(2) In addition, the *Owner* shall submit, to the *District Manager* a written report within three (3) business days of the emergency situation, outlining the nature of the incident, remedial measures taken, handling of waste generated as a result of the emergency situation and the measures taken to prevent future occurrences at the *Site*.

(3) All wastes resulting from an emergency situation shall be managed and disposed of in accordance with *Reg. 347*.

(4) All equipment and materials required to handle the emergency situations shall be:

a. kept on hand at all times that waste landfilling and/or handling is undertaken at the *Site;* and

b. adequately maintained and kept in good repair.

(5) The *Owner* shall ensure that the emergency response personnel are familiar with the use of such equipment and its location(s).

6. INSPECTIONS, RECORD KEEPING AND REPORTING

Daily Log Book

(1) A daily log shall be maintained in written or electronic format and shall include the following information:

a. the type, date and time of arrival, hauler, and quantity (tonnes) of all waste and cover material received at the *Site;*

b. the area of the *Site* in which waste disposal operations are taking place;

c. a record of litter collection activities and the application of any dust suppressants;

d. a record of the daily inspections; and

e. a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service.

(2) Any information requested, by the *Director* or a *Provincial Officer,* concerning the *Site* and its operation under this *Approval,* including but not limited to any records required to be kept by this *Approval* shall be provided to the *Ministry,* upon request.

Daily Inspections and Log Book

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

(4) A record of the inspections shall be kept in a daily log book that includes:

a. the name and signature of person that conducted the inspection;

b. the date and time of the inspection;

c. the list of any deficiencies discovered;

d. the recommendations for remedial action; and

e. the date, time and description of actions taken.

(5) A record shall be kept in the daily log book of all refusals of waste shipments, the reason(s) for refusal, and the origin of the waste, if known.

Annual Report

(6) A written report on the development, operation and monitoring of the *Site,* shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the *District Manager,* by March 31st of the year following the period being reported upon.

(7) The Annual Report shall include but not be limited to the following information:

a. the results and an interpretive analysis of the results of all leachate, groundwater surface water and landfill gas monitoring, including an assessment of the need to amend the monitoring programs;

b. an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the *Site,* and the adequacy of and need to implement the contingency plans;

c. site plans showing the existing contours of the *Site;* areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; facilities existing, added or removed during the reporting period; and site preparations and facilities planned for installation during the next reporting period;

d. calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the *Site* during the reporting period and a calculation of the total volume of *Site* capacity used during the reporting period;

e. a calculation of the remaining capacity of the *Site* and an estimate of the remaining *Site* life;

f. a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the *Site;*

g. a summary of any complaints received and the responses made;

h. a discussion of any operational problems encountered at the *Site* and corrective action

taken;

i. any changes to the Design and Operations Report and the Closure Plan that have been approved by the *Director* since the last *Annual Report;*

j. a report on the status of all monitoring wells and a statement as to compliance with *Ontario Regulation 903;* and

k. any other information with respect to the *Site* which the *District Manager* may require from time to time.

7. LANDFILL DESIGN AND DEVELOPMENT

Approved Waste Types

(1) Only municipal waste as defined under *Reg.* 347 being solid non-hazardous shall be accepted at the *Site* for landfilling.

(2) The *Owner* shall develop and implement a program to inspect waste to ensure that the waste received at the *Site* is of a type approved for acceptance under this *Approval.*

(3) The *Owner* shall ensure that all loads of waste are properly inspected by *Trained personnel* prior to acceptance at the *Site* and that the waste vehicles are directed to the appropriate areas for disposal or transfer of the waste. The *Owner* shall notify the *District Manager,* in writing, of load rejections at the *Site* within one (1) business day from their occurrence.

Capacity

(4) Maximum volumetric capacity approved for the *Site,* consisting of the waste, daily cover and intermediate cover, but excluding the final cover is 74,100 cubic meters. This volume includes the historical waste volume of 32,300 cubic meters as of 2016.

(5) This approval is for the design, operation and use of 41,800 cubic meters of the calculated theoretical maximum volumetric capacity of the *Site* as described in documents in Schedule "A".

Service Area

(6) Only waste that is generated within the boundaries of the Municipality of Hastings Highlands may be accepted at the *Site.*

Cover

(7) Alternative materials to soil may be used as weekly and interim cover material, based on an application with supporting information and applicable fee for a trial use or permanent use, submitted by the *Owner* to the *Director,* copied to the *District Manager* and as approved by the *Director* via an amendment to this *Approval.* The alternative material shall be non-hazardous according to *Reg. 347* and will be expected to perform at least as well as soil in relation to the following functions:

a. Control of blowing litter, odours, dust, landfill gas, gulls, vectors, vermin and fires;

b. Provision for an aesthetic condition of the landfill during the active life of the *Site;*

c. Provision for vehicle access to the active tipping face; and

d. Compatibility with the design of the *Site* for groundwater protection, leachate management and landfill gas management.

(8) Cover material shall be applied as follows:

a. Weekly Cover - Weather permitting, deposited waste shall be covered **weekly** in a manner acceptable to the *District Manager* so that no waste is exposed to the atmosphere;

b. Intermediate Cover - In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 millimetre of soil cover or an approved thickness of alternative cover material shall be placed; and

c. Final Cover - In areas where landfilling has been completed to final contours, a minimum 600 millimetre thick layer of soil of medium permeability and 150 millimetres of top soil (vegetative cover) shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

(9) Approved wastes from Universal Seal Incorporated shall be placed in an excavation in an area remote from burning areas and covered with clean earth fill immediately

(10) When frozen ground conditions do not permit excavation, all approved wastes from Universal Seal Incorporated may be disposed on in trenches prepared ahead of time and cover immediately.

(11) No waste from Universal Seal Incorporated shall be burned.

8. LANDFILL MONITORING

Landfill Gas

(1) The *Owner* shall ensure that any buildings or structures at the *Site* contain adequate ventilation systems to relieve any possible landfill gas accumulation to prevent methane concentration reaching the levels within its explosive range. Routine monitoring for explosive methane gas levels shall be conducted in all buildings or structures at the *Site,* especially enclosed structures which at times are occupied by people.

Compliance

(2) The *Site* shall be operated in such a way as to ensure compliance with the following:

a. Reasonable Use Guideline B-7 for the protection of the groundwater at the *Site;* and

b. Provincial Water Quality Objectives included in the July 1994 publication entitled *Water Management Policies, Guidelines, Provincial Water Quality Objectives,* as amended from time to time or limits set by the *Regional Director,* for the protection of the surface water at and off the *Site.*

Surface Water and Groundwater

(3) The *Owner* shall monitor surface water and ground water in accordance with the monitoring programs outlined in the attached Schedule "B" and the documents in Schedule "A".

(4) A certified Professional Geoscientist or Engineer possessing appropriate hydrogeologic training and experience shall execute or directly supervise the execution of the groundwater monitoring and reporting program.

Groundwater Wells and Monitors

(5) The *Owner* shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.

(6) Where landfilling is to proceed around monitoring wells, suitable extensions shall be added to the wells and the wells shall be properly re-secured.

(7) Any groundwater monitoring well included in the on-going monitoring program that is damaged shall be assessed, repaired, replaced or decommissioned by the *Owner,* as required.

a. The *Owner* shall repair or replace any monitoring well which is destroyed or in any way

made to be inoperable for sampling such that no more than one regular sampling event is missed.

b. All monitoring wells which are no longer required as part of the groundwater monitoring program, and have been approved by the *Director* for abandonment, shall be decommissioned by the *Owner*, as required, in accordance with *O.Reg. 903*, to prevent contamination through the abandoned well. A report on the decommissioning of the well shall be included in the Annual Report for the period during which the well was decommissioned.

Trigger Mechanisms and Contingency Plans

(8) a. Within one (1) year from the date of this *Approval*, the *Owner* shall submit to the *Director*, for approval, and copies to the *District Manager*, details of a trigger mechanisms plan for surface water and groundwater quality monitoring for the purpose of initiating investigative activities into the cause of increased contaminant concentrations.

b. Within one (1) year from the date of this *Approval*, the *Owner* shall submit to the *Director* for approval, and copies to the *District Manager*, details of a contingency plan to be implemented in the event that the surface water or groundwater quality exceeds any trigger mechanism.

(9) In the event of a confirmed exceedance of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate, the *Owner* shall immediately notify the *District Manager*, and an investigation into the cause and the need for implementation of remedial or contingency actions shall be carried out by the *Owner* in accordance with the approved trigger mechanisms and associated contingency plans.

(10) If monitoring results, investigative activities and/or trigger mechanisms indicate the need to implement contingency measures, the *Owner* shall ensure that the following steps are taken:

a. The *Owner* shall notify the *District Manager*, in writing of the need to implement contingency measures, no later than 30 days after confirmation of the exceedances;

b. Detailed plans, specifications and descriptions for the design, operation and maintenance of the contingency measures shall be prepared and submitted by the *Owner* to the *Director* for approval; and

c. The contingency measures shall be implemented by the *Owner* upon approval by the *Director.*

(11) *The Owner shall* ensure that any proposed changes to the site-specific trigger levels for

leachate impacts to the surface water or groundwater, are approved in advance by the *Director* via an amendment to this *Approval.*

Changes to the Monitoring Plan

(12) The *Owner* may request to make changes to the monitoring program(s) to the *District Manager* in accordance with the recommendations of the annual report. The *Owner* shall make clear reference to the proposed changes in a separate letter that shall accompany the annual report.

(13) Within fourteen (14) days of receiving the written correspondence from the *District Manager* confirming that the *District Manager* is in agreement with the proposed changes to the environmental monitoring program, the *Owner* shall forward a letter identifying the proposed changes and a copy of the correspondences from the *District Manager* and all other correspondences and responses related to the changes to the monitoring program, to the *Director* requesting the *Approval* be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.

(14) In the event any other changes to the environmental monitoring program are proposed outside of the recommendation of the annual report, the *Owner* shall follow current *Ministry* procedures for seeking approval for amending the *Approval.*

Action Plan

(15) The Owner shall adhere to the action plan proposed in the e-mail dated December 10, 2018 (9:04 AM) from Iris O'Connor, Blumetric, to Ranjani Munasinghe, Ministry of the Environment, Conservation and Parks.

9. CLOSURE PLAN

(1) At least three (3) years prior to the anticipated date of closure of this *Site,* the *Owner* shall submit to the *Director* for approval, with copies to the *District Manager,* a detailed *Site* closure plan pertaining to the termination of landfilling operations at this *Site,* post-closure inspection, maintenance and monitoring, and end use. The plan shall include but not be limited to the following information:

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

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

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

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

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

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

iv. *Site* security;

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

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

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

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

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

ii. record keeping and reporting; and

iii. complaint contact and response procedures;

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

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

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

10. WASTE DIVERSION

(1) The *Owner* shall ensure that:

a. all bins and waste storage areas are clearly labelled;

b. all lids or doors on bins shall be kept closed during non-operating hours and during high wind events; and

c. if necessary to prevent litter, waste storage areas shall be covered during high winds

events.

(2) The *Owner* shall provide a segregated area for the storage of *Refrigerant Appliances* so that the following are ensured:

a. all *Refrigerant Appliances* have been tagged to indicate that the refrigerant has been removed by a licensed technician. The tag number shall be recorded in the log book and shall remain affixed to the appliance until transferred from the *Site;* **or**

b. all *Refrigerant Appliances* accepted at the *Site,* which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, are stored segregated, in a clearly marked area, in an upright position and in a manner which allows for the safe handling and transfer from the *Site* for removal of refrigerants as required by O.Reg. 189; and

c. all *Refrigerant Appliances* received on-site shall either have the refrigerant removed prior to being transferred from the *Site* or shall be shipped off-site only to facilities where the refrigerants can be removed by a licensed technician in accordance with O.Reg. 189.

(3) Household batteries shall be kept at the attendant's shed in leak-proof, non-metallic or lined metal containers, in a manner which prevents contact with stormwater.

(4) The *Owner* shall transfer waste and recyclable materials from the *Site* as follows:

a. recyclable materials shall be transferred off-site once their storage bins are full;

b. scrap metal shall be transferred off-site at least twice a year;

c. tires shall be transferred off-site as soon as a load for the contractor hired by the *Owner* has accumulated or as soon as the accumulated volume exceeds the storage capacity of its bunker; and

d. immediately, in the event that waste is creating an odour or vector problem.

(5) The *Owner* shall notify the appropriate contractors that waste and recyclable wastes that are to be transferred off-site are ready for removal. Appropriate notice time, as determined by the contract shall be accommodated in the notification procedure.

(6) Collection, storage and transfer of Waste Electrical and Electronic Equipment shall be in accordance with the documents in the Schedule "A". If there is any discrepancy between the guideline titled "Collection Site Organizing & Operating Waste Electrical and Electronic Equipment (WEEE) Guidebook" dated November 2012 as amended prepared by Ontario Electronic Stewardship and the documents in Schedule "A", the guideline shall take precedence.

SCHEDULE "A"

1. Application for Provisional Certificate of Approval for a Waste Disposal Site dated September 27, 1989 and the supporting information submitted therewith.

2. Letter from J,W, Tooley, MOE, to E,N. Tully, Township of Monteagle, dated November 21, 1989.

3. Letter from E.N. Tully, Township of Monteagle, to J.W. Tooley, MOE, dated December 8, 1989.

4. Agreement dated August 4, 1992, between The Centre & South Hastings Waste Management Board and The Corporation of the Township of Monteagle of the Province of Ontario, Re·: Recycling facility.

5. Letter dated February 18, 1993, from Eleanor N. Tully, Monteagle Township, to Jim Mulder, Ministry of Environment and Energy, Re: Application for· a Transfer Site to .allow recycling site at landfill and site plan entitled "Land Use Permit Area, situate in part of the N.W. Portion of Lot 30, Con. VIII Monteagle Twp. Hastings County".

6. Letter dated March 3, 1993, from Eleanor N. Tully, Monteagle Township, to Brian Nickel, Ministry of Environment and Energy, Re:Reply to Brian Nickel's faxed letter of March 3, 1993.

7. Ministry of Natural Resources Land Use Permit No. LUP 5201075 dated March 26, 1,993.

8. Letter dated July 20, 1993, from Eleanor N. Tully, Monteagle Township, to D.E.Graham, Ministry of Environment and Energy, Re: Submission of application requirements as requested by D.E. Graham's letter of May 7, 1993.

9. Application form for a Certificate of Approval for a Waste Disposal Site (Transfer) dated July 20, 1993.

10. Letter dated July 26, 1994, from Eleanor N . Tully, Monteagle Township, to Ed Tarvicz, Ministry of Environment and .Energy, Re: Withdrawal of application.

11. Letter dated November 6, 1996, from Eleanor N . Tully, Monteagle Township, to D.E.Graham, Ministry of Environment and Energy, Re:Re-submission of application package previously returned by the Ministry.

12. Letter and application form dated December 13, 1996, from Eleanor N. Tully, Monteagle Township, to Jim Mulder, Ministry .of Environment and Energy, Re: Submission of application form to amend certificate of Approval.

13. Application for amendment to Environmental Compliance Approval dated March 22, 2016 prepared by Blumetric Environmental

14. Email dated September 15, 2016 from Iris O'Connor, Senior Engineer, Blumetric Environmental to

Hirva Vyas, P.Eng, Senior Review Engineer MOECC.

15. Environmental Compliance Approval Application dated February 9, 2018 and signed Pat Pilgrim, CAO, the Corporation of the Municipality of Hastings Highlands, including the attached supporting documentation.

16. Report titled "Development and Operations Plan, Hickey Road Waste Disposal Site, Environmental Compliance Approval No. A362301" dated January 2018 and prepared by BluMetric Environmental Inc.

17. Electronic mail dated December 10, 2018 (9:04 AM) from Iris O'Connor, Blumetric, to Ranjani Munasinghe, Ministry of the Environment, Conservation and Parks responding to comments from Technical Support Section, Ministry of the Environment, Conservation and Parks.

Schedule "B"

Surface water and Groundwater Monitoring Program

Table 1: Spring and Fall Surface Water Analysis

Category	Parameters
Organic Parameters	Biological Oxygen Demand (BOD_5), Total Phosphorus, Total Kjeldahl Nitrogen (TKN)
Inorganic Parameters	Ammonia, Chloride, Nitrate, Nitrite, Major Ions (Sodium, Calcium, Magnesium, Sulphate, Alkalinity, Potassium)
Metals	Aluminum (dissolved), Barium, Boron, Cobalt, Copper, Iron, Lead, Manganese, Zinc
Physical/Chemical Parameters	Chemical Oxygen Demand (COD), Conductivity, pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Hardness

Schedule "B" Continued next page...

Schedule "B"

Table 2: Spring and Fall Groundwater Analysis

Category	Parameters
Organic Parameters	Dissolved Organic Carbon (DOC)
Inorganic Parameters	Ammonia, Chloride, Nitrate, Major Ions (Sodium, Potassium, Calcium, Magnesium, Sulphate, Alkalinity)
Metals	Aluminum, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Silicon, Silver, Strontium, Thallium, Titanium, Vanadium, Zinc
Physical/Chemical Parameters	Chemical Oxygen Demand (COD), Conductivity, pH, Total Dissolved Solids (TDS)

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

- The reason for Conditions 1(1), (2), (4), (5), (6), (7), (8), (9), (10), (19), (20) and (21) is to clarify the legal rights and responsibilities of the *Owner* and *Operator* under this *Approval.*

- The reasons for Condition 1(3) are to ensure that the *Site* is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the *Owner,* and not in a manner which the *Director* has not been asked to consider.

- The reasons for Condition 1(11) are to ensure that the *Site* is operated under the corporate name which appears on the application form submitted for this *approval* and to ensure that the *Director* is informed of any changes.

- The reasons for Condition 1(12) are to restrict potential transfer or encumbrance of the *Site* without the approval of the *Director* and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this *Approval.*

- The reason for Condition 1(13) is to ensure that the successor is aware of its legal responsibilities.

- The reasons for Conditions 1(14), 1(15), 1(16) and 1(17) are that the Part II.1 *Director* is an individual with authority pursuant to Section 197 of the Environmental Protection Act to require registration on title and provide any person with an interest in property before dealing with the property in any way to give a copy of the *Approval* to any person who will acquire an interest in the property as a result of the dealing.

- The reason for Condition 1(18) is to ensure that appropriate Ministry staff has ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this

Approval. This Condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the *Act*, the *OWRA*, the *PA*, the *NMA* and the *SDWA*.

- Condition 1 (22) has been included in order to clarify what information may be subject to the *Freedom of Information Act.*

SITE OPERATION

- The reasons for Conditions 2(1), 2(5) and 6(3) are to ensure that the *Site* is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.

- The reason for Conditions 2 (2), 2(3) and 2(4) is to ensure that users of the *Site* are fully aware of important information and restrictions related to *Site* operations and access under this *Approval.*

- The reasons for Condition 2(6) are open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance effects, and the potential fire hazard and to make sure burning of brush and wood are carried out in accordance with *Ministry* guidelines.

- The reasons for Condition 2(7), 2(8), 2(9) and 2(10) are to specify the hours of operation for the landfill site and a mechanism for amendment of the hours of operation, as required.

- The reasons for Condition 2(11) and 2(12) are to ensure that the *Site* is supervised by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person and to ensure the controlled access and integrity of the *Site* by preventing unauthorized access when the Site is closed and no site attendant is on duty.

EMPLOYEE TRAINING

- The reason for Condition 3(1) is to ensure that the *Site* is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.

COMPLAINTS RESPONSE PROCEDURE

- The reason for Condition 4(1) is to ensure that any complaints regarding landfill operations at this *Site* are responded to in a timely and efficient manner.

EMERGENCY RESPONSE

- Conditions 5(1) and 5(2) are included to ensure that emergency situations are reported to the Ministry to ensure public health and safety and environmental protection.

- Conditions 5(3), 5(4) and 5(5) are included to ensure that emergency situations are handled in a manner to minimize the likelihood of an adverse effect and to ensure public health and safety and

environmental protection.

RECORD KEEPING AND REPORTING

- The reason for Conditions 6(1) and 6(2) is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this *Approval* (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the *EPA* and its regulations.

- The reason for Conditions 6(4) and 6(5) is to ensure that detailed records of *Site* inspections are recorded and maintained for inspection and information purposes.

- The reasons for Conditions 6(6) and 6(7) are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.

LANDFILL DESIGN AND DEVELOPMENT

- The reason for Conditions 7(1) to 7(6) inclusive is to specify the approved areas from which waste may be accepted at the *Site* and the types and amounts of waste that may be accepted for disposal at the *Site,* based on the *Owner's* application and supporting documentation.

- Condition 7(7) is to provide the *Owner* the process for getting the approval for alternative daily and intermediate cover material.

- The reasons for Condition 7(8) are to ensure that daily/weekly and intermediate cover are used to control potential nuisance effects, to facilitate vehicle access on the *Site,* and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the *Site.*

- The reasons for Condition 7(9), 7(10) and 7(11) are to ensure that waste from Universal Seal Incorporated is properly managed in order to prevent environmental detriment and to ensure the safety of the general public and site personal.

LANDFILL MONITORING

- Reasons for Condition 8(1) are to ensure that off-site migration of landfill gas is monitored and all buildings at the *Site* are free of any landfill gas accumulation, which due to a methane gas component may be explosive and thus create a danger to any persons at the *Site.*

- Condition 8(2) is included to provide the groundwater and surface water limits to prevent water pollution at the *Site.*

- Conditions 8(3) and 8(4) are included to require the Owner to demonstrate that the *Site* is performing

as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.

- Conditions 8(5), 8(6) and 8(7) are included to ensure the integrity of the groundwater monitoring network so that accurate monitoring results are achieved and the natural environment is protected.

- Conditions 8(8) to 8(11) inclusive are added to ensure the *Owner* has a plan with an organized set of procedures for identifying and responding to potential issues relating to groundwater and surface water contamination at the *Site's* compliance point.

- Conditions 8(12), 8(13) and 8(14) are included to streamline the approval of the changes to the monitoring plan.

- Condition 8(15) was included to ensure the *Owner* complete the tasks and work towards bringing the Site into compliance as proposed by the *Owner.*

CLOSURE PLAN

- The reasons for Condition 9 are to ensure that final closure of the *Site* is completed in an aesthetically pleasing manner, in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.

WASTE DIVERSION

- Condition 10 is included to ensure that the recyclable materials are stored in their temporary storage location and transferred off-site in a manner as to minimize a likelihood of an adverse effect or a hazard to the natural environment or any person.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A362301 issued on October 6, 1997

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:

a. 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;
b. 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:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. 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, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

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

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

DATED AT TORONTO this 20th day of December, 2018

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

RM/
c: Area Manager, MECP Belleville
c: District Manager, MECP Kingston - District
Iris O'Connor, BluMetric Environmental Inc.

Appendix A

A-3 MECP Groundwater Review Memo – June 2024

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

Ontario

M E M O R A N D U M

June 27, 2024

TO: Jon Morrish
Senior Environmental Officer
Belleville Area Office
Eastern Region

FROM: Obai Mohammed
Hydrogeologist
Technical Support Section
Eastern Region

RE: 2023 Annual Monitoring Report – Hickey Road WDS
Part of Lot 30, Concession 8, Geographic Township of Herschel
Township of Hastings Highlands, County of Hastings
Environmental Compliance Approval (ECA) No. A362301

Purpose

I have reviewed the hydrogeological aspects of the document entitled: "2023 Annual Monitoring Report, Hickey Road WDS, Environmental Compliance Approval No. A362301", prepared by BlueMetric Environmental Inc. (BlueMetric) on behalf of The Corporation of the Municipality of Hastings Highlands and dated March 25, 2024.

I offer the following comments for your consideration:

Environmental Compliance Approval

The Hickey Road Waste Disposal Site (the site) is operated by the Municipality of Hastings Highlands under ECA No. A362301. The site is approved for the operation of a 3.0-hectare (ha) landfill area with a total site area of 4.0 ha. The site is located on and surrounded by crown land owned by the Ministry of Natural Resources and Forestry (MNRF). It is understood that there is a 30 m buffer around the site's footprint and a proposed Contaminant Attenuation Zone (CAZ) of 1.12 ha to the south of the 4.0 ha landfill area. The site is licensed to receive domestic waste and contains recycling bins for metal, plastic, paper/cardboard products, as well as segregated areas for scrap metal, tires, large bulky items, and brush. The site has been approved to accept and dispose of waste electrical and electronic equipment. The approved volumetric capacity is noted by BlueMetric as 74,100 m^3 and the volume remaining is calculated to be 29,573 m^3 for an estimated approximately 82 years of life expectancy for the site, considering the annual volume of waste that is deposited at the site. As per the issued ECA, condition 25.1 requires a closure plan to be submitted to the Director at least 12 months prior to site closure. The site is not engineered and operates as a natural attenuation site. The site operates using the area fill method.

The ECA was amended in 2016 to address size issues at the site. It is understood that since 2020, the Municipality has been finalizing the purchase of a 4.0 ha waste site from MNRF, expected to complete in 2024, along with the transfer of a 1.12 ha CAZ easement. This process began in 2015 and required several steps, including Indigenous and Public Consultations.

In an MECP memorandum, dated November 29, 2018, I noted that “when the ECA is amended to include proper site area and attenuation area, the following conditions are recommended to be included:

- require groundwater monitoring; and,
- require compliance with Guideline B-7.

I continue to recommend including those conditions when ECA is next amended.

Site Description

The site is located at 202 Hickey Road, in Part of Lot 30, Concession 8 in the Township of Herschel (Former Monteagle Township), County of Hastings, and is accessed via Hickey Road off Highway 62. The site is surrounded by Crown land to the north, east, and south. Bird Creek is located 0.7 km to the west, un-named tributary of Bird Creek directly to the south-east of the site, O’Shaughnessy Lake 1.5 km to the northwest, and residential houses known as Hickey Settlement, is approximately 1.3 km west of the site. The area surrounding the site is generally treed, with aggregate operations were previously reported to be located to the west and northwest. Potential groundwater and surface water receptors around the site include residential houses in Hickey Settlement, 1.3 km west (low potential due to flow direction), a domestic well 1.2 km southeast, and Bird Creek Junction, 0.7 km south. The closest residence was previously noted to be located approximately 0.75 km west of the site.

Geology

The site geology was previously noted as a surficial sand with some gravel, described as glaciofluvial outwash deposits with the underlying bedrock described as predominantly clastic rocks with minor metavolcanic rocks.

Hydrogeology

In Spring 2023, groundwater flow was southward with a slight east component at a gradient of 0.015 m/m. In Fall 2023, the groundwater flow remained southward with a slight eastern component at a gradient of 0.006 m/m. These patterns are consistent with recent historical data, indicating a predominant southward flow direction.

Background Groundwater Quality

In 2023, monitoring wells HR1-03 (background) and HR3-03 (upgradient) did not exceed Ontario Drinking Water Standards, Objectives and Guidelines (ODWS) in any parameter. Both monitoring wells are considered suitable for background assessment.

Leachate

Considering historical groundwater results, dissolved organic carbon (DOC), iron, manganese, sodium, and chloride were parameters selected to characterize the leachate. Leachate monitoring well HR2-03R, within the waste footprint, showed ODWS exceedances for aluminum, DOC, iron, manganese, TDS, alkalinity, and barium.

Volatile Organic Compounds (VOCs)

Volatile organic compounds (VOCs) were last analyzed in 2017 with no VOCs were detected in groundwater samples previously. However, VOCs analysis is not included in the 2023 AMR. Future reports should provide VOCs results and analysis.

Downgradient Groundwater Quality

The 2023 groundwater chemistry results indicate that monitoring wells HR4-10 and HR5-10, located downgradient and south of the waste mound, are impacted by leachate, consistent with previous monitoring results. Elevated levels of alkalinity (HR4-10 only), DOC, iron, manganese, and TDS were also observed. Monitoring wells HR7-19 and HR8-19, installed in 2019 downgradient of HR4-10 and HR5-10, to assess natural attenuation at the site, also showed leachate impacts, particularly HR7-19. Monitoring well HR8-19 reportedly had minimal exceedances.

Monitoring wells HR9-21 and HR10-21, installed in Summer 2021 in the CAZ, showed Fall-only exceedances for manganese at HR9-21, attributed by BlueMetric to natural conditions rather than site-related impacts. These are newly installed monitors with insufficient data available, and further semi-annual data are needed for parameters' trend analysis in this to be acquired CAZ lands.

Regulatory Evaluation

Guideline B-7 applies to all operating waste disposal sites and those closed after 1986. Guideline B-7 applies to the Hickey Road WDS. BlueMetric compares the calculated Reasonable Use Concept (RUC) concentrations to the downgradient groundwater quality at monitoring wells HR4-10 and HR5-10, and HR7-19 and HR8-19 located downgradient of HR4-10 and HR5-10, as well as CAZ monitors HR9-21 and HR10-21.

Exceedances to Reasonable Use Values (RUVs) were reported at monitoring wells HR4-10 and HR5-10 for alkalinity, barium, DOC, iron, manganese, sodium (HR4-10 only), and TDS, at HR7-19 for DOC, iron, manganese, TDS, alkalinity, and barium, and at HR9-21 (Fall only) for manganese. Given the recent installed monitoring wells HR9-21 and HR10-21 are outside the property boundary, at CAZ land (to the south) under acquisition process and given monitoring well HR7-19 reported exceedances to RUVs, I conclude that the site is not in compliance with Guidelines B-7, however, with the expected acquisition of CAZ, it is likely the site will be brought back to compliance.

BlueMetric noted that the current monitoring network may need an additional well to the east and southeast boundaries, to be assessed in 2024 for Guideline B-7 compliance. I concur with BluMetric recommendation.

Domestic Water Supply Wells

A water supply wells search, conducted by BlueMetric, has reportedly identified ten (10) domestic water wells, located within 1.5 km off the site, seven (7) of which are wells located to the northwest and not in the groundwater flow direction; six (6) are drilled to 50 meters below ground surface (mbgs), or more, in the bedrock, and one (1) well is reportedly at 26 mbgs. Two (2) wells, noted to be located southwest of the site, also not in the flow direction, are drilled to 48 mbgs and 60 mbgs in the bedrock. One (1) well southeast of the site, in the groundwater flow direction, is drilled to 23 mbgs in gravel. No well information was found for the two (2) closest residences. I conclude that further information is required for those closest to the site two (2) water supply wells.

Groundwater – Surface water Interaction

The groundwater is potentially discharging to the surface at the site. The 2023 groundwater analysis results were compared to the (Provincial Water Quality Objectives) PWQO, summarized in Table 14, in the 2023 AMR. Monitoring well HR4-10 exhibited PWQO exceedances for boron, cobalt, iron, and vanadium. Results from monitors HR5-10 and HR7-19 exhibited PWQO exceedance for boron, cobalt, and iron. HR6-19 has also exhibited PWQO exceedance for cobalt and iron. While HR3-03 reportedly had only cobalt exceeding PWQO, HR2-03R exceedances to PWQO for aluminum, cobalt, iron, and vanadium were reported.

Monitoring well HR6-19 was installed to assess groundwater chemistry between the site and surface water monitoring location HR-SW1. In 2023, elevated DOC, iron, and manganese levels were noted compared to other locations, exceeding ODWS, indicating site impacts. An MECP Surface Water reviewer should continue to be consulted with respect to surface water management at this site.

Landfill Gas

Landfill gas readings were collected from monitoring wells in 2023. BlueMetric noted that the results for methane levels were generally safe, except at well HR2-03, which had an elevated reading of 82% LEL in Fall 2023. HR2-03 is centrally located, and the surrounding wells near the property boundary had safe methane levels. There are no nearby structures with basements, so the elevated methane is not considered an immediate concern, according to BlueMetric. The onsite risks associated with landfill gas associated with this site are beyond the scope of my review. Landfill gas monitoring should continue to be conducted, and safety measures should be in place for any excavation or any activities within the waste mound.

Groundwater Monitoring Program

The site is monitored semi-annually (spring and fall) for groundwater quality at ten (10) monitoring wells shown in Figure 02 included in the 2023 AMR. BlueMetric proposed a reduced semi-annual groundwater monitoring, to include a full round of water levels in both Spring and Fall events, but a partial Spring groundwater sampling for water quality at HR1-03, HR3-03, HR6-19, HR9-21, HR10-21 only, with a full groundwater sampling during the Fall. The proposed groundwater monitoring is summarized in Table 13.

I conclude that potential groundwater and surface water receptors around the site exist to the west, southeast, and Bird Creek Junction to the south. Further, the site currently is not in compliance with Guideline B-7, and the acquisition of the CAZ is still in progress. Therefore, I do not support reducing the groundwater monitoring at this point.

Trigger Mechanisms and Contingency Plans

The revised groundwater trigger mechanisms and the contingency plan are detailed in Appendix F-2, included in the 2023 AMR. The current assessment locations are HR9-21 (south CAZ boundary) and HR10-21 (west CAZ boundary), for the following parameters: barium, chloride, iron and TDS. It was noted in 2017 that the parameters are alkalinity, aluminum, chloride, DOC, iron, manganese, sodium, and TDS. While barium is added, an explanation and rational are required for reducing the trigger parameters. The proposed contingency plan includes the following:

- if three (3) or more triggers are exceeded at one sampling assessment location for two consecutive sampling events, a repeat sample to be taken within one (1) month to confirm or refuse the results at that specific assessment location.
- if three (3) or more triggers are exceeded at one assessment location and confirmed through the repeat sample as described above, the following measures will be applied: a) Increase monitoring frequency to twice monthly for four (4) months if exceedance continues, and b) If two (2) consecutive sampling results do not show exceedances and/or potential causes for elevated concentrations is identified through additional studies, revert to typical annual monitoring sampling.
- If the increased sampling indicates a continuing issue resulting in impacts or potential significant impacts to the environment, mitigation/remediation measures will be implemented to prevent further impact. The measures will aim to divert or intercept the impacted groundwater before reaching a receptor. The details and specifics of the measures to be taken will depend on the nature of the impact. I generally concur with the proposed trigger mechanisms and contingency plan.

Conclusions and Recommendations

- The groundwater flow direction at the site is primarily to the south with an easterly component, consistent with historical observations.

- Reasonable Use Guideline B-7 applies to operating waste disposal sites and those closed after 1986. Guideline B-7 applies to the Hickey Road Waste Disposal Site.

- Monitoring well HR7-19 (southern boundary), had exceedances to compliance criteria. I conclude that the site is not in compliance with Guidelines B-7. However, it is expected that the site to be in compliance once the CAZ acquisition is confirmed.

- I concur with BluMetric recommendation to add a monitoring well, in 2024, to the east and southeast boundaries for Guideline B-7 compliance in those directions.

- The downgradient monitors HR4-10 and HR5-10 are impacted by leachate, with leachate parameters' showing concentration increasing trend.

- Leachate-impacts are also evident at monitoring wells HR7-19 and HR8-19, located downgradient of HR4-10 and HR5-10.

- VOCs were last analyzed in 2017 with no detection in groundwater, and no analysis is provided in 2023. Future reports should include VOCs results and analysis.

- Monitoring wells HR9-21 showed manganese exceedance attributed to natural conditions rather than site-related impacts.

- I continue to support the recommendation in the MECP memorandum dated November 29, 2018, for groundwater monitoring and compliance with Guideline B-7 to be included as conditions in the ECA amendment.

- No well information was found for the two (2) closest residences to the site. Further information and impact analysis is required for these closest water supply wells.

- Groundwater discharges to the surface at the site. Downgradient monitors exhibited PWQO exceedances for boron, cobalt, iron, aluminum, and vanadium. Monitoring well HR6-19, located between the site and surface water station HR-SW1, showed elevated DOC, iron, and manganese in 2023, exceeding ODWS and indicating site impacts. An MECP surface water reviewer should continue to be consulted.

- Potential groundwater and surface water receptors around the site are located to the west, southeast, and Bird Creek Junction to the south. The site currently is not in compliance with Guideline B-7 and the acquisition of the CAZ is still in progress. I do not support reducing the groundwater monitoring.

- The contingency plan should be based on Guideline B-7 assessment.

- In 2017 that the trigger parameters were alkalinity, aluminum, chloride, DOC, iron, manganese, sodium, and TDS. While barium is added in 2023, an explanation and rational are required for reducing the trigger parameters.

Original signed by,

Obai Mohammed, Ph.D., P.Eng., PMP
OYM/ob

ec: Victor Castro
Christina Klein
Craig Dobiech
Dana Cruikshank

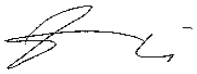
Appendix A

A-4 MECP Inspection Report – August 2025

HICKEY ROAD WASTE DISPOSAL SITE
Physical Address: 202 HICKEY RD E, , HASTINGS HIGHLANDS, ON

INSPECTION REPORT

Entity: CORPORATION OF THE MUNICIPALITY OF HASTINGS HIGHLANDS
Inspection Start Date: July 09, 2025
Site Inspection Date: July 09, 2025
Inspection End Date: August 19, 2025
Inspected By: Jon Morrish
Badge #: 847



_____
(signature)

INTRODUCTION

Purpose

This routine planned inspection was conducted at the Hickey Road Waste Waste Disposal Site (WDS, or the Site) on and about July 9, 2025. The Site was operational (Open), but closed to the public at the time of the inspection visit. The inspection visit was attended by Denver Mayhew, Operations Manager for the Municipality of Hastings Highlands (i.e. the Municipality, or the Owner), and Connor Robb and Jon Morrish of the Ministry of Environment, Conservation and Parks (MECP, or the ministry) Belleville Office. The Site is assigned Environmental Compliance Approval (ECA) Number A361602. At the time of the inspection visit, the active ECA version was dated December 20, 2018, however an amended version, dated July 19, 2025, was subsequently issued (while this inspection file review and report completion was underway). Accordingly, Site compliance is assessed against the new, active version (dated July 19, 2025).

The purpose of this inspection is to assess compliance with the conditions of the ECA, and relevant waste related policies, guidelines and legislation (including the Ontario Environmental Protection Act and Regulation 347), and the current management of the Site.

The Site is found at 202 Hickey Road in Hastings Highlands (in the former Monteagle Township), approximately 13 km north of the Town of Bancroft. It operates as a 'naturally attenuating' landfill site and has no engineering controls. The only building present is the Site attendant's office/shed. The Site is operated by the Municipality of Hastings Highlands but is located on crown land which is administered by the Ministry of Natural Resources.

All of the key conditions (i.e. requiring actions) of the ECA were reviewed. Some of the generic conditions in the ECA were not reviewed. The actual ECA should be referenced for complete wording.

Background and Compliance

The last ministry inspection at this Site was conducted on and about November 15, 2018. The associated inspection report was forwarded to the Municipality on February 4, 2019. No immediate actions (or compliance dates) were imposed in response to the report, however several outstanding action items required by the ECA were noted. In particular, the Municipality

was asked to provide any updates that became available regarding the purchase of the property from MNRF (as the Site is situated on crown land). The Municipality was also reminded of several compliance dates that were approaching...namely:
- Conditions 1 (15 and 16) of the ECA, regarding Registration on Title - by March 31, 2019 - as noted in section 6.0 of the report;
- Condition 8 (8), regarding Trigger Mechanism and Contingency Plan - by December 20, 2019 - as noted in section 2.7 of the report above;
- Condition 8 (15), regarding the proposed Action Plan (dated December 10, 2018) - with various dates for monitoring well installation (December 31, 2019), Guideline B-7 assessment (March 31, 2020), CAZ evaluation (March 31, 2021), and Groundwater Trigger Mechanism and Contingency Plan (March 31, 2020) - as noted in section 2.7 of the report;
- Condition 6 (6), regarding the 2018 Annual Report - by March 31, 2019.
An upcoming meeting, to discuss plans, was also noted.

On March 7, 2019, a meeting was held between the Municipality, the Municipality's consultant (BluMetric), MECP and MNRF, to discuss issues associated with several of the municipality's landfills (including the Hickey Road site and the Registration on Title requirements). Significantly, it was clarified that crown land (which is unpatented) could not be registered on title...and would need to be purchased (through MNR). MNRF had advised that legal surveys and land registrations can not be completed unless MNRF has agreed to an upgrade of tenure from LUP to the sale of the crown land. As such, the requirement to register a Certificate of Requirement on Title to the property was not valid and would need to be replaced during future amendments of the ECA. The necessary process, including a legal survey, was underway, and Blumetric forwarded an explanatory letter (dated April 1, 2019) to the Permissions Branch Director, to be kept on file.

The 2018 Annual Monitoring Report (AMR) for the Site stated (in section '7.7 Action Plan'): "The action plan submitted by BluMetric to the MECP (email December 10, 2018) is to be put into place in 2019. The following items were included as part of the Action Plan and address the MECP 2017 Annual Report technical review for the WDS:" In summary, the action plan outlined:
- additional monitoring wells,
- a Guideline B-7 assessment to be included in the 2019 AMR,
- a CAZ size and location assessment in the 2020 AMR,
- a new groundwater trigger mechanism and contingency plan,
- an additional surface water sampling event,
- an assessment of background water quality.
A ministry technical review (surface water-related) of the report made recommendations for incorporation into the ongoing monitoring program.

The 2019 AMR included a letter (dated March 30, 2020) and Draft Trigger Mechanism and Contingency Plan document (dated March 24, 2020) - all by BluMetric. The March 30, 2020,

letter stated:
"This letter provides the following items being provided to meet the reporting requirements under the amended ECA for the Site. The amended ECA dated December 20, 2018 stipulates under section 7 (8) (a) and (b) that within one year of the date of the approval, or by December 20, 2019 a Trigger Mechanisms and Contingency Plan is to be submitted for approval. Subsequent to the ECA amendment, the Action Plan was developed via emails, key details were provided in section 7.7 of the 2018 Annual Monitoring Report for the Site. The new proposed Trigger Mechanism and Contingency Plan are to be developed and submitted by March 31, 2020...
The attached Draft Trigger Mechanism and Contingency Plans (rev. 01) were revised and are being submitted within the 2019 Annual Monitoring Report, Appendix F and are attached to this document. These revised documents were developed in conjunction with MECP Technical Reviews."

On November 10, 2020, BluMetric reported as follows, by email:
"A DRAFT Trigger Mechanisms and Contingency Plan was submitted with the 2019 Annual Monitoring Report for Hickey Road WDS on March 31, 2020. This DRAFT document was submitted for the MECPs review and to serve as a discussion document for the purpose of revisions. The document was developed based one sampling results at the new wells HR7-19 and HR8-19.
· The trigger locations SW2 and SW3 were dry during the fall sampling event, and were confirmed dry yesterday as follow-up to the fall monitoring event.
· The fall groundwater results for the groundwater trigger locations at HR7-19 and HR8-19 when combined with the spring results would trigger the proposed Draft trigger values and would require sampling under the draft document however since this is a draft document we do not intend to initiate trigger sampling next week.
We recommend holding off contingency sampling and finalization of the DRAFT document until two more wells can be drilled along the west and south CAZ boundaries, sampled for two events and then trigger values developed for these new well locations (for the 2021 reporting on March 31, 2022). We also welcome discussions with the MECP regarding the Draft document and proposed locations for the new wells."

On November 13, 2020, the ministry (Morrish) responded as follows:
"Your summary and recommendation sound reasonable (and logical)…and I am not opposed to it. I will attach this email to the requests I've already forwarded to our Tech Support office (for review of the 2019 AMR plus Draft Trigger Mechanism and Contingency Plan)…and ask my colleagues for their input on the new well locations – when they can.
Do you know approximately when the installation of the additional wells will be scheduled for?"

Also on November 13, 2020, BluMetric (O'Connor) responded as follows:
"I am assuming the proposed additional monitoring well work at Hickey Road will not be completed until sometime next summer, but I will let the Municipality/Adrian confirm if that will

be the intent.
These will need to be included in the Municipality's 2021 budget and approved by Council before any scheduling can take place."

Also on November 13, 2020, the Municipality (Tomasini) responded, confirming that they intended to complete the additional well drilling for the Hickey WDS in 2021.

Ministry technical review comments (surface water-related) on the 2019 AMR and the Draft Surface water Trigger Mechanism and Contingency Plan dated March 2020, were provided in a memo dated November 17, 2020, and were forwarded to BluMetric and the municipality on November 20, 2020.

Ministry technical review comments (surface water-related) on the 2022 AMR were outlined in a memo dated June 7, 2023...and were forwarded to the municipality on June 26, 2023.

Ministry technical review comments (groundwater related) on the 2023 AMR were outlined in a memo dated June 27, 2024...and were forwarded to Blumetric and the municipality on July 4, 2024. Notably, the site was still considered to be out of compliance with Guideline B-7 (however compliance was expected to be attained upon the CAZ rights (and site) being acquired through MNRF). A reduction in groundwater monitoring was not supported at the time. Blumetric provided responses on July 18, 2024, which were found to be acceptable. An application to amend the ECA, in order to formally approve the revised Groundwater and Surface Water Trigger Mechanisms and Contingency Plans (both dated September 2024) was then submitted on September 16, 2024. The resulting amended ECA was issued on July 19, 2025.

As noted in the 2024 AMR for the site, the municipality remains in the process of purchasing the crown land (i.e. the 4 ha site) from MNR, as well as transfer of an easement for the 1.12 ha CAZ. The process was reportedly in the final stages, with anticipated registration on title being completed in 2025.

NON-COMPLIANCE

The following item(s) have been identified as non-compliance, based on a "No" response captured for a legislative question(s). For additional information on each question see the Inspection Details section of the report.

Ministry Program: WASTE | **Regulated Activity:** Landfills

Item	Question	Compliance Response/Corrective Action(s)
NC-1	**Question ID:** NOL 6 Has the Crown agreed in writing to use the land as a CAZ?	No

RECOMMENDATIONS

This should not be construed as a confirmation of full conformance with all potential applicable BMPs. These inspection findings are limited to the components and/or activities that were assessed, and the legislative framework(s) that were applied. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

If you have any questions related to this inspection, please contact the signed Provincial Officer.

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
Legislative Requirement(s): EPA | 27 | (1);			
Question: Does the Open landfill site have an Environmental Compliance Approval (ECA)?			
Compliance Response(s)/Corrective Action(s)/Observation(s): Yes Amended ECA Number A362301, issued July 19, 2025.			

Question ID	NOL 2	**Question Type**	Information
Legislative Requirement(s): Not Applicable			
Question: Is this landfill on Crown land?			
Compliance Response(s)/Corrective Action(s)/Observation(s): Yes			

Question ID	NOL 4	**Question Type**	Information
Legislative Requirement(s): Not Applicable			
Question: Does the landfill have a Contaminant Attenuation Zone (CAZ)?			
Compliance Response(s)/Corrective Action(s)/Observation(s): Yes See discussion in Introduction/Background and Compliance Section.			

Question ID	NOL 5	**Question Type**	Information
Legislative Requirement(s): Not Applicable			

Question:
Is the CAZ on Crown land?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 6	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1); EPA | O. Reg. 232/98 | 4 | (1)(a);

Question:
Has the Crown agreed in writing to use the land as a CAZ?

Compliance Response(s)/Corrective Action(s)/Observation(s):
No

Question ID	NOL 12	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Does the landfill have a large enough Buffer Area as specified in the ECA or Regulation 232/98?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 13	Question Type	Information

Legislative Requirement(s):
EPA | 27 | (1);

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?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 14	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is site access limited to times when an attendant is on duty?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 15	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Does the site only receive waste from within its approved service area?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 16	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Is the site required to have a ground water monitoring program by the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 17	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is the site implementing the groundwater monitoring program as required by the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 18	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1); EPA | O. Reg. 232/98 | 25;

Question:
Are monitoring well samples taken and tested to determine the quality of the ground water?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 19	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Is the ministry concerned with the results of the samples that have been tested?

Compliance Response(s)/Corrective Action(s)/Observation(s):
No

Question ID	NOL 21	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Is the site required to manage leachate by the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
No

Question ID	NOL 24	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Is the ministry concerned with the leachate quality?

Compliance Response(s)/Corrective Action(s)/Observation(s):
No

Question ID	NOL 26	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Is the site required to manage landfill gas by the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 27	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is the site implementing the landfill gas manangement requirements in the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Landfill gas (methane) readings are being collected at the specified monitoring wells and the attendant's building.

Question ID	NOL 28	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is landfill gas managed and monitored at this site?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Landfill gas is monitored at the Site (in accordance with condition 8.1 of the ECA).

Question ID	NOL 29	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Is the ministry concerned with landfill gas at this site?

Compliance Response(s)/Corrective Action(s)/Observation(s):
No

Question ID	NOL 31	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Is the site required to have a surface water monitoring program by the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 32	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is the site implementing the surface water monitoring program as required by the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 34	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Are there water quality concerns with the results of the samples that have been tested?

Compliance Response(s)/Corrective Action(s)/Observation(s):
No

Question ID	NOL 36	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

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

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 37	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is the landfill able to accurately determine the amount of waste received?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 38	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Are all disposal operations at the site adequately and continually supervised?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 39	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Does the landfill operator have a site inspection program as required by the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 40	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Does the landfill operator have a procedure in place to address issues identified by staff during the site inspection?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 41	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is the waste being compacted adequately?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 42	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1); EPA | O. Reg. 232/98 | 7;

Question:
Is Daily cover applied to the waste at the end of each working day or as otherwise specified in the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Waste in the active fill area (active face) is covered one or two days following placement.

The Site representative agreed to have additional cover material applied to the cell/section of the landfill towards the west of the current fill area, due to the presence of uncovered waste (including protruding debris, diapers etc.

The Site representative also confirmed that a manual clean-up of windblown and animal-dispersed debris - from the peripheral area of the Site was being scheduled.

No concerns were noted with respect to the operation of the active cell/face.

Question ID	NOL 44	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is site access restricted by use of a gate, fence, or physical barrier when the site is not operating?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

A full gate is present at the front entrance.

Question ID	NOL 45	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is the waste disposal area adequately screened from public view?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 46	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1); EPA | O. Reg. 232/98 | 21;

Question:
Are daily records of site operations available at the site for at least the past 2 years or as otherwise required by the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 47	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Has the annual operations report been submitted to MECP or available on site as required by the ECA?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 48	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1); EPA | O. Reg. 232/98 | 23;

Question:
Is scavenging being prevented?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 51	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is the landfill only accepting the types of waste that they are approved to receive?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

No unapproved waste categories or classes were observed during the inspection.

Question ID	NOL 52	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Does the landfill have a waste refusal procedure in place to manage waste that arrives at the site that the site is not approved the accept?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 53	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
is the waste refusal procedure being followed?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 56	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Is there an ECA condition requiring financial assurance?

Compliance Response(s)/Corrective Action(s)/Observation(s):
No

Question ID	NOL 59	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Does the landfill have a procedure in place to address complaints?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 61	Question Type	Information

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Has the landfill operator developed a Design and Operations Manual?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

The Development and Operations Plan (prepared by BluMetric Environmental) is dated January 2018.

Question ID	NOL 62	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Is the Design and Operations Manual up to date?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	NOL 63	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Does the landfill operator have training procedures for site personnel?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Staff training is provided annually by Cambium Environmental.

Question ID	NOL 64	Question Type	Legislative

Legislative Requirement(s):
EPA | 27 | (1);

Question:
Is the landfill operator following the established training procedures?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Yes

Question ID	949100	Question Type	Legislative

Legislative Requirement(s):
Not Applicable

Question:
Were the inspection questions sufficient to address other identified non-compliance items?

Compliance Response(s)/Corrective Action(s)/Observation(s):

Appendix A

A-5 MECP Inspection Correspondence – August 2025

Ministry of the Environment, Conservation and Parks

Eastern Region
Belleville Area Office
345 College Street East
Belleville ON K8N 5S7
Tel.: (613) 848-0853
Or 1-800-860-2763

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

Region de l'Est
Bureau du secteur de Belleville
345, rue College Est
Belleville (Ontario) K8N 5S7
Tel.: 613-848-0853
Ou 1-800-860-2763

August 20, 2025

Denver Mayhew
Operations Manager
The Municipality of Hastings Highlands
33011 Hwy 62N
P.O. Box 130
Maynooth, ON K0L 2S0
Via email – dmayhew@hastingshighlands.ca

RE: Environmental Compliance Inspection (Solid Non-Hazardous Waste), Hickey Road Waste Disposal Site, 202 Hickey Road, Hastings Highlands
Event Number 1-1524311841

Thank you for your time and cooperation in relation to the above-referenced inspection, which I conducted on and about July 9, 2025. A copy of the associated Inspection Report is attached, but please pay particular attention to this letter which summarizes any actions that must be addressed by your organization.

No response to the inspection report or this letter is required at this time. However as you know, the Hickey Road WDS remains out of compliance with respect to acquisition of the crown land (i.e. transfer of the 4 ha Site and an easement for the 1.2 ha Contaminant Attenuation Zone (CAZ)). It understood that the process is in the final stages, with anticipated registration on title being completed in 2025.

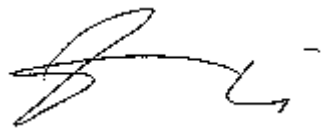
In relation to the land acquisition and easement, errors previously identified in the ECA with respect to the registration on title (Certificates of Requirement) of unpatented crown land, appear to have been reproduced in the recently amended version (dated July 19, 2025) – by requiring (in condition 1(15)) the submission of a Certificate of Requirement within 30 days of issuance of the ECA for the landfill Site. However, note that Condition 1(16), which pertains to the registration of the CAZ on title, is to be done 30 days following the establishment of the CAZ in fee simple or by way of a groundwater easement (in other words, upon acquiring rights to the CAZ).

Also, in condition 16 of the current ECA, the third and fourth paragraphs are incorrectly labelled (as 'a' and 'c', instead of 'c' and 'd'). This should be corrected at the time of the next amendment.

No other significant concerns were noted with respect to the operation of the Site, although continued clean-up of litter (as recommended in the Annual Report), and placement of additional cover material on the previous waste cell, was recommended.

Don’t hesitate to contact me (at jon.morrish@ontario.ca or by telephone at 613-848-0853) if you have any questions.

Thank you,



Jon Morrish
Provincial Officer
Badge No. 847
Drinking Water and Environmental Compliance Division
Belleville Area Office

Attachments: Inspection Report

Appendix B

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 (WDS) Name	Hickey Rd. Waste Disposal Site
Location (e.g. street address, lot, concession)	202 Hickey Road
GPS Location (taken within the property boundary at front gate/ front entry)	273138 m E, 5005376 m N
Municipality	Municipality of Hastings Highlands
Client and/or Site Owner	Municipality of Hastings Highlands
Monitoring Period (Year)	2025
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	A362301
Director's Order No.:	
Provincial Officer's Order No.:	

Other:			
Report Submission Frequency	(•) **Annual** ( ) **Other**	Due on March 31st in the year following the reporting period.	
The site is: **(Operation Status)**	(•) **Open** ( ) **Inactive** ( ) **Closed**		
Is there an active waste transfer station at the site?	(•) **Yes** ( ) **No**		
Does this WDS have a Closure Plan?	(•) **Not yet submitted** ( ) **Submitted and under review** ( ) **Submitted and approved**		
Total Approved Capacity	74100	*Units*	Cubic Metres
Maximum Approved Fill Rate	0	*Units*	
Total Waste Received within Monitoring Period (Year)	158.7	*Units*	Tonnes
Total Waste Received within Monitoring Period (Year) *Describe the methodology used to determine this quantity*	Estimated based on bag counts and assumed mass per bag and contracting tonnages.		
Estimated Remaining Capacity	28,602	*Units*	Cubic Metres
Estimated Remaining Capacity *Describe the methodology used to determine this quantity*	UAV topographic survey in June 2023 with estimated bag counts and assumed mass per bag and c		
Estimated Remaining Capacity *Date Last Determined*	31-Dec-2025		
Non-Hazardous Approved Waste Types	[x] Domestic [x] Industrial, Commercial & Institutional (IC&I) [ ] Source Separated Organics (Green Bin) [x] Tires	[ ] Contaminated Soil [x] Wood Waste [x] Blue Box Material [ ] Processed Organics [x] Leaf and Yard Waste	[ ] Food Processing/Preparation Operations Waste [ ] Hauled Sewage Other:
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*			

Year Site Opened *(enter the Calendar Year only)*		**Current ECA Issue Date**	19/07/2025
Is your Site required to submit Financial Assurance?		○ **Yes** ◉ **No**	
Describe how your WDS is designed.		◉ Natural Attenuation only ○ Fully engineered Facility ○ Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		◉ **Yes** ○ **No**	
If closed, specify ECA, control or authorizing document closure date:		Select Date	
Has the nature of the operations at the site changed during this monitoring period?	○ **Yes** ◉ **No**		
If yes, provide details:			

Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)	○ Yes ◉ No

Groundwater WDS Verification:

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

Sampling and Monitoring Program Status:

1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:	○ **Yes** ◉ **No**	Based on the inferred groundwater flow direction towards the south with a slight east component, the current groundwater monitoring network may not be adequately addressing potential groundwater impacts along the east and southeast property limit. An additional groundwater monitoring well is recommended along the southeast site boundary.
2) All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA or other relevant authorizing/ control document(s):	○ **Yes** ◉ **No** ○ **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
HR1-03	Insufficient water to sample	22-Oct-2025
HR6-19	Insufficient water to sample	22-Oct-2025

3) a) Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document.	○ **Yes** ◉ **No** ○ **Not Applicable**	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	○ **Yes** ○ **No** ◉ **Not Applicable**	If no, list exceptions below or attach additional information.

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

4) All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	(●) **Yes** ( ) **No**	If no, specify (Type Here):
Sampling and Monitoring Program Results/WDS Conditions and Assessment:		
5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/ or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.	(●) **Yes** ( ) **No**	The current CAZ appears to be of adequate size; however, groundwater quality along the east and southeast property boundaries is unknown and must be investigated prior to further assessing the CAZ.
6) The site meets compliance and assessment criteria.	( ) **Yes** (●) **No**	The WDS will be considered to be compliant with Guideline B-7 along the south and west CAZ boundaries, following the formal easement and registration of the CAZ lands. It is unknown if the WDS is compliant with Guideline B-7 along the east and southeast property boundaries.
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.*** **The site has developed stable leachate mound(s) and stable leachate plume geometry/ concentrations; and** ***ii.*** **Seasonal and annual water levels and water quality fluctuations are well understood.**	○ **Yes** ◉ **No**	**Note which practice(s):**	☐ **(a)** ☐ **(b)** ☐ **(c)**
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	○ **Yes** ◉ **No** ○ **Not Applicable**	Groundwater Trigger Mechanisms and Contingency plan was accepted in the July 19, 2025 ECA amendment. Revised surface water trigger mechanisms and contingency plan was accepted in the July 19, 2025 ECA amendment.	

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 Environmental Compliance 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.

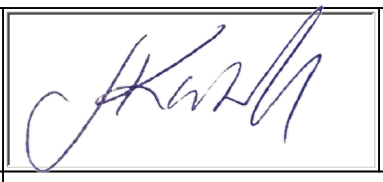
If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances 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:

18-Mar-2026

Recommendations:

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

○ **No changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/ are recommended:**	The current groundwater monitoring network may not be adequately addressing potential groundwater impacts along the east and southeast property limit. An additional groundwater monitoring well is recommended. As per the MECP review of the 2023 Annual Monitoring Report, future monitoring should include Volatile Organic Compounds (VOCs) analysis for groundwater.
○ **No Changes to site design and operation are recommended**	
◉ **The following change(s) to the site design and operation is/are recommended:**	Complete the acquisition and secure easement rights for the CAZ, and formally register the CAZ lands for the Site.
Name:	Jaclyn Kalesnikoff, B.Sc., P.Geo.
Seal:	

Signature:		**Date:**	25-Mar-2026
CEP Contact Information:	Jaclyn Kalesnikoff, B.Sc., P.Geo.		
Company:	BluMetric Environmental Inc.		
Address:	1682 Woodward Drive Ottawa, ON K2C 3R8		
Telephone No.:	(877)-487-8436 ext. 339	Fax No. :	(877)-487-8436
E-mail Address:	jkalesnikoff@blumetric.ca		
Co-signers for additional expertise provided:			
Signature:		**Date:**	
Signature:		**Date:**	

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):	
Name (s)	Bird Creek, Un-named tributary

Distance(s)	0.7 km to the south, 0.125 km southeast

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

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	◉ **Yes** ○ **No**	
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the ECA or relevant authorizing/control document(s) (if applicable):	○ **Yes** ◉ **No** ○ **Not applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
HR-SW1, HR-SW2, HR-SW3, HR-SW4	Dry conditions were observed on October 22, 2025.	Fall 2025

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry ECA or authorizing/control document.	○ **Yes** ◉ **No** ○ **Not Applicable**	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:	○ **Yes** ○ **No** ◉ **Not Applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

4) All field work for surface water investigations was done in accordance with SOP, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	◉ **Yes** ○ **No**	If no, specify (Type Here):

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

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

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table on the following page 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. ECA limit, PWQO, background	e.g. X% above PWQO
Dissolved Aluminum at HR-SW4	Calculated PWQO	5% above PWQO
Copper at HR-SW4	Calculated PWQO	110% above PWQO
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	(●) **Yes** ( ) **No**	The two exceedances listed above are at a background location (HR-SW4). It is unlikely that impacted groundwater at the WDS is discharging to the location of HR-SW4 based on the respective water elevations at HR-SW4 and closest monitoring well HR6-19. As a result, these exceedances are likely related to non-WDS influences.

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**	Spatial and/or temporal variation in water quality is observed at all surface water monitoring locations but no evidence of increasing trends is observed.
8) For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g. , PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):	◉ Yes ○ No ○ Not Known ○ Not Applicable	It is unlikely that impacted groundwater at the WDS is discharging to the locations of HR-SW1 and HR-SW4 based on the respective water elevations at HR-SW1, HR-SW4 and nearby HR6-19. Groundwater interaction with surface water at HR-SW2 and HR-SW3 seems unlikely due to the water table depth in proximal wells: approximately 5.3 mbgs at HR7-19 and approximately 4.2 mbgs at HR9-21.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	○ **Yes** ◉ **No** ○ **Not Applicable**	The surface water chemical results in 2025 did not trigger the Tier 1 Contingency Plan response for surface water.

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 Environmental Compliance 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.

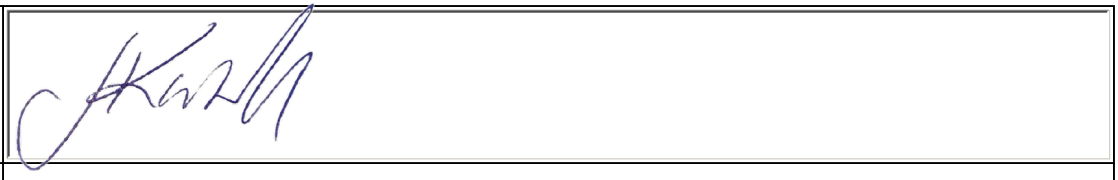
If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the 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:

18-Mar-2026

Recommendations:

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

○ **No Changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/are recommended:**	Consideration should be given to conducting the fall monitoring event earlier in the season or during late summer to increase the likelihood of obtaining a second sampling event.
◉ **No changes to the site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/ are recommended:**	

CEP Signature	
Relevant Discipline	Hydrogeology
Date:	25-Mar-2026
CEP Contact Information:	Jaclyn Kalesnikoff, B.Sc., P.Geo.
Company:	BluMetric Environmental Inc.
Address:	1682 Woodward Drive Ottawa, ON K2C 3R8
Telephone No.:	(877) 487 - 8436 ext. 339
Fax No. :	(877)-487-8436
E-mail Address:	jkalesnikoff@blumetric.ca

Save As		**Print Form**

Appendix C

Groundwater Monitoring Well Logs

Project No: KB1946-5

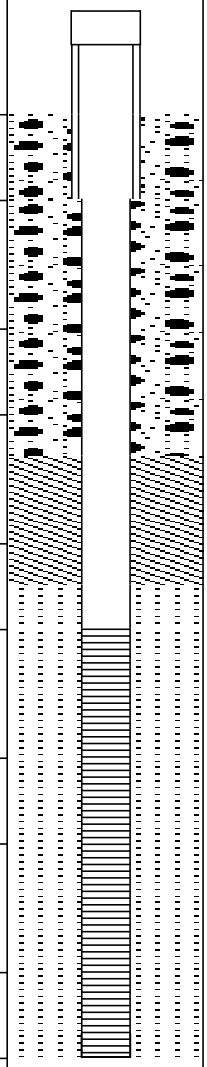
Project: Hickey Road WDS

Client: Municipality of Hastings Highlands

Site Coordinates: Zone 18 T North 5005343, East 273268

Log of Borehole: HR1-03

Field Personnel: B. M.

SUBSURFACE PROFILE				SAMPLE				WELL INSTALLATION	
Depth (ft / m)	Elevation	Symbol	Description	Number	Type	SPT N-Value	Recovery	Well Construction	Comments
0 / 0	100.49		Ground Surface						Steel locking protective cover and casing Stick-up: 0.73m
0 – 3 / 0 – 1			Brown SAND, trace small gravel, dry.	SS1	SS	7	16"		
3 – 6 / 1 – 2				SS2	SS	29	16"		51mm (2") I.D. Sch. 40 PVC pipe Native backfill
6 – 10 / 2 – 3	97.44								3/8" Bentonite holeplug
10 – 14 / 3 – 4	95.92		Brown SAND, dry.	SS3	SS	14	18"		#3 Silica sand pack
14 – 16 / 4 – 5			Brown SAND to grey SILTY SAND, wet to saturated.	SS4	SS	7	11"		10' Slot 10 PVC screen (2")
16 – 20 / 5 – 6	94.39								
20 – 21 / 6			Grey Silty SAND to SAND and GRAVEL, wet to saturated.	SS5	SS	32	10"		
21 – 22 / 6 – 7	93.78		End of Borehole						

Drill Method: 8" Hollow Stem Auger

Hole Size: 8" (205mm)

Drill Date: July 21/03

Datum: Elevation TPVC - 101.22 m

Checked by:

Sheet: 1 of 1

Project No: KB1946-5

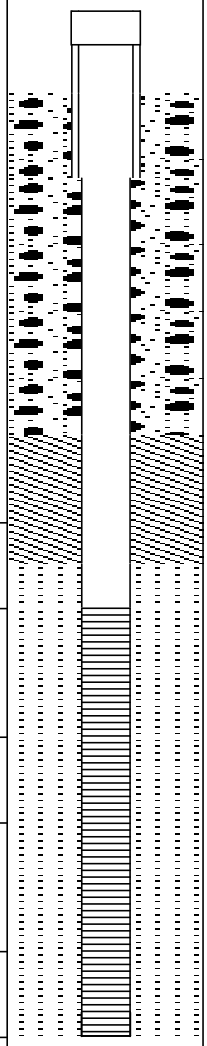
Project: Hickey Road WDS

Client: Municipality of Hastings Highlands

Site Coordinates: Zone 18 T North 5005299, East 273288

Log of Borehole: HR2-03

Field Personnel: B. M.

SUBSURFACE PROFILE				SAMPLE				WELL INSTALLATION	
Depth (ft / m)	Elevation	Symbol	Description	Number	Type	SPT N-Value	Recovery	Well Construction	Comments
0	99.64		Ground Surface						Steel locking protective cover and casing Stick-up: 0.58m
0 – 3			SAND mixed with GARBAGE (plastic, metal).						51mm (2") I.D. Sch. 40 PVC pipe Native backfill 3/8" Bentonite holeplug
3	96.59		Brown SAND with trace Gravel, dry.	SS1	SS	13	16"		#3 Silica sand pack
4 – 5	95.07		Brown SAND with trace Gravel, wet to saturated.	SS2	SS	14	10"		10' Slot 10 PVC screen (2")
6	93.54		Brown SAND, saturated.	SS3	SS	13			
7	92.93		End of Borehole						

Drill Method: 8" Hollow Stem Auger

Hole Size: 8" (205mm)

Drill Date: July 21/03

Datum: Elevation TPVC - 100.22 m

Checked by:

Sheet: 1 of 1

Project No: KB5082-05

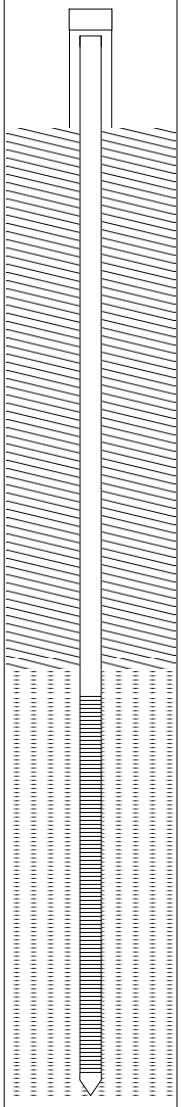
Project: Hickey Road WDS

Client: Municipality of Hastings Highlands

Site Coordinates: Zone 18 T North 5005259, East 273284

Log of Borehole: HR2-03 R

Field Personnel: B. M.

SUBSURFACE PROFILE				SAMPLE				WELL INSTALLATION	
Depth (ft / m)	Elevation	Symbol	Description	Number	Type	SPT N-Value	Recovery	Well Construction	Comments
-3 / -1	0.00		Ground Surface						Steel locking protective cover and casing PVC S/U - 0.60m
1			HR2-03 damaged by vehicle traffic.						
3			Replacement Monitor Drilling Detail:						51mm (2") I.D. Sch. 40 PVC pipe
5			Protective casing and top section of PVC pipe removed.						
7 / 2									Bentonite Holeplug
9			Centred augers over existing hole and overdrilled to depth.						
11			Drilled to refusal at 24'6" on assumed bedrock/boulder. Original bottom depth was 22'.						
13 / 4									
15			Replacement Monitor installed as detailed.						
17			Protective cement barrier installed around monitor.						
19 / 6									#3 Silica sand pack
21			MOE Well Tag A163241						10' Slot 10 PVC screen (2")
23	-7.41								
25			End of Borehole						

Drill Method: 8" Hollow Stem Auger

Hole Size: 8" (205mm)

Drill Date: January 5, 2016

Ground Elevation: 0

T.O.P.:

Static WL:

Checked by:

Sheet: 1 of 1

Project No: KB1946-5

Project: Hickey Road WDS

Client: Municipality of Hastings Highlands

Site Coordinates: Zone 18 T North 5005379, East 273159

Log of Borehole: HR3-03

Field Personnel: B. M.

SUBSURFACE PROFILE				SAMPLE				WELL INSTALLATION	
Depth (ft / m)	Elevation	Symbol	Description	Number	Type	SPT N-Value	Recovery	Well Construction	Comments
0	101.11		Ground Surface						Steel locking protective cover and casing Stick-up: 0.53m
0 – 3			Brown SAND, trace Gravel, dry.						51mm (2") I.D. Sch. 40 PVC pipe
3 – 6				SS1	SS	15	15"		Native backfill
3	98.06								3/8" Bentonite holeplug
3 – 4			Brown SAND, dry.	SS2	SS	18	17"		
4	96.54								#3 Silica sand pack
4 – 6			Brown SAND, wet to saturated.	SS3	SS	18	15"		10' Slot 10 PVC screen (2")
6	95.01								
6	94.40		Brown SAND, saturated.	SS4	SS	9	18"		
7			End of Borehole						

Drill Method: 8" Hollow Stem Auger

Hole Size: 8" (205mm)

Drill Date: July 21/03

Datum: Elevation TPVC - 101.64 m

Checked by:

Sheet: 1 of 1

Project No: KB1946-5

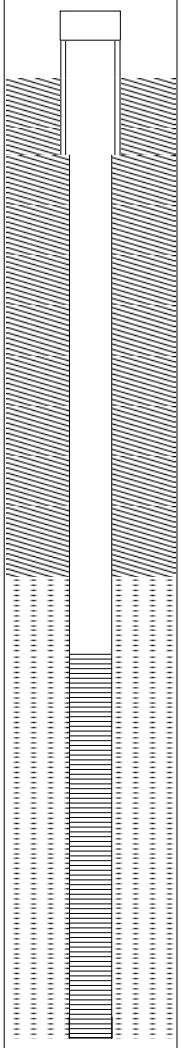
Project: Hickey Road WDS

Client: Municipality of Hastings Highlands

Site Coordinates: Zone 18 T North 5005255, East 273244

Log of Borehole: HR4-10

Field Personnel: B. M.

SUBSURFACE PROFILE				SAMPLE				WELL INSTALLATION	
Depth (ft / m)	Elevation	Symbol	Description	Number	Type	SPT N-Value	Recovery	Well Construction	Comments
-3 / -1	100.39		Ground Surface						Steel locking protective cover and casing PVC S/U - 0.72m
1	99.78		Brown Sandy TOPSOIL - some organics						
3 / 5 / 7 / 2			Brown SAND, dry.						51mm (2") I.D. Sch. 40 PVC pipe Bentonite Holeplug
9	97.34								
11 / 13 / 4			Brown SAND, dry to moist						
15	95.82								
17	95.21		Brown SAND, moist to wet						#3 Silica sand pack
19 / 6	94.29		Brown SAND, trace small gravel, wet to saturated						10' Slot 10 PVC screen (2")
21 / 23			Grey/Brown SAND, trace small gravel, saturated						
25	92.77		End of Borehole						

Drill Method: 8" Hollow Stem Auger

Hole Size: 8" (205mm)

Drill Date: April 21, 2010

Ground Elevation: 100.39

T.O.P.:

Static WL:

Checked by:

Sheet: 1 of 1

Project No: KB1946-5

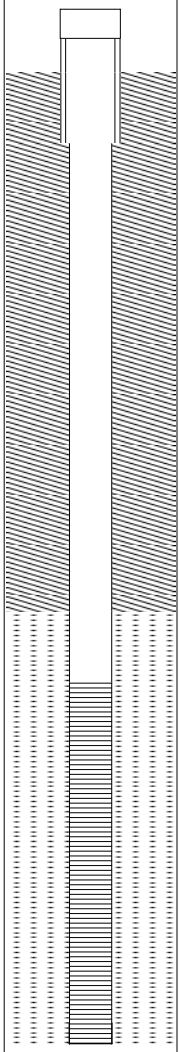
Project: Hickey Road WDS

Client: Municipality of Hastings Highlands

Site Coordinates: Zone 18 T North 5005259, East 273284

Log of Borehole: HR5-10

Field Personnel: B. M.

SUBSURFACE PROFILE				SAMPLE				WELL INSTALLATION	
Depth (ft / m)	Elevation	Symbol	Description	Number	Type	SPT N-Value	Recovery	Well Construction	Comments
-3 / -1	100.59		Ground Surface						Steel locking protective cover and casing PVC S/U - 0.78m
1 / 3	99.06		Brown SAND - trace organics near surface, dry						51mm (2") I.D. Sch. 40 PVC pipe
5 / 7 / 2	97.54		Brown SAND, dry.						Bentonite Holeplug
9 / 11 / 13 / 4	96.02		Grey/Brown SAND, dry to moist						
15 / 17 / 19 / 6	94.49		Grey/Brown SAND - trace small gravel, moist to wet						#3 Silica sand pack
21 / 23 / 25 / 8	92.36		Grey/Brown SAND, trace gravel, saturated						10' Slot 10 PVC screen (2")
27			End of Borehole						

Drill Method: 8" Hollow Stem Auger

Hole Size: 8" (205mm)

Drill Date: April 21, 2010

Ground Elevation: 100.588

T.O.P.:

Static WL:

Checked by:

Sheet: 1 of 1

Well ID: HR6-19

Project No.: 190495-03
Client: Municipality of Hastings Highlands
Report: 2019 Monitoing well Installations
Site Address: Hickey Road W.D.S.
202 Hickey Rd. East, Maynooth, Ontario

Elevation Ground: *362.57 m*
TOP: *363.34 m*
MOECC Well Tag: A259052
UTM NAD83 (Zone 18T): 5005336 N
273359 E

Depth (m)	Description	Depth (m) / Elev. (m.a.s.l.)	Notes
	Ground Surface	0.00 / 362.57	4 in. sq. steel monument with lock PVC Stickup = 0.79m
0	**Sand Fill** Light brown, dry.		
1			
2	- medium browm, dry, trace waste (wood, plastic).		bentonite gravel seal
3		3.05 / 359.52	
	Waste Dry, sand and waste (wood, plastic, metal).		
4			
5	- plastic waste. - wet.		
6			3.05m x 50mm slot 10 PVC screen within No. 2 silica sand pack
7		7.52 / 355.05	
	End of well at 7.52 m		
8	Well Completion Details: Screened interval from 4.47 m to 7.52 m below surface Elevation at top of pipe (TOP) = 363.34 m		

SUBSURFACE PROFILE | SAMPLE | WELL COMPLETION

Sample ID | Type | Blow Counts | Recovery (%) | Lab Analysis | Headspace Vapour Level (ppm) 10 100 1000 10000 | Construction

Drill Date: 2019 July 15
Drilled By: Canadian Environmental Drilling
Drilling Method: Hollow Stem Auger
Hole Diameter: 0.2 m (OD)
Datum: HR-BM2 367.80 m
Logged By: B.M.
Checked By: I.O'C.

Notes: AUGER SAMPLE

Sheet 1 of 1

BH MW OB LOGV1.0 190495-03 HICKEY ROAD.GPJ WESA TEMPLATE V1.2.GDT 20-3-5

Well ID: HR7-19

Project No.: 190495-03
Client: Municipality of Hastings Highlands
Report: 2019 Monitoing well Installations
Site Address: Hickey Road W.D.S.
202 Hickey Rd. East, Maynooth, Ontario

Elevation Ground: *361.30 m*
TOP: *362.09 m*

UTM NAD83 (Zone 18T): 5005201 N
273298 E

SUBSURFACE PROFILE | SAMPLE | WELL COMPLETION

Depth (m)	Description	Depth (m) / Elev. (m.a.s.l.)	Notes
	Ground Surface	0.00 / 361.30	4 in. sq. steel monument with lock PVC Stickup = 0.78m
0	**Sand** Light brown, dry.		
1			
	- medium brown, dry.		
2			bentonite gravel seal
3	- moist		
4			
	- wet		
5			
6	- brown/grey, saturated.		3.05m x 50mm slot 10 PVC screen within No. 2 silica sand pack
7		7.62 / 353.68	
	End of well at 7.62 m		
8	Well Completion Details: Screened interval from 4.57 m to 7.62 m below surface Elevation at top of pipe (TOP) = 362.09 m		

Sample ID | Type | Blow Counts | Recovery (%) | Lab Analysis | Headspace Vapour Level (ppm) 10 100 1000 10000 | Construction

Drill Date: 2019 July 15
Drilled By: Canadian Environmental Drilling
Drilling Method: Hollow Stem Auger
Hole Diameter: 0.2 m (OD)
Datum: HR-BM2 367.80 m
Logged By: B.M.
Checked By: I.O'C.

Notes: AUGER SAMPLE

Sheet 1 of 1

BH MW OB LOGV1.0 190495-03 HICKEY ROAD.GPJ WESA TEMPLATE V1.2.GDT 20-3-5

Well ID: HR8-19

Project No.: 190495-03
Client: Municipality of Hastings Highlands
Report: 2019 Monitoing well Installations
Site Address: Hickey Road W.D.S.
202 Hickey Rd. East, Maynooth, Ontario

Elevation Ground: *360.11 m*
TOP: *360.89 m*

UTM NAD83 (Zone 18T): 5005213 N
273243 E

SUBSURFACE PROFILE | SAMPLE | WELL COMPLETION

Depth (m)	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm) 10 100 1000 10000	Construction	Notes
										4 in. sq. steel monument with lock
										PVC Stickup = 0.77m
0	Ground Surface	0.00 / 360.11								
0	**Sand** Light brown, dry, trace roots fibres.									
1										
2										bentonite gravel seal
3										
4										
4	- light brownish grey, saturated.									
5										
6										3.05m x 50mm slot 10 PVC screen within No. 2 silica sand pack
7										native soil collaspe
7		7.62 / 352.49								
8	End of well at 7.62 m Well Completion Details: Screened interval from 4.23 m to 7.28 m below surface Elevation at top of pipe (TOP) = 360.89 m									

Drill Date: 2019 July 15
Drilled By: Canadian Environmental Drilling
Drilling Method: Hollow Stem Auger
Hole Diameter: 0.2 m (OD)
Datum: HR-BM2 367.80 m
Logged By: B.M.
Checked By: I.O'C.

Notes: AUGER SAMPLE

Sheet 1 of 1

BH MW OB LOGV1.0 190495-03 HICKEY ROAD.GPJ WESA TEMPLATE V1.2.GDT 20-3-5

Monitoring Well ID: HR9-21

Project No.: 210217-02
Client: Municipality of Hastings Highlands
Report: Hickey Road WDS
Site Address: 202 Hickey Road East, Maynooth, ON

Elevation Ground: *359.67 m*
TOP: *360.51 m*

UTM NAD-83 (Zone 18): 5005132.000 N, 273305.000 E

SUBSURFACE PROFILE					SAMPLE						WELL COMPLETION	
Depth (m)	Elevation (m)	Symbol	Description	Depth (m) / Elev. (m.a.s.l.)	Type	Recovery (%)	Blow Counts	Sample ID	Lab Analysis	Headspace Vapour Level PID IBL ▲ ppm	Construction	Notes
										0 0 0 0		
-1	360		Ground Surface	0.0 / 359.7								J-Plug; Monument Well Casing Stickup
0			**GRAVELLY SAND** Brown medium coarse sand with trace amounts of gravel									Granular Drainage Layer
	359											
1												
	358											
2												Bentonite Seal
	357											
3												
	356			[7.6]								
4												
	355											4.75 m bgs (354.92 m)
5												
			Saturated ▼ 5.5 m: Saturated soils									Silica Sand Filter
6	354											50 mm 010 Slot PVC Screen
	353											
7												
				7.6 / 352.1								Cuttings Backfill
	352		Observations made from auger. EOH at 7.62 mbgs.									
8												

Drill Date: 2021 August 19
Drilled By: Canadian Environmental Drilling
Drilling Method: Tri-Cone
Hole Diameter (OD):
Logged By: BM
Checked By: IO

▽ Perched Groundwater Strike / Unstabilized Groundwater Level
▼ True Groundwater Strike / Stabilized Groundwater Level

BH MW OB LOG 210217-02 HICKEY RD BH LOGS.GPJ BLUMETRIC STANDARD.GDT 22-2-1

Monitoring Well ID: HR10-21

Project No.: 210217-02
Client: Municipality of Hastings Highlands
Report: Hickey Road WDS
Site Address: 202 Hickey Road East, Maynooth, ON

Elevation Ground: *361.81 m*
TOP: *362.62 m*

UTM NAD-83 (Zone 18): 5005129.000 N, 273239.000 E

SUBSURFACE PROFILE					SAMPLE						WELL COMPLETION	
Depth (m)	Elevation (m)	Symbol	Description	Depth (m) / Elev. (m.a.s.l.)	Type	Recovery (%)	Blow Counts	Sample ID	Lab Analysis	Headspace Vapour Level PID IBL ▲ ppm 0 0 0 0	Construction	Notes
-1	362		Ground Surface	0.0 / 361.8								J-Plug; Monument Well Casing Stickup
0			**GRAVELLY SAND** Brown coarse sand with trace amounts of gravel									
1	361											Granular Drainage Layer
2	360											
3	359											
4	358											Bentonite Seal
				[9.1]								
5	357		Saturated ▼ 4.9 m: Saturated soils									
6	356											
7	355											6.66 m bgs (355.15 m); Silica Sand Filter; 50 mm 010 Slot PVC Screen
8	354											
9	353			9.1 / 352.7								
			Observations made from auger. EOH at 9.14 mbgs.									

Drill Date: 2021 August 19
Drilled By: Canadian Environmental Drilling
Drilling Method: Tri-Cone
Hole Diameter (OD):
Logged By: SD
Checked By: IO

▽ Perched Groundwater Strike / Unstabilized Groundwater Level
▼ True Groundwater Strike / Stabilized Groundwater Level

BH MW OB LOG 210217-02 HICKEY RD BH LOGS.GPJ BLUMETRIC STANDARD.GDT 22-2-1

Appendix D

Field Forms, Laboratory Reports, and Chain of Custody Records

Appendix D

D-1 Site Observation Forms

SMALL LANDFILL
OPERATION AND INSPECTION FORM

Site Name: Hickey Road WDS, MHHs	**Date:** May 7th, 2025	**Weather:** 15°C
Project #: 250253-03	**BluMetric Staff:** NW / BM	Sunny + Clouds

Photographs of each item below should be collected during site visits.

OVERALL INSPECTION AND OPERATION REVIEW

❑ Signage in good condition	Yes ✓	No _	
❑ ECA and emergency numbers on signage	Yes ✓	No _	
❑ Hour of operation observed	Yes ✓	No _	
❑ Site open under normal operating hours	Yes ✓	No _	→ closed while on-site
❑ Perimeter fencing and gate in good condition	Yes ✓	No _	
❑ Gate locked if closed	Yes ✓	No _	

DESIGNATED WASTE AREA

❑ Working active/trench area (moderate size, daily cover, compacted)	Yes ✓	No _	→ Large uncovered area of waste
❑ Designated waste areas are properly signed and easily accessed by public	Yes ✓	No _	

RECYCLING OPERATION (if applicable)

❑ Proper signage and bins present	Yes ✓	No _
❑ Clearly signed	Yes ✓	No _
❑ Overall neat in appearance	Yes ✓	No _

SEGREGATED SCRAP PILES (metal, tires, brush, etc.)

❑ Metals neat and appropriate size	Yes ✓	No _	
❑ Tires neat and appropriate size	Yes ✓	No _	
❑ Bulky Items neat and appropriate size	Yes ✓	No _	→ Large but neat
❑ Brush pile neat and appropriate size	Yes ✓	No _	
❑ Construction debris neat and appropriate size	~~Yes _~~	~~No _~~	→ Not accepted

MONITORING WELL CONDITION

❑ Casing conditions (frost heave, lock, cap)	Yes ✓	No _
❑ Monitor condition (capped, vented)	Yes ✓	No _
❑ Wells clearly labeled (re-label as required)	Yes ✓	No _
❑ Well clearly visible (clear brush if necessary)	Yes ✓	No _

LANDFILL GAS MONITORING

❑ Conducted at structures	Yes ✓	No _	* Attendants building = 0 ppm *
❑ Conducted at monitoring wells	Yes ✓	No _	

REPAIRS: Provide details of repairs made or materials required for repairs upon next site visit:

OBSERVATIONS OF PHYSICAL ENVIRONMENT: Please comment on any changes to the local environment (e.g. settling or slumping of waste/cover, new or altered drainage, presence of seeps, changes in vegetation cover, etc.)

This form is intended as a general reminder of information that should recorded during monitoring activities. The above information is a minimum guide. Any information deemed important should be recorded in the field notes for each site.



Identify any changes to site layout on drawing and/or comment:

This form is intended as a general reminder of information that should recorded during monitoring activities. The above information is a minimum guide. Any information deemed important should be recorded in the field notes for each site.

SMALL LANDFILL
OPERATION AND INSPECTION FORM

Site Name: Hickey Road WDS, MHHs	**Date:** Oct 22, 2025	**Weather:**
Project #: 250253-05	**BluMetric Staff:** BM/DK	Sun/Cloud 9°

Photographs of each item below should be collected during site visits.

OVERALL INSPECTION AND OPERATION REVIEW

❑ Signage in good condition	Yes ✓	No _
❑ ECA and emergency numbers on signage	Yes ✓	No _
❑ Hour of operation observed	Yes ✓	No _
❑ Site open under normal operating hours	Yes _	No ✓
❑ Perimeter fencing and gate in good condition	Yes ✓	No _
❑ Gate locked if closed	Yes ✓	No _

DESIGNATED WASTE AREA

❑ Working active/trench area (moderate size) daily cover, compacted)	Yes ✓	No _	Not covered/ packed
❑ Designated waste areas are properly signed and easily accessed by public	Yes _	No _	

RECYCLING OPERATION (if applicable)

❑ Proper signage and bins present	Yes ✓	No _
❑ Clearly signed	Yes ✓	No _
❑ Overall neat in appearance	Yes ✓	No _

SEGREGATED SCRAP PILES (metal, tires, brush, etc.)

❑ Metals neat and appropriate size	Yes ✓	No _	
❑ Tires neat and appropriate size	Yes ✓	No _	
❑ Bulky Items neat and appropriate size	Yes _	No ✓	Large but neat
❑ Brush pile neat and appropriate size	Yes _	No _	N/A
❑ Construction debris neat and appropriate size	Yes _	No _	

MONITORING WELL CONDITION

❑ Casing conditions (frost heave, lock, cap)	Yes ✓	No _
❑ Monitor condition (capped, vented)	Yes ✓	No _
❑ Wells clearly labeled (re-label as required)	Yes ✓	No _
❑ Well clearly visible (clear brush if necessary)	Yes ✓	No _

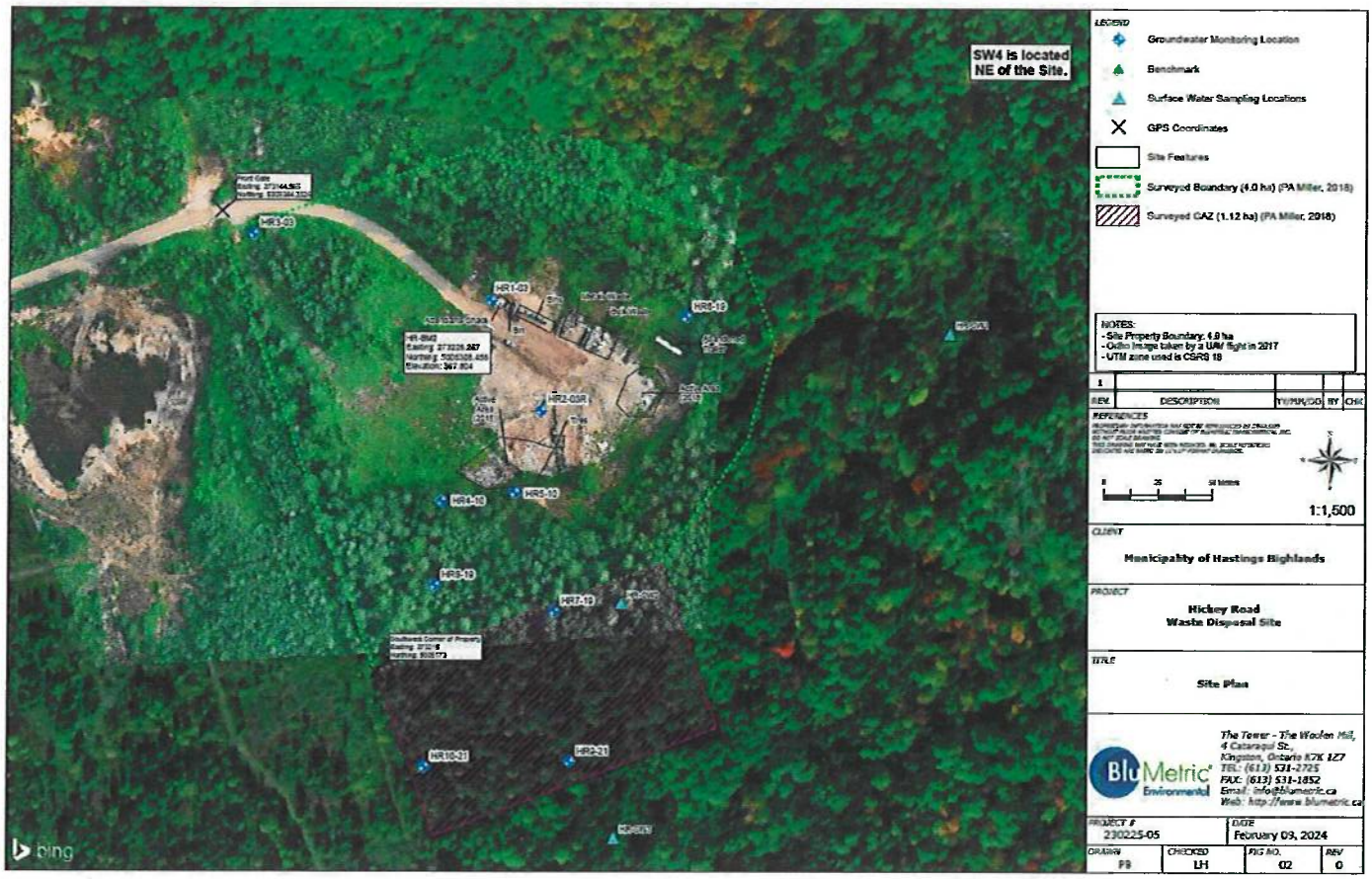
LANDFILL GAS MONITORING

❑ Conducted at structures	Yes ✓	No _	Attendant Building Oppm
❑ Conducted at monitoring wells	Yes ✓	No _	

REPAIRS: Provide details of repairs made or materials required for repairs upon next site visit:

OBSERVATIONS OF PHYSICAL ENVIRONMENT: Please comment on any changes to the local environment (e.g. settling or slumping of waste/cover, new or altered drainage, presence of seeps, changes in vegetation cover, etc.)

This form is intended as a general reminder of information that should recorded during monitoring activities. The above information is a minimum guide. Any information deemed important should be recorded in the field notes for each site.



Identify any changes to site layout on drawing and/or comment:

This form is intended as a general reminder of information that should recorded during monitoring activities. The above information is a minimum guide. Any information deemed important should be recorded in the field notes for each site.

Appendix D

D-2 Groundwater Laboratory Reports

Your Project #: 250253-05
Site Location: Hickey Road
Your C.O.C. #: C#1062815-01-01

Attention: MHH Distribution

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/10/31
Report #: R8642852
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C5D4435
Received: 2025/10/22, 19:22

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	9	N/A	2025/10/31	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	9	N/A	2025/10/29	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	9	N/A	2025/10/29	CAM SOP-00416	SM 24 5220 D m
Conductivity	9	N/A	2025/10/31	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	9	N/A	2025/10/28	CAM SOP-00446	SM 24 5310 B m
Dissolved Metals by ICPMS	8	N/A	2025/10/27	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2025/10/29	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	8	N/A	2025/10/29	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	9	N/A	2025/10/27	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	9	2025/10/27	2025/10/31	CAM SOP-00413	SM 24th - 4500H+ B
Sulphate by Automated Turbidimetry	2	N/A	2025/10/29	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	7	N/A	2025/10/30	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	4	2025/10/28	2025/10/29	CAM SOP-00428	SM 24 2540C m
Total Dissolved Solids	5	2025/10/29	2025/10/29	CAM SOP-00428	SM 24 2540C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope

Your Project #: 250253-05
Site Location: Hickey Road
Your C.O.C. #: C#1062815-01-01

Attention: MHH Distribution

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/10/31
Report #: R8642852
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C5D4435
Received: 2025/10/22, 19:22

dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(3) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Deepthi Shaji, Project Manager
Email: Deepthi.Shaji@bureauveritas.com
Phone# (905)817-5700 Ext:7065843
==========
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C5D4435
Report Date: 2025/10/31

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: Hickey Road
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AWOJ14			AWOJ14		
Sampling Date		2025/10/22 13:10			2025/10/22 13:10		
COC Number		C#1062815-01-01			C#1062815-01-01		
	UNITS	HR-QAQC-GW1	RDL	QC Batch	HR-QAQC-GW1 Lab-Dup	RDL	QC Batch
Inorganics							
Total Ammonia-N	mg/L	3.2	0.050	A041808			
Total Chemical Oxygen Demand (COD)	mg/L	24	4.0	A042129			
Conductivity	umho/cm	670	2.0	A041264			
Total Dissolved Solids	mg/L	375	10	A042026	385	10	A042026
Dissolved Organic Carbon	mg/L	11	0.4	A041655			
pH	pH	6.91		A041266			
Dissolved Sulphate (SO4)	mg/L	4.4	1.0	A041118			
Alkalinity (Total as CaCO3)	mg/L	180	1.0	A041263			
Dissolved Chloride (Cl-)	mg/L	78	1.0	A041115			
Nitrate (N)	mg/L	ND	0.10	A040935			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas ID		AWOJ15			AWOJ15		
Sampling Date		2025/10/22 13:10			2025/10/22 13:10		
COC Number		C#1062815-01-01			C#1062815-01-01		
	UNITS	HR2-03R	RDL	QC Batch	HR2-03R Lab-Dup	RDL	QC Batch
Inorganics							
Total Ammonia-N	mg/L	3.2	0.050	A041808			
Total Chemical Oxygen Demand (COD)	mg/L	27	4.0	A042129			
Conductivity	umho/cm	670	2.0	A041264			
Total Dissolved Solids	mg/L	300	10	A042018	320	10	A042018
Dissolved Organic Carbon	mg/L	11	0.4	A041680			
pH	pH	6.97		A041266			
Dissolved Sulphate (SO4)	mg/L	5.2	1.0	A041118			
Alkalinity (Total as CaCO3)	mg/L	170	1.0	A041263			
Dissolved Chloride (Cl-)	mg/L	78	1.0	A041115			
Nitrate (N)	mg/L	ND	0.10	A040935			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AWOJ16			AWOJ17		
Sampling Date		2025/10/22 12:45			2025/10/22 13:28		
COC Number		C#1062815-01-01			C#1062815-01-01		
	UNITS	HR3-03	RDL	QC Batch	HR4-10	RDL	QC Batch
Inorganics							
Total Ammonia-N	mg/L	0.051	0.050	A041808	45	0.25	A041808
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	A042129	130	8.0	A042129
Conductivity	umho/cm	140	2.0	A041264	1500	2.0	A041264
Total Dissolved Solids	mg/L	95	10	A042026	710	10	A042026
Dissolved Organic Carbon	mg/L	3.0	0.4	A041655	55	0.4	A041655
pH	pH	7.28		A041266	7.13		A041266
Dissolved Sulphate (SO4)	mg/L	4.6	1.0	A041120	38	1.0	A041118
Alkalinity (Total as CaCO3)	mg/L	39	1.0	A041263	600	1.0	A041263
Dissolved Chloride (Cl-)	mg/L	10	1.0	A041119	64	1.0	A041115
Nitrate (N)	mg/L	0.50	0.10	A040935	ND	0.10	A040935

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas ID		AWOJ18			AWOJ19		
Sampling Date		2025/10/22 13:20			2025/10/22 14:09		
COC Number		C#1062815-01-01			C#1062815-01-01		
	UNITS	HR5-10	RDL	QC Batch	HR7-19	RDL	QC Batch
Inorganics							
Total Ammonia-N	mg/L				27	0.10	A041808
Total Chemical Oxygen Demand (COD)	mg/L	61	4.0	A042129	58	4.0	A042129
Conductivity	umho/cm	960	2.0	A041264	860	2.0	A041264
Total Dissolved Solids	mg/L	530	10	A042018	415	10	A042026
Dissolved Organic Carbon	mg/L	22	0.4	A041655	24	0.4	A041655
pH	pH	6.99		A041266	7.12		A041266
Dissolved Sulphate (SO4)	mg/L	50	1.0	A041118	14	1.0	A041118
Alkalinity (Total as CaCO3)	mg/L	410	1.0	A041263	370	1.0	A041263
Dissolved Chloride (Cl-)	mg/L	30	1.0	A041115	30	1.0	A041115
Nitrate (N)	mg/L	ND	0.10	A040935	ND	0.10	A040935

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C5D4435
Report Date: 2025/10/31

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: Hickey Road
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AWOJ20			AWOJ20		
Sampling Date		2025/10/22 13:36			2025/10/22 13:36		
COC Number		C#1062815-01-01			C#1062815-01-01		
	UNITS	HR8-19	RDL	QC Batch	HR8-19 Lab-Dup	RDL	QC Batch
Inorganics							
Total Ammonia-N	mg/L	ND	0.050	A041773			
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	A042129			
Conductivity	umho/cm	73	2.0	A041264			
Total Dissolved Solids	mg/L	40	10	A042105			
Dissolved Organic Carbon	mg/L	2.0	0.4	A041680	2.0	0.4	A041680
pH	pH	7.17		A041266			
Dissolved Sulphate (SO4)	mg/L	3.0	1.0	A041120			
Alkalinity (Total as CaCO3)	mg/L	28	1.0	A041263			
Dissolved Chloride (Cl-)	mg/L	1.3	1.0	A041119			
Nitrate (N)	mg/L	0.15	0.10	A040935	0.15	0.10	A040935

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas ID		AWOJ21		AWOJ22		
Sampling Date		2025/10/22 13:58		2025/10/22 13:48		
COC Number		C#1062815-01-01		C#1062815-01-01		
	UNITS	HR9-21	QC Batch	HR10-21	RDL	QC Batch
Inorganics						
Total Ammonia-N	mg/L	ND	A041808	ND	0.050	A041808
Total Chemical Oxygen Demand (COD)	mg/L	ND	A042129	ND	4.0	A042129
Conductivity	umho/cm	39	A041264	44	2.0	A041264
Total Dissolved Solids	mg/L	ND	A042018	70	10	A042026
Dissolved Organic Carbon	mg/L	2.3	A041655	2.0	0.4	A041680
pH	pH	6.75	A041266	6.82		A041266
Dissolved Sulphate (SO4)	mg/L	4.9	A041118	5.6	1.0	A041118
Alkalinity (Total as CaCO3)	mg/L	8.4	A041263	12	1.0	A041263
Dissolved Chloride (Cl-)	mg/L	1.5	A041115	2.2	1.0	A041115
Nitrate (N)	mg/L	0.45	A040935	0.24	0.10	A040935

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C5D4435
Report Date: 2025/10/31

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: Hickey Road
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AWOJ14		AWOJ15	AWOJ16	AWOJ17		
Sampling Date		2025/10/22 13:10		2025/10/22 13:10	2025/10/22 12:45	2025/10/22 13:28		
COC Number		C#1062815-01-01		C#1062815-01-01	C#1062815-01-01	C#1062815-01-01		
	UNITS	HR-QAQC-GW1	QC Batch	HR2-03R	HR3-03	HR4-10	RDL	QC Batch
Metals								
Dissolved Aluminum (Al)	ug/L	71	A040879	70	ND	44	4.9	A040787
Dissolved Barium (Ba)	ug/L	150	A040879	150	29	800	2.0	A040787
Dissolved Beryllium (Be)	ug/L	ND	A040879	ND	ND	ND	0.40	A040787
Dissolved Boron (B)	ug/L	78	A040879	80	18	530	10	A040787
Dissolved Cadmium (Cd)	ug/L	ND	A040879	ND	ND	ND	0.090	A040787
Dissolved Calcium (Ca)	ug/L	69000	A040879	67000	15000	90000	200	A040787
Dissolved Chromium (Cr)	ug/L	ND	A040879	ND	ND	ND	5.0	A040787
Dissolved Cobalt (Co)	ug/L	7.8	A040879	7.9	0.99	59	0.50	A040787
Dissolved Copper (Cu)	ug/L	ND	A040879	ND	1.3	ND	0.90	A040787
Dissolved Iron (Fe)	ug/L	34000	A040879	34000	ND	74000	100	A040787
Dissolved Lead (Pb)	ug/L	ND	A040879	ND	ND	ND	0.50	A040787
Dissolved Magnesium (Mg)	ug/L	6700	A040879	6400	1300	20000	50	A040787
Dissolved Manganese (Mn)	ug/L	3400	A040879	3600	ND	2100	2.0	A040787
Dissolved Molybdenum (Mo)	ug/L	ND	A040879	ND	ND	0.79	0.50	A040787
Dissolved Nickel (Ni)	ug/L	1.5	A040879	1.3	ND	15	1.0	A040787
Dissolved Potassium (K)	ug/L	15000	A040879	15000	1200	57000	200	A040787
Dissolved Silicon (Si)	ug/L	6800	A040879	6500	3600	9900	50	A040787
Dissolved Silver (Ag)	ug/L	ND	A040879	ND	ND	ND	0.090	A040787
Dissolved Sodium (Na)	ug/L	29000	A040879	28000	8900	110000	100	A040787
Dissolved Strontium (Sr)	ug/L	310	A040879	310	48	510	1.0	A040787
Dissolved Thallium (Tl)	ug/L	ND	A040879	ND	ND	ND	0.050	A040787
Dissolved Titanium (Ti)	ug/L	ND	A040879	ND	ND	ND	5.0	A040787
Dissolved Vanadium (V)	ug/L	5.2	A040879	5.3	ND	8.6	0.50	A040787
Dissolved Zinc (Zn)	ug/L	16	A040879	17	ND	ND	5.0	A040787

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C5D4435
Report Date: 2025/10/31

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: Hickey Road
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AWOJ18	AWOJ19	AWOJ20	AWOJ21	AWOJ22		
Sampling Date		2025/10/22 13:20	2025/10/22 14:09	2025/10/22 13:36	2025/10/22 13:58	2025/10/22 13:48		
COC Number		C#1062815-01-01	C#1062815-01-01	C#1062815-01-01	C#1062815-01-01	C#1062815-01-01		
	UNITS	HR5-10	HR7-19	HR8-19	HR9-21	HR10-21	RDL	QC Batch
Metals								
Dissolved Aluminum (Al)	ug/L	19	21	ND	12	23	4.9	A040787
Dissolved Barium (Ba)	ug/L	300	410	8.8	12	4.3	2.0	A040787
Dissolved Beryllium (Be)	ug/L	ND	ND	ND	ND	ND	0.40	A040787
Dissolved Boron (B)	ug/L	240	530	ND	ND	ND	10	A040787
Dissolved Cadmium (Cd)	ug/L	ND	ND	ND	ND	ND	0.090	A040787
Dissolved Calcium (Ca)	ug/L	120000	76000	9600	3100	3900	200	A040787
Dissolved Chromium (Cr)	ug/L	ND	ND	ND	ND	ND	5.0	A040787
Dissolved Cobalt (Co)	ug/L	36	44	ND	ND	ND	0.50	A040787
Dissolved Copper (Cu)	ug/L	4.9	1.3	ND	ND	ND	0.90	A040787
Dissolved Iron (Fe)	ug/L	21000	44000	ND	ND	ND	100	A040787
Dissolved Lead (Pb)	ug/L	ND	ND	ND	ND	ND	0.50	A040787
Dissolved Magnesium (Mg)	ug/L	12000	10000	930	480	730	50	A040787
Dissolved Manganese (Mn)	ug/L	2300	1900	ND	5.6	ND	2.0	A040787
Dissolved Molybdenum (Mo)	ug/L	ND	1.3	ND	ND	ND	0.50	A040787
Dissolved Nickel (Ni)	ug/L	5.6	9.0	ND	ND	ND	1.0	A040787
Dissolved Potassium (K)	ug/L	12000	30000	830	1200	920	200	A040787
Dissolved Silicon (Si)	ug/L	6300	9100	4200	4600	3900	50	A040787
Dissolved Silver (Ag)	ug/L	ND	ND	ND	ND	ND	0.090	A040787
Dissolved Sodium (Na)	ug/L	35000	45000	1900	2000	2100	100	A040787
Dissolved Strontium (Sr)	ug/L	940	400	58	48	39	1.0	A040787
Dissolved Thallium (Tl)	ug/L	ND	ND	ND	ND	ND	0.050	A040787
Dissolved Titanium (Ti)	ug/L	ND	ND	ND	ND	ND	5.0	A040787
Dissolved Vanadium (V)	ug/L	1.6	4.0	ND	ND	ND	0.50	A040787
Dissolved Zinc (Zn)	ug/L	ND	ND	ND	ND	ND	5.0	A040787

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C5D4435
Report Date: 2025/10/31

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: Hickey Road
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AWOJ14
Sample ID: HR-QAQC-GW1
Matrix: Water

Collected: 2025/10/22
Shipped:
Received: 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A041263	N/A	2025/10/31	Surinder Rai
Chloride by Automated Colourimetry	SKAL	A041115	N/A	2025/10/29	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A042129	N/A	2025/10/29	Arshdeep Jagayat
Conductivity	AT	A041264	N/A	2025/10/31	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A041655	N/A	2025/10/28	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A040879	N/A	2025/10/29	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	A041808	N/A	2025/10/29	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A040935	N/A	2025/10/27	Chandra Nandlal
pH	AT	A041266	2025/10/27	2025/10/31	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A041118	N/A	2025/10/30	Massarat Jan
Total Dissolved Solids	BAL	A042026	2025/10/29	2025/10/29	Hiu Fung Yan (James)

Bureau Veritas ID: AWOJ14 Dup
Sample ID: HR-QAQC-GW1
Matrix: Water

Collected: 2025/10/22
Shipped:
Received: 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	A042026	2025/10/29	2025/10/29	Hiu Fung Yan (James)

Bureau Veritas ID: AWOJ15
Sample ID: HR2-03R
Matrix: Water

Collected: 2025/10/22
Shipped:
Received: 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A041263	N/A	2025/10/31	Surinder Rai
Chloride by Automated Colourimetry	SKAL	A041115	N/A	2025/10/29	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A042129	N/A	2025/10/29	Arshdeep Jagayat
Conductivity	AT	A041264	N/A	2025/10/31	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A041680	N/A	2025/10/28	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A040787	N/A	2025/10/27	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A041808	N/A	2025/10/29	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A040935	N/A	2025/10/27	Chandra Nandlal
pH	AT	A041266	2025/10/27	2025/10/31	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A041118	N/A	2025/10/30	Massarat Jan
Total Dissolved Solids	BAL	A042018	2025/10/28	2025/10/29	Manowalage shanika GUNASEKARA

Bureau Veritas ID: AWOJ15 Dup
Sample ID: HR2-03R
Matrix: Water

Collected: 2025/10/22
Shipped:
Received: 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	A042018	2025/10/28	2025/10/29	Manowalage shanika GUNASEKARA

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C5D4435
Report Date: 2025/10/31

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: Hickey Road
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AWOJ16
Sample ID: HR3-03
Matrix: Water

Collected: 2025/10/22
Shipped:
Received: 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A041263	N/A	2025/10/31	Surinder Rai
Chloride by Automated Colourimetry	SKAL	A041119	N/A	2025/10/29	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A042129	N/A	2025/10/29	Arshdeep Jagayat
Conductivity	AT	A041264	N/A	2025/10/31	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A041655	N/A	2025/10/28	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A040787	N/A	2025/10/27	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A041808	N/A	2025/10/29	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A040935	N/A	2025/10/27	Chandra Nandlal
pH	AT	A041266	2025/10/27	2025/10/31	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A041120	N/A	2025/10/29	Massarat Jan
Total Dissolved Solids	BAL	A042026	2025/10/29	2025/10/29	Hiu Fung Yan (James)

Bureau Veritas ID: AWOJ17
Sample ID: HR4-10
Matrix: Water

Collected: 2025/10/22
Shipped:
Received: 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A041263	N/A	2025/10/31	Surinder Rai
Chloride by Automated Colourimetry	SKAL	A041115	N/A	2025/10/29	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A042129	N/A	2025/10/29	Arshdeep Jagayat
Conductivity	AT	A041264	N/A	2025/10/31	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A041655	N/A	2025/10/28	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A040787	N/A	2025/10/27	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A041808	N/A	2025/10/29	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A040935	N/A	2025/10/27	Chandra Nandlal
pH	AT	A041266	2025/10/27	2025/10/31	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A041118	N/A	2025/10/30	Massarat Jan
Total Dissolved Solids	BAL	A042026	2025/10/29	2025/10/29	Hiu Fung Yan (James)

Bureau Veritas ID: AWOJ18
Sample ID: HR5-10
Matrix: Water

Collected: 2025/10/22
Shipped:
Received: 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A041263	N/A	2025/10/31	Surinder Rai
Chloride by Automated Colourimetry	SKAL	A041115	N/A	2025/10/29	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A042129	N/A	2025/10/29	Arshdeep Jagayat
Conductivity	AT	A041264	N/A	2025/10/31	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A041655	N/A	2025/10/28	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A040787	N/A	2025/10/27	Indira HarryPaul
Nitrate & Nitrite as Nitrogen in Water	LACH	A040935	N/A	2025/10/27	Chandra Nandlal
pH	AT	A041266	2025/10/27	2025/10/31	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A041118	N/A	2025/10/30	Massarat Jan
Total Dissolved Solids	BAL	A042018	2025/10/28	2025/10/29	Manowalage shanika GUNASEKARA

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

TEST SUMMARY

Bureau Veritas ID: AWOJ19 **Collected:** 2025/10/22
Sample ID: HR7-19 **Shipped:**
Matrix: Water **Received:** 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A041263	N/A	2025/10/31	Surinder Rai
Chloride by Automated Colourimetry	SKAL	A041115	N/A	2025/10/29	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A042129	N/A	2025/10/29	Arshdeep Jagayat
Conductivity	AT	A041264	N/A	2025/10/31	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A041655	N/A	2025/10/28	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A040787	N/A	2025/10/27	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A041808	N/A	2025/10/29	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A040935	N/A	2025/10/27	Chandra Nandlal
pH	AT	A041266	2025/10/27	2025/10/31	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A041118	N/A	2025/10/30	Massarat Jan
Total Dissolved Solids	BAL	A042026	2025/10/29	2025/10/29	Hiu Fung Yan (James)

Bureau Veritas ID: AWOJ20 **Collected:** 2025/10/22
Sample ID: HR8-19 **Shipped:**
Matrix: Water **Received:** 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A041263	N/A	2025/10/31	Surinder Rai
Chloride by Automated Colourimetry	SKAL	A041119	N/A	2025/10/29	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A042129	N/A	2025/10/29	Arshdeep Jagayat
Conductivity	AT	A041264	N/A	2025/10/31	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A041680	N/A	2025/10/28	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A040787	N/A	2025/10/27	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A041773	N/A	2025/10/29	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A040935	N/A	2025/10/27	Chandra Nandlal
pH	AT	A041266	2025/10/27	2025/10/31	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A041120	N/A	2025/10/29	Massarat Jan
Total Dissolved Solids	BAL	A042105	2025/10/28	2025/10/29	Hiu Fung Yan (James)

Bureau Veritas ID: AWOJ20 Dup **Collected:** 2025/10/22
Sample ID: HR8-19 **Shipped:**
Matrix: Water **Received:** 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A041680	N/A	2025/10/28	Gyulshen Idriz
Nitrate & Nitrite as Nitrogen in Water	LACH	A040935	N/A	2025/10/27	Chandra Nandlal

Bureau Veritas ID: AWOJ21 **Collected:** 2025/10/22
Sample ID: HR9-21 **Shipped:**
Matrix: Water **Received:** 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A041263	N/A	2025/10/31	Surinder Rai
Chloride by Automated Colourimetry	SKAL	A041115	N/A	2025/10/29	Alina Dobreanu

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C5D4435
Report Date: 2025/10/31

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: Hickey Road
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AWOJ21
Sample ID: HR9-21
Matrix: Water

Collected: 2025/10/22
Shipped:
Received: 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	A042129	N/A	2025/10/29	Arshdeep Jagayat
Conductivity	AT	A041264	N/A	2025/10/31	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A041655	N/A	2025/10/28	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A040787	N/A	2025/10/27	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A041808	N/A	2025/10/29	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A040935	N/A	2025/10/27	Chandra Nandlal
pH	AT	A041266	2025/10/27	2025/10/31	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A041118	N/A	2025/10/30	Massarat Jan
Total Dissolved Solids	BAL	A042018	2025/10/28	2025/10/29	Manowalage shanika GUNASEKARA

Bureau Veritas ID: AWOJ22
Sample ID: HR10-21
Matrix: Water

Collected: 2025/10/22
Shipped:
Received: 2025/10/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A041263	N/A	2025/10/31	Surinder Rai
Chloride by Automated Colourimetry	SKAL	A041115	N/A	2025/10/29	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A042129	N/A	2025/10/29	Arshdeep Jagayat
Conductivity	AT	A041264	N/A	2025/10/31	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A041680	N/A	2025/10/28	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A040787	N/A	2025/10/27	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A041808	N/A	2025/10/29	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A040935	N/A	2025/10/27	Chandra Nandlal
pH	AT	A041266	2025/10/27	2025/10/31	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A041118	N/A	2025/10/30	Massarat Jan
Total Dissolved Solids	BAL	A042026	2025/10/29	2025/10/29	Hiu Fung Yan (James)

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.3°C
Package 2	4.0°C

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
A040787	Dissolved Aluminum (Al)	2025/10/27	99	80 - 120	98	80 - 120	ND, RDL=4.9	ug/L	NC	20
A040787	Dissolved Barium (Ba)	2025/10/27	98	80 - 120	97	80 - 120	ND, RDL=2.0	ug/L		
A040787	Dissolved Beryllium (Be)	2025/10/27	90	80 - 120	88	80 - 120	ND, RDL=0.40	ug/L		
A040787	Dissolved Boron (B)	2025/10/27	90	80 - 120	89	80 - 120	ND, RDL=10	ug/L	3.4	20
A040787	Dissolved Cadmium (Cd)	2025/10/27	102	80 - 120	98	80 - 120	ND, RDL=0.090	ug/L		
A040787	Dissolved Calcium (Ca)	2025/10/27	NC	80 - 120	97	80 - 120	ND, RDL=200	ug/L		
A040787	Dissolved Chromium (Cr)	2025/10/27	96	80 - 120	94	80 - 120	ND, RDL=5.0	ug/L	NC	20
A040787	Dissolved Cobalt (Co)	2025/10/27	99	80 - 120	99	80 - 120	ND, RDL=0.50	ug/L		
A040787	Dissolved Copper (Cu)	2025/10/27	96	80 - 120	94	80 - 120	ND, RDL=0.90	ug/L		
A040787	Dissolved Iron (Fe)	2025/10/27	NC	80 - 120	96	80 - 120	ND, RDL=100	ug/L	0.021	20
A040787	Dissolved Lead (Pb)	2025/10/27	96	80 - 120	95	80 - 120	ND, RDL=0.50	ug/L		
A040787	Dissolved Magnesium (Mg)	2025/10/27	97	80 - 120	94	80 - 120	ND, RDL=50	ug/L		
A040787	Dissolved Manganese (Mn)	2025/10/27	101	80 - 120	98	80 - 120	ND, RDL=2.0	ug/L	2.5	20
A040787	Dissolved Molybdenum (Mo)	2025/10/27	97	80 - 120	93	80 - 120	ND, RDL=0.50	ug/L		
A040787	Dissolved Nickel (Ni)	2025/10/27	97	80 - 120	96	80 - 120	ND, RDL=1.0	ug/L		
A040787	Dissolved Potassium (K)	2025/10/27	101	80 - 120	97	80 - 120	ND, RDL=200	ug/L		
A040787	Dissolved Silicon (Si)	2025/10/27	93	80 - 120	96	80 - 120	ND, RDL=50	ug/L		
A040787	Dissolved Silver (Ag)	2025/10/27	89	80 - 120	92	80 - 120	ND, RDL=0.090	ug/L		
A040787	Dissolved Sodium (Na)	2025/10/27	NC	80 - 120	95	80 - 120	ND, RDL=100	ug/L	1.2	20
A040787	Dissolved Strontium (Sr)	2025/10/27	NC	80 - 120	100	80 - 120	ND, RDL=1.0	ug/L		
A040787	Dissolved Thallium (Tl)	2025/10/27	94	80 - 120	97	80 - 120	ND, RDL=0.050	ug/L		
A040787	Dissolved Titanium (Ti)	2025/10/27	100	80 - 120	100	80 - 120	ND, RDL=5.0	ug/L		
A040787	Dissolved Vanadium (V)	2025/10/27	100	80 - 120	96	80 - 120	ND, RDL=0.50	ug/L		
A040787	Dissolved Zinc (Zn)	2025/10/27	99	80 - 120	99	80 - 120	ND, RDL=5.0	ug/L		
A040879	Dissolved Aluminum (Al)	2025/10/29	105	80 - 120	102	80 - 120	ND, RDL=4.9	ug/L		
A040879	Dissolved Barium (Ba)	2025/10/30	NC	80 - 120	101	80 - 120	ND, RDL=2.0	ug/L	1.5	20
A040879	Dissolved Beryllium (Be)	2025/10/30	100	80 - 120	97	80 - 120	ND, RDL=0.40	ug/L	NC	20
A040879	Dissolved Boron (B)	2025/10/30	102	80 - 120	95	80 - 120	ND, RDL=10	ug/L	3.2	20
A040879	Dissolved Cadmium (Cd)	2025/10/30	101	80 - 120	99	80 - 120	ND, RDL=0.090	ug/L	NC	20
A040879	Dissolved Calcium (Ca)	2025/10/29	NC	80 - 120	103	80 - 120	ND, RDL=200	ug/L		
A040879	Dissolved Chromium (Cr)	2025/10/30	97	80 - 120	93	80 - 120	ND, RDL=5.0	ug/L	4.0	20

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
A040879	Dissolved Cobalt (Co)	2025/10/30	97	80 - 120	95	80 - 120	ND, RDL=0.50	ug/L	NC	20
A040879	Dissolved Copper (Cu)	2025/10/30	102	80 - 120	97	80 - 120	ND, RDL=0.90	ug/L	5.3	20
A040879	Dissolved Iron (Fe)	2025/10/29	96	80 - 120	94	80 - 120	ND, RDL=100	ug/L		
A040879	Dissolved Lead (Pb)	2025/10/30	96	80 - 120	99	80 - 120	ND, RDL=0.50	ug/L	NC	20
A040879	Dissolved Magnesium (Mg)	2025/10/29	98	80 - 120	93	80 - 120	ND, RDL=50	ug/L		
A040879	Dissolved Manganese (Mn)	2025/10/29	98	80 - 120	95	80 - 120	ND, RDL=2.0	ug/L		
A040879	Dissolved Molybdenum (Mo)	2025/10/30	108	80 - 120	98	80 - 120	ND, RDL=0.50	ug/L	2.3	20
A040879	Dissolved Nickel (Ni)	2025/10/30	92	80 - 120	92	80 - 120	ND, RDL=1.0	ug/L	1.2	20
A040879	Dissolved Potassium (K)	2025/10/29	NC	80 - 120	94	80 - 120	ND, RDL=200	ug/L		
A040879	Dissolved Silicon (Si)	2025/10/29	105	80 - 120	101	80 - 120	ND, RDL=50	ug/L		
A040879	Dissolved Silver (Ag)	2025/10/30	86	80 - 120	99	80 - 120	ND, RDL=0.090	ug/L	NC	20
A040879	Dissolved Sodium (Na)	2025/10/30	NC	80 - 120	92	80 - 120	ND, RDL=100	ug/L	0.76	20
A040879	Dissolved Strontium (Sr)	2025/10/29	NC	80 - 120	97	80 - 120	ND, RDL=1.0	ug/L		
A040879	Dissolved Thallium (Tl)	2025/10/30	97	80 - 120	99	80 - 120	ND, RDL=0.050	ug/L	NC	20
A040879	Dissolved Titanium (Ti)	2025/10/29	106	80 - 120	102	80 - 120	ND, RDL=5.0	ug/L		
A040879	Dissolved Vanadium (V)	2025/10/30	100	80 - 120	94	80 - 120	ND, RDL=0.50	ug/L	3.4	20
A040879	Dissolved Zinc (Zn)	2025/10/30	93	80 - 120	96	80 - 120	ND, RDL=5.0	ug/L	12	20
A040935	Nitrate (N)	2025/10/27	97	80 - 120	100	80 - 120	ND, RDL=0.10	mg/L	0.61	20
A041115	Dissolved Chloride (Cl-)	2025/10/29	88	80 - 120	93	80 - 120	ND, RDL=1.0	mg/L	3.1	20
A041118	Dissolved Sulphate (SO4)	2025/10/30	85	75 - 125	98	80 - 120	ND, RDL=1.0	mg/L	7.8	20
A041119	Dissolved Chloride (Cl-)	2025/10/29	84	80 - 120	97	80 - 120	ND, RDL=1.0	mg/L	NC	20
A041120	Dissolved Sulphate (SO4)	2025/10/29	87	75 - 125	94	80 - 120	ND, RDL=1.0	mg/L	NC	20
A041263	Alkalinity (Total as CaCO3)	2025/10/31			97	85 - 115	ND, RDL=1.0	mg/L	0.83	20
A041264	Conductivity	2025/10/31			101	85 - 115	ND, RDL=2.0	umho/cm	0.31	10
A041266	pH	2025/10/31			101	98 - 103			0.63	N/A
A041655	Dissolved Organic Carbon	2025/10/28	91	80 - 120	97	80 - 120	ND, RDL=0.4	mg/L	1.7	20
A041680	Dissolved Organic Carbon	2025/10/28	91	80 - 120	96	80 - 120	ND, RDL=0.4	mg/L	0.15	20
A041773	Total Ammonia-N	2025/10/29	99	75 - 125	101	80 - 120	ND, RDL=0.050	mg/L	2.6 (1)	20
A041808	Total Ammonia-N	2025/10/29	97	75 - 125	99	80 - 120	ND, RDL=0.050	mg/L	NC	20
A042018	Total Dissolved Solids	2025/10/29			98	80 - 120	ND, RDL=10	mg/L	6.5	20
A042026	Total Dissolved Solids	2025/10/29			102	80 - 120	ND, RDL=10	mg/L	2.6	20

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
A042105	Total Dissolved Solids	2025/10/29			105	80 - 120	ND, RDL=10	mg/L	0.13	20
A042129	Total Chemical Oxygen Demand (COD)	2025/10/29	98	80 - 120	97	80 - 120	ND, RDL=4.0	mg/L	NC	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Louise Harding, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Chemistry testing is conducted at 6740 Campobello Rd.

C5D4435
2025/10/22 19:22

Bureau Veritas
36 Antares Dr Unit 100, Nepean, Ontario Canada K2E 7W5 Tel:(613) 274-0573 Toll-free:800-563-6266 Fax:(613) 274-0574 www.bvna.com

TR

NONT-2025-10-5079

Invoice To:		Report To:		PROJECT INFORMATION:	
Company:	#1192 BluMetric Environmental Inc	Company:	#5638 BluMetric Environmental Inc	Quotation #:	C45782
Attention:	Accounts Payable	Attention:	MHH Distribution	P.O. #:	
Address:	1682 Woodward Drive Ottawa ON K2C 3R8	Address:	The Tower - The Woolen Mill 4 Cataraqui St Kingston ON K7K 1Z7	Project:	250253-05
Tel:	(613) 839-3053 Fax: (613) 839-5376	Tel:	(613) 531-2725 Fax:	Project Name:	Hickey Road
Email:	ap@blumetric.ca	E-mail:	cbandler@blumetric.ca, cmiller@blumetric.ca, edms@bl	Site #:	
				Sampled By:	BM / DK

Bottle Order #: 1062815

COC #: C#1062815-01-01

Project Manager: Deepthi Shaji

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ____	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ____ ☐ PWQO ☐ Reg 406 Table ____ ☐ Other ____	

Include Criteria on Certificate of Analysis (Y/N)?

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____
Rush Confirmation Number: ____ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): (Metals / Hg / Cr VI)	Groundwater - ODWS	# of Bottles	Comments
1		HR-GWC ~~HR1-05~~ BM GW1	25/10/22	13:10	GW	Y	✓	6	
2		HR2-03R	25/10/22	13:10	GW	Y	✓	6	
3		HR3-03	25/10/22	12:45	GW	Y	✓	6	
4		HR4-10	25/10/22	13:28	GW	Y	✓	6	
5		HR5-10	25/10/22	13:20	GW	Y	✓	6	
6		~~HR6-19~~ BM						~~6~~ BM	
7		HR7-19	25/10/22	14:09	GW	Y	✓	6	
8		HR8-19	25/10/22	13:36	GW	Y	✓	6	
9		HR9-21	25/10/22	13:58	GW	Y	✓	6	
10		HR10-21	25/10/22	13:48	GW	Y	✓	6	

* Relinquished By (Print):	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Brad McCall	2025/10/22	15:15	Dana Kavanagh Dana Kavanagh	25/10/22	15:16	
			TRodrigues TREVOR RODRIGUES	2025/10/22	19:22	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
	8 / 9 / 8	Intact		✓

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client
6/3/3 On Ice

Bureau Veritas Canada (2019) Inc.

Your P.O. #: 250253-05
Your Project #: 250253-05
Site Location: HICKEY ROAD
Your C.O.C. #: 1041555-02-01, 1041555-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/16
Report #: R8540313
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C552864
Received: 2025/05/09, 11:12

Sample Matrix: Water
Samples Received: 11

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	10	N/A	2025/05/14	CAM SOP-00448	SM 24 2320 B m
Alkalinity	1	N/A	2025/05/16	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	1	N/A	2025/05/14	CAM SOP-00463	SM 24 4500-Cl E m
Chloride by Automated Colourimetry	9	N/A	2025/05/15	CAM SOP-00463	SM 24 4500-Cl E m
Chloride by Automated Colourimetry	1	N/A	2025/05/16	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	11	N/A	2025/05/14	CAM SOP-00416	SM 24 5220 D m
Conductivity	11	N/A	2025/05/14	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	11	N/A	2025/05/14	CAM SOP-00446	SM 24 5310 B m
Dissolved Metals by ICPMS	10	N/A	2025/05/14	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2025/05/16	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	11	N/A	2025/05/15	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	10	N/A	2025/05/11	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Nitrate & Nitrite as Nitrogen in Water (2)	1	N/A	2025/05/12	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	10	2025/05/10	2025/05/14	CAM SOP-00413	SM 24th - 4500H+ B
pH (3)	1	2025/05/12	2025/05/14	CAM SOP-00413	SM 24th - 4500H+ B
Sulphate by Automated Turbidimetry	1	N/A	2025/05/14	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	9	N/A	2025/05/15	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	1	N/A	2025/05/16	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	11	2025/05/14	2025/05/15	CAM SOP-00428	SM 24 2540C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or

Your P.O. #: 250253-05
Your Project #: 250253-05
Site Location: HICKEY ROAD
Your C.O.C. #: 1041555-02-01, 1041555-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/16
Report #: R8540313
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C552864

Received: 2025/05/09, 11:12

implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(3) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Deepthi Shaji, Project Manager
Email: Deepthi.Shaji@bureauveritas.com
Phone# (905)817-5700 Ext:7065843

==========

This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C552864
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQSK43			AQSK43			AQSK44		
Sampling Date		2025/05/07 14:20			2025/05/07 14:20			2025/05/07 14:35		
COC Number		1041555-01-01			1041555-01-01			1041555-01-01		
	UNITS	HR1-03	RDL	QC Batch	HR1-03 Lab-Dup	RDL	QC Batch	HR2-03R	RDL	QC Batch
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9928749				13	0.050	9928722
Total Chemical Oxygen Demand (COD)	mg/L	37	4.0	9928418				150	4.0	9928143
Conductivity	umho/cm	120	2.0	9927212				930	2.0	9926462
Total Dissolved Solids	mg/L	105	10	9928953				555	10	9928953
Dissolved Organic Carbon	mg/L	1.8	0.4	9928550	1.9	0.4	9928550	51	0.4	9928550
pH	pH	7.14		9927213				6.58		9926463
Dissolved Sulphate (SO4)	mg/L	9.8	1.0	9927194				19	1.0	9926393
Alkalinity (Total as CaCO3)	mg/L	52	1.0	9927209				360	1.0	9926461
Dissolved Chloride (Cl-)	mg/L	ND	1.0	9927184				54	1.0	9926392
Nitrate (N)	mg/L	ND	0.10	9927092				ND	0.10	9926353

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas ID		AQSK45			AQSK45			AQSK46		
Sampling Date		2025/05/07 14:10			2025/05/07 14:10			2025/05/07 15:30		
COC Number		1041555-01-01			1041555-01-01			1041555-01-01		
	UNITS	HR3-03	RDL	QC Batch	HR3-03 Lab-Dup	RDL	QC Batch	HR4-10	RDL	QC Batch
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9928722				17	0.050	9928722
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	9928418				76	4.0	9928418
Conductivity	umho/cm	270	2.0	9926462				590	2.0	9926462
Total Dissolved Solids	mg/L	195	10	9928953				330	10	9928953
Dissolved Organic Carbon	mg/L	1.9	0.4	9928550				23	0.4	9928550
pH	pH	7.29		9926463				6.94		9926463
Dissolved Sulphate (SO4)	mg/L	8.3	1.0	9926393	8.1	1.0	9926393	9.8	1.0	9930562
Alkalinity (Total as CaCO3)	mg/L	70	1.0	9926461				240	1.0	9929998
Dissolved Chloride (Cl-)	mg/L	28	1.0	9926392	27	1.0	9926392	19	1.0	9930559
Nitrate (N)	mg/L	1.26	0.10	9926353				ND	0.10	9926353

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552864
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQSK46			AQSK47	AQSK48	AQSK49		
Sampling Date		2025/05/07 15:30			2025/05/07 15:20	2025/05/07 15:00	2025/05/07 16:10		
COC Number		1041555-01-01			1041555-01-01	1041555-01-01	1041555-01-01		
	UNITS	HR4-10 Lab-Dup	RDL	QC Batch	HR5-10	HR6-19	HR7-19	RDL	QC Batch
Inorganics									
Total Ammonia-N	mg/L				4.0	2.7	16	0.050	9928722
Total Chemical Oxygen Demand (COD)	mg/L				30	9.3	48	4.0	9928418
Conductivity	umho/cm				650	560	830	2.0	9926462
Total Dissolved Solids	mg/L				360	375	490	10	9928953
Dissolved Organic Carbon	mg/L				6.7	4.2	17	0.4	9928550
pH	pH				7.26	7.34	6.91		9926463
Dissolved Sulphate (SO4)	mg/L	9.7	1.0	9930562	34	28	73	1.0	9926393
Alkalinity (Total as CaCO3)	mg/L	250	1.0	9929998	220	260	310	1.0	9926461
Dissolved Chloride (Cl-)	mg/L	19	1.0	9930559	44	1.8	20	1.0	9926392
Nitrate (N)	mg/L				0.29	ND	0.57	0.10	9926353

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas ID		AQSK50		AQSK51	AQSK52	AQSK53		
Sampling Date		2025/05/07 15:40		2025/05/07 16:00	2025/05/07 15:50	2025/05/07		
COC Number		1041555-01-01		1041555-01-01	1041555-01-01	1041555-02-01		
	UNITS	HR8-19	QC Batch	HR9-21	HR10-21	HR-QAQC-GW1	RDL	QC Batch
Inorganics								
Total Ammonia-N	mg/L	ND	9928722	ND	ND	3.9	0.050	9928722
Total Chemical Oxygen Demand (COD)	mg/L	5.9	9928418	ND	ND	29	4.0	9928143
Conductivity	umho/cm	260	9926462	28	62	650	2.0	9926462
Total Dissolved Solids	mg/L	185	9928953	20	70	365	10	9928953
Dissolved Organic Carbon	mg/L	4.6	9928550	1.4	1.0	7.0	0.4	9928550
pH	pH	7.10	9926463	6.81	6.93	7.21		9926463
Dissolved Sulphate (SO4)	mg/L	8.5	9926393	4.0	3.2	34	1.0	9926393
Alkalinity (Total as CaCO3)	mg/L	110	9926461	9.0	20	220	1.0	9926461
Dissolved Chloride (Cl-)	mg/L	11	9926392	ND	3.5	44	1.0	9926392
Nitrate (N)	mg/L	0.17	9926353	0.13	0.81	0.28	0.10	9926353

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552864
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQSK43	AQSK44	AQSK45		AQSK46	AQSK46		
Sampling Date		2025/05/07 14:20	2025/05/07 14:35	2025/05/07 14:10		2025/05/07 15:30	2025/05/07 15:30		
COC Number		1041555-01-01	1041555-01-01	1041555-01-01		1041555-01-01	1041555-01-01		
	UNITS	HR1-03	HR2-03R	HR3-03	QC Batch	HR4-10	HR4-10 Lab-Dup	RDL	QC Batch
Metals									
Dissolved Aluminum (Al)	ug/L	14	170	11	9926343	52	51	4.9	9930636
Dissolved Barium (Ba)	ug/L	27	350	72	9926343	610	600	2.0	9930636
Dissolved Beryllium (Be)	ug/L	ND	ND	ND	9926343	ND	ND	0.40	9930636
Dissolved Boron (B)	ug/L	ND	150	22	9926343	300	300	10	9930636
Dissolved Cadmium (Cd)	ug/L	ND	ND	ND	9926343	ND	ND	0.090	9930636
Dissolved Calcium (Ca)	ug/L	15000	83000	34000	9926343	56000	56000	200	9930636
Dissolved Chromium (Cr)	ug/L	ND	ND	ND	9926343	ND	ND	5.0	9930636
Dissolved Cobalt (Co)	ug/L	ND	56	5.7	9926343	73	70	0.50	9930636
Dissolved Copper (Cu)	ug/L	ND	1.0	1.6	9926343	1.7	1.8	0.90	9930636
Dissolved Iron (Fe)	ug/L	ND	79000	ND	9926343	61000	60000	100	9930636
Dissolved Lead (Pb)	ug/L	ND	ND	ND	9926343	ND	ND	0.50	9930636
Dissolved Magnesium (Mg)	ug/L	2500	13000	1700	9926343	9500	9700	50	9930636
Dissolved Manganese (Mn)	ug/L	2.8	7000	19	9926343	3400	3300	2.0	9930636
Dissolved Molybdenum (Mo)	ug/L	0.79	ND	ND	9926343	ND	ND	0.50	9930636
Dissolved Nickel (Ni)	ug/L	ND	8.8	1.3	9926343	17	16	1.0	9930636
Dissolved Potassium (K)	ug/L	710	33000	1300	9926343	27000	28000	200	9930636
Dissolved Silicon (Si)	ug/L	3400	3800	2600	9926343	9900	10000	50	9930636
Dissolved Silver (Ag)	ug/L	ND	ND	ND	9926343	ND	ND	0.090	9930636
Dissolved Sodium (Na)	ug/L	1400	45000	11000	9926343	16000	17000	100	9930636
Dissolved Strontium (Sr)	ug/L	74	420	93	9926343	280	280	1.0	9930636
Dissolved Thallium (Tl)	ug/L	ND	ND	ND	9926343	ND	ND	0.050	9930636
Dissolved Titanium (Ti)	ug/L	ND	5.4	ND	9926343	ND	ND	5.0	9930636
Dissolved Vanadium (V)	ug/L	ND	7.7	ND	9926343	3.5	3.6	0.50	9930636
Dissolved Zinc (Zn)	ug/L	ND	6.6	ND	9926343	ND	ND	5.0	9930636

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552864
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQSK47	AQSK48	AQSK49	AQSK50	AQSK51		
Sampling Date		2025/05/07 15:20	2025/05/07 15:00	2025/05/07 16:10	2025/05/07 15:40	2025/05/07 16:00		
COC Number		1041555-01-01	1041555-01-01	1041555-01-01	1041555-01-01	1041555-01-01		
	UNITS	HR5-10	HR6-19	HR7-19	HR8-19	HR9-21	RDL	QC Batch
Metals								
Dissolved Aluminum (Al)	ug/L	12	12	39	7.7	12	4.9	9926343
Dissolved Barium (Ba)	ug/L	140	49	470	58	6.5	2.0	9926343
Dissolved Beryllium (Be)	ug/L	ND	ND	ND	ND	ND	0.40	9926343
Dissolved Boron (B)	ug/L	180	81	700	79	ND	10	9926343
Dissolved Cadmium (Cd)	ug/L	ND	ND	ND	ND	ND	0.090	9926343
Dissolved Calcium (Ca)	ug/L	56000	97000	91000	39000	2400	200	9926343
Dissolved Chromium (Cr)	ug/L	ND	ND	ND	ND	ND	5.0	9926343
Dissolved Cobalt (Co)	ug/L	12	0.87	27	ND	ND	0.50	9926343
Dissolved Copper (Cu)	ug/L	2.9	ND	4.9	2.5	ND	0.90	9926343
Dissolved Iron (Fe)	ug/L	10000	17000	24000	ND	ND	100	9926343
Dissolved Lead (Pb)	ug/L	ND	ND	ND	ND	ND	0.50	9926343
Dissolved Magnesium (Mg)	ug/L	5500	3300	9500	4000	370	50	9926343
Dissolved Manganese (Mn)	ug/L	950	280	1900	2.6	3.4	2.0	9926343
Dissolved Molybdenum (Mo)	ug/L	ND	ND	0.54	ND	ND	0.50	9926343
Dissolved Nickel (Ni)	ug/L	3.3	1.4	8.0	1.0	ND	1.0	9926343
Dissolved Potassium (K)	ug/L	9000	3300	19000	1700	640	200	9926343
Dissolved Silicon (Si)	ug/L	4700	3000	6400	5400	3700	50	9926343
Dissolved Silver (Ag)	ug/L	ND	ND	ND	ND	ND	0.090	9926343
Dissolved Sodium (Na)	ug/L	16000	4400	24000	7800	1100	100	9926343
Dissolved Strontium (Sr)	ug/L	320	340	430	250	27	1.0	9926343
Dissolved Thallium (Tl)	ug/L	0.11	ND	0.11	ND	ND	0.050	9926343
Dissolved Titanium (Ti)	ug/L	ND	ND	ND	ND	ND	5.0	9926343
Dissolved Vanadium (V)	ug/L	0.72	ND	1.5	ND	ND	0.50	9926343
Dissolved Zinc (Zn)	ug/L	ND	ND	ND	ND	ND	5.0	9926343

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552864
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQSK52	AQSK53		
Sampling Date		2025/05/07 15:50	2025/05/07		
COC Number		1041555-01-01	1041555-02-01		
	UNITS	HR10-21	HR-QAQC-GW1	RDL	QC Batch
Metals					
Dissolved Aluminum (Al)	ug/L	6.9	11	4.9	9926343
Dissolved Barium (Ba)	ug/L	5.2	140	2.0	9926343
Dissolved Beryllium (Be)	ug/L	ND	ND	0.40	9926343
Dissolved Boron (B)	ug/L	ND	180	10	9926343
Dissolved Cadmium (Cd)	ug/L	ND	ND	0.090	9926343
Dissolved Calcium (Ca)	ug/L	5400	56000	200	9926343
Dissolved Chromium (Cr)	ug/L	ND	ND	5.0	9926343
Dissolved Cobalt (Co)	ug/L	ND	12	0.50	9926343
Dissolved Copper (Cu)	ug/L	ND	2.8	0.90	9926343
Dissolved Iron (Fe)	ug/L	ND	9900	100	9926343
Dissolved Lead (Pb)	ug/L	ND	ND	0.50	9926343
Dissolved Magnesium (Mg)	ug/L	1000	5400	50	9926343
Dissolved Manganese (Mn)	ug/L	ND	940	2.0	9926343
Dissolved Molybdenum (Mo)	ug/L	ND	ND	0.50	9926343
Dissolved Nickel (Ni)	ug/L	ND	3.3	1.0	9926343
Dissolved Potassium (K)	ug/L	1000	8800	200	9926343
Dissolved Silicon (Si)	ug/L	3800	4700	50	9926343
Dissolved Silver (Ag)	ug/L	ND	ND	0.090	9926343
Dissolved Sodium (Na)	ug/L	2500	16000	100	9926343
Dissolved Strontium (Sr)	ug/L	56	310	1.0	9926343
Dissolved Thallium (Tl)	ug/L	ND	0.13	0.050	9926343
Dissolved Titanium (Ti)	ug/L	ND	ND	5.0	9926343
Dissolved Vanadium (V)	ug/L	ND	0.73	0.50	9926343
Dissolved Zinc (Zn)	ug/L	ND	ND	5.0	9926343

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

TEST SUMMARY

Bureau Veritas ID: AQSK43
Sample ID: HR1-03
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9927209	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9927184	N/A	2025/05/14	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9928418	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9927212	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9926343	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928749	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9927092	N/A	2025/05/12	Chandra Nandlal
pH	AT	9927213	2025/05/12	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9927194	N/A	2025/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas ID: AQSK43 Dup
Sample ID: HR1-03
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan

Bureau Veritas ID: AQSK44
Sample ID: HR2-03R
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9926461	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan
Chemical Oxygen Demand	SPEC	9928143	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926462	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9926343	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928722	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926353	N/A	2025/05/11	Helen He
pH	AT	9926463	2025/05/10	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas ID: AQSK45
Sample ID: HR3-03
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9926461	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552864
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AQSK45
Sample ID: HR3-03
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	9928418	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926462	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9926343	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928722	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926353	N/A	2025/05/11	Helen He
pH	AT	9926463	2025/05/10	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas ID: AQSK45 Dup
Sample ID: HR3-03
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan

Bureau Veritas ID: AQSK46
Sample ID: HR4-10
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9929998	N/A	2025/05/16	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9930559	N/A	2025/05/16	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9928418	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926462	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9930636	N/A	2025/05/16	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9928722	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926353	N/A	2025/05/11	Helen He
pH	AT	9926463	2025/05/10	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9930562	N/A	2025/05/16	Alina Dobreanu
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas ID: AQSK46 Dup
Sample ID: HR4-10
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9929998	N/A	2025/05/16	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9930559	N/A	2025/05/16	Alina Dobreanu
Dissolved Metals by ICPMS	ICP/MS	9930636	N/A	2025/05/16	Thuy Linh Nguyen

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

TEST SUMMARY

Bureau Veritas ID: AQSK46 Dup
Sample ID: HR4-10
Matrix: Water
Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphate by Automated Turbidimetry	SKAL	9930562	N/A	2025/05/16	Alina Dobreanu

Bureau Veritas ID: AQSK47
Sample ID: HR5-10
Matrix: Water
Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9926461	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan
Chemical Oxygen Demand	SPEC	9928418	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926462	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9926343	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928722	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926353	N/A	2025/05/11	Helen He
pH	AT	9926463	2025/05/10	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas ID: AQSK48
Sample ID: HR6-19
Matrix: Water
Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9926461	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan
Chemical Oxygen Demand	SPEC	9928418	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926462	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9926343	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928722	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926353	N/A	2025/05/11	Helen He
pH	AT	9926463	2025/05/10	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas ID: AQSK49
Sample ID: HR7-19
Matrix: Water
Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9926461	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552864
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AQSK49
Sample ID: HR7-19
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	9928418	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926462	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9926343	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928722	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926353	N/A	2025/05/11	Helen He
pH	AT	9926463	2025/05/10	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas ID: AQSK50
Sample ID: HR8-19
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9926461	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan
Chemical Oxygen Demand	SPEC	9928418	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926462	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9926343	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928722	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926353	N/A	2025/05/11	Helen He
pH	AT	9926463	2025/05/10	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas ID: AQSK51
Sample ID: HR9-21
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9926461	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan
Chemical Oxygen Demand	SPEC	9928143	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926462	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9926343	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928722	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926353	N/A	2025/05/11	Helen He
pH	AT	9926463	2025/05/10	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552864
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AQSK52
Sample ID: HR10-21
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9926461	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan
Chemical Oxygen Demand	SPEC	9928143	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926462	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9926343	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928722	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926353	N/A	2025/05/11	Helen He
pH	AT	9926463	2025/05/10	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas ID: AQSK53
Sample ID: HR-QAQC-GW1
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9926461	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan
Chemical Oxygen Demand	SPEC	9928143	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926462	N/A	2025/05/14	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9928550	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9926343	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928722	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926353	N/A	2025/05/11	Helen He
pH	AT	9926463	2025/05/10	2025/05/14	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan
Total Dissolved Solids	BAL	9928953	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552864
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: BM

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.0°C
Package 2	6.0°C

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9926343	Dissolved Aluminum (Al)	2025/05/14	91	80 - 120	93	80 - 120	ND, RDL=4.9	ug/L	1.9	20
9926343	Dissolved Barium (Ba)	2025/05/14	96	80 - 120	96	80 - 120	ND, RDL=2.0	ug/L	1.4	20
9926343	Dissolved Beryllium (Be)	2025/05/14	98	80 - 120	99	80 - 120	ND, RDL=0.40	ug/L	NC	20
9926343	Dissolved Boron (B)	2025/05/14	92	80 - 120	93	80 - 120	ND, RDL=10	ug/L	2.1	20
9926343	Dissolved Cadmium (Cd)	2025/05/14	95	80 - 120	94	80 - 120	ND, RDL=0.090	ug/L	NC	20
9926343	Dissolved Calcium (Ca)	2025/05/14	88	80 - 120	93	80 - 120	ND, RDL=200	ug/L	0.33	20
9926343	Dissolved Chromium (Cr)	2025/05/14	92	80 - 120	91	80 - 120	ND, RDL=5.0	ug/L	NC	20
9926343	Dissolved Cobalt (Co)	2025/05/14	96	80 - 120	95	80 - 120	ND, RDL=0.50	ug/L	NC	20
9926343	Dissolved Copper (Cu)	2025/05/14	95	80 - 120	92	80 - 120	ND, RDL=0.90	ug/L	0.68	20
9926343	Dissolved Iron (Fe)	2025/05/14	96	80 - 120	95	80 - 120	ND, RDL=100	ug/L	NC	20
9926343	Dissolved Lead (Pb)	2025/05/14	96	80 - 120	95	80 - 120	ND, RDL=0.50	ug/L	NC	20
9926343	Dissolved Magnesium (Mg)	2025/05/14	94	80 - 120	94	80 - 120	ND, RDL=50	ug/L	1.3	20
9926343	Dissolved Manganese (Mn)	2025/05/14	95	80 - 120	94	80 - 120	ND, RDL=2.0	ug/L	2.6	20
9926343	Dissolved Molybdenum (Mo)	2025/05/14	95	80 - 120	93	80 - 120	ND, RDL=0.50	ug/L	NC	20
9926343	Dissolved Nickel (Ni)	2025/05/14	94	80 - 120	93	80 - 120	ND, RDL=1.0	ug/L	NC	20
9926343	Dissolved Potassium (K)	2025/05/14	88	80 - 120	88	80 - 120	ND, RDL=200	ug/L	1.2	20
9926343	Dissolved Silicon (Si)	2025/05/14	88	80 - 120	90	80 - 120	ND, RDL=50	ug/L	0.51	20
9926343	Dissolved Silver (Ag)	2025/05/14	94	80 - 120	93	80 - 120	ND, RDL=0.090	ug/L	NC	20
9926343	Dissolved Sodium (Na)	2025/05/14	92	80 - 120	93	80 - 120	ND, RDL=100	ug/L	1.4	20
9926343	Dissolved Strontium (Sr)	2025/05/14	96	80 - 120	96	80 - 120	ND, RDL=1.0	ug/L	2.1	20
9926343	Dissolved Thallium (Tl)	2025/05/14	99	80 - 120	99	80 - 120	ND, RDL=0.050	ug/L	NC	20
9926343	Dissolved Titanium (Ti)	2025/05/14	94	80 - 120	93	80 - 120	ND, RDL=5.0	ug/L	NC	20
9926343	Dissolved Vanadium (V)	2025/05/14	95	80 - 120	94	80 - 120	ND, RDL=0.50	ug/L	NC	20
9926343	Dissolved Zinc (Zn)	2025/05/14	96	80 - 120	94	80 - 120	ND, RDL=5.0	ug/L	NC	20
9926353	Nitrate (N)	2025/05/11	105	80 - 120	93	80 - 120	ND, RDL=0.10	mg/L	0.60	20
9926392	Dissolved Chloride (Cl-)	2025/05/15	NC	80 - 120	100	80 - 120	ND, RDL=1.0	mg/L	0.74	20
9926393	Dissolved Sulphate (SO4)	2025/05/15	88	75 - 125	100	80 - 120	ND, RDL=1.0	mg/L	1.6	20
9926461	Alkalinity (Total as CaCO3)	2025/05/14			96	85 - 115	ND, RDL=1.0	mg/L	4.2	20
9926462	Conductivity	2025/05/14			101	85 - 115	ND, RDL=2.0	umho/cm	1.7	10
9926463	pH	2025/05/14			102	98 - 103			0.86	N/A

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9927092	Nitrate (N)	2025/05/12	94	80 - 120	96	80 - 120	ND, RDL=0.10	mg/L	0.55	20
9927184	Dissolved Chloride (Cl-)	2025/05/14	NC	80 - 120	97	80 - 120	ND, RDL=1.0	mg/L	0.58	20
9927194	Dissolved Sulphate (SO4)	2025/05/14	NC	75 - 125	95	80 - 120	ND, RDL=1.0	mg/L	0.86	20
9927209	Alkalinity (Total as CaCO3)	2025/05/13			96	85 - 115	ND, RDL=1.0	mg/L	0.75	20
9927212	Conductivity	2025/05/13			101	85 - 115	ND, RDL=2.0	umho/cm	0.17	10
9927213	pH	2025/05/13			102	98 - 103			1.1	N/A
9928143	Total Chemical Oxygen Demand (COD)	2025/05/14	106	80 - 120	101	80 - 120	ND, RDL=4.0	mg/L	NC	20
9928418	Total Chemical Oxygen Demand (COD)	2025/05/14	109	80 - 120	97	80 - 120	ND, RDL=4.0	mg/L	NC	20
9928550	Dissolved Organic Carbon	2025/05/14	92	80 - 120	95	80 - 120	ND, RDL=0.4	mg/L	1.7	20
9928722	Total Ammonia-N	2025/05/15	80	75 - 125	96	80 - 120	ND, RDL=0.050	mg/L	0.30	20
9928749	Total Ammonia-N	2025/05/15	90	75 - 125	95	80 - 120	ND, RDL=0.050	mg/L	0.61	20
9928953	Total Dissolved Solids	2025/05/15			97	80 - 120	ND, RDL=10	mg/L	1.2	20
9929998	Alkalinity (Total as CaCO3)	2025/05/16			95	85 - 115	ND, RDL=1.0	mg/L	NC	20
9930559	Dissolved Chloride (Cl-)	2025/05/16	84	80 - 120	98	80 - 120	ND, RDL=1.0	mg/L	0.016	20
9930562	Dissolved Sulphate (SO4)	2025/05/16	85	75 - 125	95	80 - 120	ND, RDL=1.0	mg/L	0.37	20
9930636	Dissolved Aluminum (Al)	2025/05/16	101	80 - 120	105	80 - 120	ND, RDL=4.9	ug/L	1.2	20
9930636	Dissolved Barium (Ba)	2025/05/16	NC	80 - 120	98	80 - 120	ND, RDL=2.0	ug/L	0.87	20
9930636	Dissolved Beryllium (Be)	2025/05/16	103	80 - 120	101	80 - 120	ND, RDL=0.40	ug/L	NC	20
9930636	Dissolved Boron (B)	2025/05/16	96	80 - 120	92	80 - 120	ND, RDL=10	ug/L	1.9	20
9930636	Dissolved Cadmium (Cd)	2025/05/16	98	80 - 120	96	80 - 120	ND, RDL=0.090	ug/L	NC	20
9930636	Dissolved Calcium (Ca)	2025/05/16	NC	80 - 120	103	80 - 120	ND, RDL=200	ug/L	1.5	20
9930636	Dissolved Chromium (Cr)	2025/05/16	98	80 - 120	97	80 - 120	ND, RDL=5.0	ug/L	NC	20
9930636	Dissolved Cobalt (Co)	2025/05/16	102	80 - 120	101	80 - 120	ND, RDL=0.50	ug/L	3.8	20
9930636	Dissolved Copper (Cu)	2025/05/16	99	80 - 120	97	80 - 120	ND, RDL=0.90	ug/L	4.0	20
9930636	Dissolved Iron (Fe)	2025/05/16	NC	80 - 120	100	80 - 120	ND, RDL=100	ug/L	1.5	20
9930636	Dissolved Lead (Pb)	2025/05/16	96	80 - 120	94	80 - 120	ND, RDL=0.50	ug/L	NC	20
9930636	Dissolved Magnesium (Mg)	2025/05/16	101	80 - 120	100	80 - 120	ND, RDL=50	ug/L	2.1	20
9930636	Dissolved Manganese (Mn)	2025/05/16	NC	80 - 120	99	80 - 120	ND, RDL=2.0	ug/L	1.1	20
9930636	Dissolved Molybdenum (Mo)	2025/05/16	98	80 - 120	97	80 - 120	ND, RDL=0.50	ug/L	NC	20
9930636	Dissolved Nickel (Ni)	2025/05/16	99	80 - 120	99	80 - 120	ND, RDL=1.0	ug/L	2.7	20

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9930636	Dissolved Potassium (K)	2025/05/16	NC	80 - 120	103	80 - 120	ND, RDL=200	ug/L	2.6	20
9930636	Dissolved Silicon (Si)	2025/05/16	98	80 - 120	103	80 - 120	ND, RDL=50	ug/L	0.89	20
9930636	Dissolved Silver (Ag)	2025/05/16	59 (1)	80 - 120	89	80 - 120	ND, RDL=0.090	ug/L	NC	20
9930636	Dissolved Sodium (Na)	2025/05/16	104	80 - 120	105	80 - 120	ND, RDL=100	ug/L	5.7	20
9930636	Dissolved Strontium (Sr)	2025/05/16	98	80 - 120	96	80 - 120	ND, RDL=1.0	ug/L	0.015	20
9930636	Dissolved Thallium (Tl)	2025/05/16	99	80 - 120	100	80 - 120	ND, RDL=0.050	ug/L	NC	20
9930636	Dissolved Titanium (Ti)	2025/05/16	98	80 - 120	98	80 - 120	ND, RDL=5.0	ug/L	NC	20
9930636	Dissolved Vanadium (V)	2025/05/16	102	80 - 120	101	80 - 120	ND, RDL=0.50	ug/L	2.2	20
9930636	Dissolved Zinc (Zn)	2025/05/16	98	80 - 120	97	80 - 120	ND, RDL=5.0	ug/L	NC	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Matrix Spike exceeds acceptance limits, probable matrix interference

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552864
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: BM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Louise Harding, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

C552864
2025/05/09 11:12

Bureau Veritas
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

NONT-2025-05-1796

Bottle Order #: 1041555

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#1192 BluMetric Environmental Inc	Company Name:	#5638 BluMetric Environmental Inc	Quotation #:	C45782
Attention:	Accounts Payable	Attention:	S'rana Scholes	P.O. #:	250253-05
Address:	1682 Woodward Drive Ottawa ON K2C 3R8	Address:	The Tower - The Woolen Mill 4 Cataraqui St Kingston ON K7K 1Z7	Project:	250253-05
Tel:	(613) 839-3053 Fax: (613) 839-5376	Tel:	(613) 531-2725 Fax:	Project Name:	
Email:	ap@blumetric.ca	Email:	sscholes@blumetric.ca, cbandler@blumetric.ca, edms	Site #:	Hickey Road
				Sampled By:	BM/NW

COC #: C#1041555-01-01

Project Manager: Deepthi Shaji

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558. ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO ☐ Reg 406 Table ___
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: [X]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): (Metals / Hg / Cr VI)	Groundwater - ODWS									# of Bottles	Comments
1		HR1-03	25/05/07	14:20	GW	✓	✓									6	
2		HR2-03R	25/05/07	14:35	GW	✓	✓									6	
3		HR3-03	25/05/07	14:10	GW	✓	✓									6	
4		HR4-10	25/05/07	15:30	GW	✓	✓									6	
5		HR5-10	25/05/07	15:20	GW	✓	✓									6	
6		HR6-19	25/05/07	15:00	GW	✓	✓									6	
7		HR7-19	25/05/07	16:10	GW	✓	✓									6	
8		HR8-19	25/05/07	15:40	GW	✓	✓									6	
9		HR9-21	25/05/07	16:00	GW	✓	✓									6	
10		HR10-21	25/05/07	15:50	GW	✓	✓									6	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Brad M Callin Brad M Callin	2025/05/08	8:00	[signature]	2025/05/09	11:12	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei		Custody Seal	Yes	No
	6/6/6	6/6/6	Present		
			Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client
GW
ICE

Bureau Veritas Canada (2019) Inc.

C552864
2025/05/09 11:12

Bureau Veritas
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#1192 BluMetric Environmental Inc	Company Name:	#5638 BluMetric Environmental Inc	Quotation #:	C45782	Bureau Veritas Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	S'rana Scholes	P.O. #:	250253-05		1041555
Address:	1682 Woodward Drive Ottawa ON K2C 3R8	Address:	The Tower - The Woolen Mill 4 Cataraqui St Kingston ON K7K 1Z7	Project:	250253-05	COC #:	Project Manager:
Tel:	(613) 839-3053 Fax: (613) 839-5376	Tel:	(613) 531-2725 Fax:	Project Name:		C#1041555-02-01	Deepthi Shaji
Email:	ap@blumetric.ca	Email:	sscholes@blumetric.ca, cbandler@blumetric.ca, edms	Site #:	Hickey Road		
				Sampled By:	BM/NW		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558. ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☐ Reg 406 Table ___ ☐ Other ___	

Include Criteria on Certificate of Analysis (Y/N)? ___

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI (DC)	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): Groundwater - ODWS	# of Bottles	Comments
1		HR-QAQC-GW1	25/05/07		GW	✓	✓	6	
2									
3									
4									
5									
6									
7									
8									
9									
10									

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
Brad M'Call Brad M'Call	2025/05/08	8:00	SCF YRGF						Present		
									Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Appendix D

D-3 Surface Water Laboratory Reports

Your P.O. #: 250253-05
Your Project #: 250253-05
Site Location: HICKEY ROAD
Your C.O.C. #: 1041556-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/16
Report #: R8539953
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C552994
Received: 2025/05/09, 11:12

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	3	N/A	2025/05/13	CAM SOP-00447	EPA 6020B m
Dissolved Aluminum (0.2 u, clay free)	2	N/A	2025/05/14	CAM SOP-00447	EPA 6020B m
Alkalinity	5	N/A	2025/05/13	CAM SOP-00448	SM 24 2320 B m
Biochemical Oxygen Demand (BOD)	5	2025/05/11	2025/05/16	CAM SOP-00427	SM 24 5210B m
Chloride by Automated Colourimetry	4	N/A	2025/05/14	CAM SOP-00463	SM 24 4500-Cl E m
Chloride by Automated Colourimetry	1	N/A	2025/05/15	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	5	N/A	2025/05/14	CAM SOP-00416	SM 24 5220 D m
Conductivity	5	N/A	2025/05/13	CAM SOP-00414	SM 24 2510 m
Hardness (calculated as CaCO3)	3	N/A	2025/05/13	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	2	N/A	2025/05/14	CAM SOP 00102/00408/00447	SM 2340 B
Total Metals Analysis by ICPMS	5	2025/05/14	2025/05/15	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	5	N/A	2025/05/15	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	5	N/A	2025/05/12	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (2)	5	2025/05/10	2025/05/13	CAM SOP-00413	SM 24th - 4500H+ B
Field Measured pH (3)	5	N/A	2025/05/13		Field pH Meter
Sulphate by Automated Turbidimetry	4	N/A	2025/05/14	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	1	N/A	2025/05/15	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	5	2025/05/14	2025/05/15	CAM SOP-00428	SM 24 2540C m
Field Temperature (3)	5	N/A	2025/05/13		Field Thermometer
Total Kjeldahl Nitrogen in Water	5	2025/05/13	2025/05/14	CAM SOP-00938	SM 4500-N B m
Total Phosphorus (Colourimetric)	4	2025/05/13	2025/05/14	CAM SOP-00407	SM 24 4500-P I
Total Phosphorus (Colourimetric)	1	2025/05/13	2025/05/15	CAM SOP-00407	SM 24 4500-P I
Total Suspended Solids	5	2025/05/14	2025/05/15	CAM SOP-00428	SM 24 2540D m
Un-ionized Ammonia (4)	5	2025/05/09	2025/05/15	Auto Calc.	PWQO

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

Your P.O. #: 250253-05
Your Project #: 250253-05
Site Location: HICKEY ROAD
Your C.O.C. #: 1041556-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/16
Report #: R8539953
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C552994

Received: 2025/05/09, 11:12

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

(3) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(4) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Your P.O. #: 250253-05
Your Project #: 250253-05
Site Location: HICKEY ROAD
Your C.O.C. #: 1041556-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/16
Report #: R8539953
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C552994
Received: 2025/05/09, 11:12

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Deepthi Shaji, Project Manager
Email: Deepthi.Shaji@bureauveritas.com
Phone# (905)817-5700 Ext:7065843

==========

This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQSQ23		AQSQ24			AQSQ24		
Sampling Date		2025/05/07 17:00		2025/05/07 16:45			2025/05/07 16:45		
COC Number		1041556-01-01		1041556-01-01			1041556-01-01		
	UNITS	HR-SW1	QC Batch	HR-SW2	RDL	QC Batch	HR-SW2 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Hardness (CaCO3)	mg/L	41	9926151	27	1.0	9926151			
Total Un-ionized Ammonia	mg/L	ND	9925845	ND	0.00061	9925845			
Field Measurements									
Field Temperature	Celsius	9.9	ONSITE	12.0	N/A	ONSITE			
Field Measured pH	pH	7.20	ONSITE	6.73		ONSITE			
Inorganics									
Total Ammonia-N	mg/L	ND	9928677	ND	0.050	9928677			
Total BOD	mg/L	ND	9926515	ND	2	9926515			
Total Chemical Oxygen Demand (COD)	mg/L	ND	9928069	7.3	4.0	9928069	8.0	4.0	9928069
Conductivity	umho/cm	91	9926412	60	2.0	9926412			
Total Dissolved Solids	mg/L	100	9928978	45	10	9928989			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.12	9927967	0.19	0.10	9927967			
pH	pH	7.52	9926413	7.17		9926413			
Total Phosphorus	mg/L	ND	9927965	ND	0.020	9927965			
Total Suspended Solids	mg/L	ND	9928944	ND	10	9928944			
Dissolved Sulphate (SO4)	mg/L	5.4	9926396	4.1	1.0	9926396	4.9	1.0	9926396
Alkalinity (Total as CaCO3)	mg/L	49	9926408	24	1.0	9926408			
Dissolved Chloride (Cl-)	mg/L	ND	9926395	ND	1.0	9926395	ND	1.0	9926395
Nitrite (N)	mg/L	ND	9926357	ND	0.010	9926357			
Nitrate (N)	mg/L	0.32	9926357	ND	0.10	9926357			
Nitrate + Nitrite (N)	mg/L	0.32	9926357	ND	0.10	9926357			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQSQ25		AQSQ26			AQSQ26		
Sampling Date		2025/05/07 16:35		2025/05/07 17:10			2025/05/07 17:10		
COC Number		1041556-01-01		1041556-01-01			1041556-01-01		
	UNITS	HR-SW3	QC Batch	HR-SW4	RDL	QC Batch	HR-SW4 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Hardness (CaCO3)	mg/L	23	9926151	12	1.0	9926151			
Total Un-ionized Ammonia	mg/L	ND	9925845	ND	0.00061	9925845			
Field Measurements									
Field Temperature	Celsius	12.1	ONSITE	6.9	N/A	ONSITE			
Field Measured pH	pH	6.79	ONSITE	6.24		ONSITE			
Inorganics									
Total Ammonia-N	mg/L	ND	9928677	ND	0.050	9928677			
Total BOD	mg/L	ND	9926515	ND	2	9926515			
Total Chemical Oxygen Demand (COD)	mg/L	11	9928069	5.2	4.0	9928069			
Conductivity	umho/cm	54	9926412	34	2.0	9926412	32	2.0	9926412
Total Dissolved Solids	mg/L	80	9928978	35	10	9928989			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.22	9927967	0.16	0.10	9927967			
pH	pH	6.98	9926413	6.66		9926413	6.67		9926413
Total Phosphorus	mg/L	ND	9927965	ND	0.020	9927965			
Total Suspended Solids	mg/L	ND	9928944	10	10	9928944			
Dissolved Sulphate (SO4)	mg/L	4.0	9926393	4.3	1.0	9926396			
Alkalinity (Total as CaCO3)	mg/L	17	9926408	8.2	1.0	9926408	7.9	1.0	9926408
Dissolved Chloride (Cl-)	mg/L	ND	9926392	ND	1.0	9926395			
Nitrite (N)	mg/L	ND	9926357	ND	0.010	9926357			
Nitrate (N)	mg/L	ND	9926357	ND	0.10	9926357			
Nitrate + Nitrite (N)	mg/L	ND	9926357	ND	0.10	9926357			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQSQ27			AQSQ27		
Sampling Date		2025/05/07 16:45			2025/05/07 16:45		
COC Number		1041556-01-01			1041556-01-01		
	UNITS	HR-QAQC-SW1	RDL	QC Batch	HR-QAQC-SW1 Lab-Dup	RDL	QC Batch
Calculated Parameters							
Hardness (CaCO3)	mg/L	26	1.0	9926151			
Total Un-ionized Ammonia	mg/L	ND	0.00061	9925845			
Field Measurements							
Field Temperature	Celsius	12.0	N/A	ONSITE			
Field Measured pH	pH	6.73		ONSITE			
Inorganics							
Total Ammonia-N	mg/L	ND	0.050	9928677			
Total BOD	mg/L	ND	2	9926515	ND	2	9926515
Total Chemical Oxygen Demand (COD)	mg/L	6.6	4.0	9928069			
Conductivity	umho/cm	60	2.0	9926412			
Total Dissolved Solids	mg/L	35	10	9928978			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.21	0.10	9927967			
pH	pH	7.22		9926413			
Total Phosphorus	mg/L	ND	0.020	9927965			
Total Suspended Solids	mg/L	ND	10	9928944			
Dissolved Sulphate (SO4)	mg/L	4.3	1.0	9926396			
Alkalinity (Total as CaCO3)	mg/L	24	1.0	9926408			
Dissolved Chloride (Cl-)	mg/L	ND	1.0	9926395			
Nitrite (N)	mg/L	ND	0.010	9926357			
Nitrate (N)	mg/L	ND	0.10	9926357			
Nitrate + Nitrite (N)	mg/L	ND	0.10	9926357			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQSQ23		AQSQ24		AQSQ25		
Sampling Date		2025/05/07 17:00		2025/05/07 16:45		2025/05/07 16:35		
COC Number		1041556-01-01		1041556-01-01		1041556-01-01		
	UNITS	HR-SW1	QC Batch	HR-SW2	QC Batch	HR-SW3	RDL	QC Batch
Metals								
Dissolved (0.2u) Aluminum (Al)	ug/L	22	9927110	50	9927911	72	5	9927110
Total Barium (Ba)	ug/L	13	9928972	13	9928972	12	2.0	9928972
Total Boron (B)	ug/L	ND	9928972	ND	9928972	ND	10	9928972
Total Calcium (Ca)	ug/L	15000	9928972	8700	9928972	7600	200	9928972
Total Cobalt (Co)	ug/L	ND	9928972	ND	9928972	ND	0.50	9928972
Total Copper (Cu)	ug/L	1.7	9928972	1.4	9928972	1.3	0.90	9928972
Total Iron (Fe)	ug/L	ND	9928972	ND	9928972	ND	100	9928972
Total Lead (Pb)	ug/L	ND	9928972	ND	9928972	ND	0.50	9928972
Total Magnesium (Mg)	ug/L	1300	9928972	1000	9928972	910	50	9928972
Total Manganese (Mn)	ug/L	2.0	9928972	2.1	9928972	3.4	2.0	9928972
Total Potassium (K)	ug/L	740	9928972	720	9928972	560	200	9928972
Total Sodium (Na)	ug/L	930	9928972	970	9928972	1100	100	9928972
Total Zinc (Zn)	ug/L	ND	9928972	ND	9928972	ND	5.0	9928972

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQSQ25			AQSQ26		AQSQ27		
Sampling Date		2025/05/07 16:35			2025/05/07 17:10		2025/05/07 16:45		
COC Number		1041556-01-01			1041556-01-01		1041556-01-01		
	UNITS	HR-SW3 Lab-Dup	RDL	QC Batch	HR-SW4	QC Batch	HR-QAQC-SW1	RDL	QC Batch
Metals									
Dissolved (0.2u) Aluminum (Al)	ug/L	70	5	9927110	79	9927911	53	5	9927110
Total Barium (Ba)	ug/L				12	9928972	13	2.0	9928972
Total Boron (B)	ug/L				ND	9928972	ND	10	9928972
Total Calcium (Ca)	ug/L				3200	9928972	8800	200	9928972
Total Cobalt (Co)	ug/L				ND	9928972	ND	0.50	9928972
Total Copper (Cu)	ug/L				2.1	9928972	1.4	0.90	9928972
Total Iron (Fe)	ug/L				290	9928972	ND	100	9928972
Total Lead (Pb)	ug/L				ND	9928972	ND	0.50	9928972
Total Magnesium (Mg)	ug/L				1000	9928972	1000	50	9928972
Total Manganese (Mn)	ug/L				15	9928972	ND	2.0	9928972
Total Potassium (K)	ug/L				910	9928972	680	200	9928972
Total Sodium (Na)	ug/L				1100	9928972	950	100	9928972
Total Zinc (Zn)	ug/L				ND	9928972	ND	5.0	9928972

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

TEST SUMMARY

Bureau Veritas ID: AQSQ23
Sample ID: HR-SW1
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9927110	N/A	2025/05/13	Nan Raykha
Alkalinity	AT	9926408	N/A	2025/05/13	Gurparteek KAUR
Biochemical Oxygen Demand (BOD)	DO	9926515	2025/05/11	2025/05/16	Frank Zhang
Chloride by Automated Colourimetry	SKAL	9926395	N/A	2025/05/14	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9928069	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926412	N/A	2025/05/13	Gurparteek KAUR
Hardness (calculated as CaCO3)		9926151	N/A	2025/05/13	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9928972	2025/05/14	2025/05/15	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928677	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926357	N/A	2025/05/12	Chandra Nandlal
pH	AT	9926413	2025/05/10	2025/05/13	Gurparteek KAUR
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Deepthi Shaji
Sulphate by Automated Turbidimetry	SKAL	9926396	N/A	2025/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	9928978	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Deepthi Shaji
Total Kjeldahl Nitrogen in Water	SKAL	9927967	2025/05/13	2025/05/14	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9927965	2025/05/13	2025/05/14	Vidhi Khatri
Total Suspended Solids	BAL	9928944	2025/05/14	2025/05/15	Tina Teng
Un-ionized Ammonia	CALC/NH3	9925845	2025/05/15	2025/05/15	Automated Statchk

Bureau Veritas ID: AQSQ24
Sample ID: HR-SW2
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9927911	N/A	2025/05/14	Azita Fazaeli
Alkalinity	AT	9926408	N/A	2025/05/13	Gurparteek KAUR
Biochemical Oxygen Demand (BOD)	DO	9926515	2025/05/11	2025/05/16	Frank Zhang
Chloride by Automated Colourimetry	SKAL	9926395	N/A	2025/05/14	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9928069	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926412	N/A	2025/05/13	Gurparteek KAUR
Hardness (calculated as CaCO3)		9926151	N/A	2025/05/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9928972	2025/05/14	2025/05/15	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928677	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926357	N/A	2025/05/12	Chandra Nandlal
pH	AT	9926413	2025/05/10	2025/05/13	Gurparteek KAUR
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Deepthi Shaji
Sulphate by Automated Turbidimetry	SKAL	9926396	N/A	2025/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	9928989	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Deepthi Shaji
Total Kjeldahl Nitrogen in Water	SKAL	9927967	2025/05/13	2025/05/14	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9927965	2025/05/13	2025/05/15	Vidhi Khatri
Total Suspended Solids	BAL	9928944	2025/05/14	2025/05/15	Tina Teng

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

TEST SUMMARY

Bureau Veritas ID: AQSQ24
Sample ID: HR-SW2
Matrix: Water
Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Un-ionized Ammonia	CALC/NH3	9925845	2025/05/15	2025/05/15	Automated Statchk

Bureau Veritas ID: AQSQ24 Dup
Sample ID: HR-SW2
Matrix: Water
Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	SKAL	9926395	N/A	2025/05/14	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9928069	N/A	2025/05/14	Kruti Jitesh Patel
Sulphate by Automated Turbidimetry	SKAL	9926396	N/A	2025/05/14	Alina Dobreanu

Bureau Veritas ID: AQSQ25
Sample ID: HR-SW3
Matrix: Water
Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9927110	N/A	2025/05/13	Nan Raykha
Alkalinity	AT	9926408	N/A	2025/05/13	Gurparteek KAUR
Biochemical Oxygen Demand (BOD)	DO	9926515	2025/05/11	2025/05/16	Frank Zhang
Chloride by Automated Colourimetry	SKAL	9926392	N/A	2025/05/15	Massarat Jan
Chemical Oxygen Demand	SPEC	9928069	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926412	N/A	2025/05/13	Gurparteek KAUR
Hardness (calculated as CaCO3)		9926151	N/A	2025/05/13	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9928972	2025/05/14	2025/05/15	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928677	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926357	N/A	2025/05/12	Chandra Nandlal
pH	AT	9926413	2025/05/10	2025/05/13	Gurparteek KAUR
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Deepthi Shaji
Sulphate by Automated Turbidimetry	SKAL	9926393	N/A	2025/05/15	Massarat Jan
Total Dissolved Solids	BAL	9928978	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Deepthi Shaji
Total Kjeldahl Nitrogen in Water	SKAL	9927967	2025/05/13	2025/05/14	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9927965	2025/05/13	2025/05/14	Vidhi Khatri
Total Suspended Solids	BAL	9928944	2025/05/14	2025/05/15	Tina Teng
Un-ionized Ammonia	CALC/NH3	9925845	2025/05/15	2025/05/15	Automated Statchk

Bureau Veritas ID: AQSQ25 Dup
Sample ID: HR-SW3
Matrix: Water
Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9927110	N/A	2025/05/13	Nan Raykha

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

TEST SUMMARY

Bureau Veritas ID: AQSQ26
Sample ID: HR-SW4
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9927911	N/A	2025/05/14	Azita Fazaeli
Alkalinity	AT	9926408	N/A	2025/05/13	Gurparteek KAUR
Biochemical Oxygen Demand (BOD)	DO	9926515	2025/05/11	2025/05/16	Frank Zhang
Chloride by Automated Colourimetry	SKAL	9926395	N/A	2025/05/14	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9928069	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926412	N/A	2025/05/13	Gurparteek KAUR
Hardness (calculated as CaCO3)		9926151	N/A	2025/05/14	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9928972	2025/05/14	2025/05/15	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928677	N/A	2025/05/15	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9926357	N/A	2025/05/12	Chandra Nandlal
pH	AT	9926413	2025/05/10	2025/05/13	Gurparteek KAUR
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Deepthi Shaji
Sulphate by Automated Turbidimetry	SKAL	9926396	N/A	2025/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	9928989	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Deepthi Shaji
Total Kjeldahl Nitrogen in Water	SKAL	9927967	2025/05/13	2025/05/14	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9927965	2025/05/13	2025/05/14	Vidhi Khatri
Total Suspended Solids	BAL	9928944	2025/05/14	2025/05/15	Tina Teng
Un-ionized Ammonia	CALC/NH3	9925845	2025/05/15	2025/05/15	Automated Statchk

Bureau Veritas ID: AQSQ26 Dup
Sample ID: HR-SW4
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9926408	N/A	2025/05/13	Gurparteek KAUR
Conductivity	AT	9926412	N/A	2025/05/13	Gurparteek KAUR
pH	AT	9926413	2025/05/10	2025/05/13	Gurparteek KAUR

Bureau Veritas ID: AQSQ27
Sample ID: HR-QAQC-SW1
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9927110	N/A	2025/05/13	Nan Raykha
Alkalinity	AT	9926408	N/A	2025/05/13	Gurparteek KAUR
Biochemical Oxygen Demand (BOD)	DO	9926515	2025/05/11	2025/05/16	Frank Zhang
Chloride by Automated Colourimetry	SKAL	9926395	N/A	2025/05/14	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9928069	N/A	2025/05/14	Kruti Jitesh Patel
Conductivity	AT	9926412	N/A	2025/05/13	Gurparteek KAUR
Hardness (calculated as CaCO3)		9926151	N/A	2025/05/13	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9928972	2025/05/14	2025/05/15	Nan Raykha
Total Ammonia-N	SKAL/NH4	9928677	N/A	2025/05/15	Massarat Jan

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

TEST SUMMARY

Bureau Veritas ID: AQSQ27
Sample ID: HR-QAQC-SW1
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate & Nitrite as Nitrogen in Water	LACH	9926357	N/A	2025/05/12	Chandra Nandlal
pH	AT	9926413	2025/05/10	2025/05/13	Gurparteek KAUR
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Deepthi Shaji
Sulphate by Automated Turbidimetry	SKAL	9926396	N/A	2025/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	9928978	2025/05/14	2025/05/15	Binuja Kodithuwakku Arachchilage
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Deepthi Shaji
Total Kjeldahl Nitrogen in Water	SKAL	9927967	2025/05/13	2025/05/14	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9927965	2025/05/13	2025/05/14	Vidhi Khatri
Total Suspended Solids	BAL	9928944	2025/05/14	2025/05/15	Tina Teng
Un-ionized Ammonia	CALC/NH3	9925845	2025/05/15	2025/05/15	Automated Statchk

Bureau Veritas ID: AQSQ27 Dup
Sample ID: HR-QAQC-SW1
Matrix: Water

Collected: 2025/05/07
Shipped:
Received: 2025/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Biochemical Oxygen Demand (BOD)	DO	9926515	2025/05/11	2025/05/16	Frank Zhang

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.3°C

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

QUALITY ASSURANCE REPORT

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9926357	Nitrate (N)	2025/05/12	92	80 - 120	95	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9926357	Nitrite (N)	2025/05/12	96	80 - 120	98	80 - 120	ND, RDL=0.010	mg/L	NC	20		
9926392	Dissolved Chloride (Cl-)	2025/05/15	NC	80 - 120	100	80 - 120	ND, RDL=1.0	mg/L	0.74	20		
9926393	Dissolved Sulphate (SO4)	2025/05/15	88	75 - 125	100	80 - 120	ND, RDL=1.0	mg/L	1.6	20		
9926395	Dissolved Chloride (Cl-)	2025/05/14	85	80 - 120	96	80 - 120	ND, RDL=1.0	mg/L	NC	20		
9926396	Dissolved Sulphate (SO4)	2025/05/14	88	75 - 125	95	80 - 120	ND, RDL=1.0	mg/L	16	20		
9926408	Alkalinity (Total as CaCO3)	2025/05/13			99	85 - 115	ND, RDL=1.0	mg/L	2.6	20		
9926412	Conductivity	2025/05/13			103	85 - 115	ND, RDL=2.0	umho/cm	3.9	10		
9926413	pH	2025/05/13			102	98 - 103			0.18	N/A		
9926515	Total BOD	2025/05/16					ND,RDL=2	mg/L	NC	30	103	80 - 120
9927110	Dissolved (0.2u) Aluminum (Al)	2025/05/13	98	80 - 120	100	80 - 120	ND,RDL=5	ug/L	3.1	20		
9927911	Dissolved (0.2u) Aluminum (Al)	2025/05/14	100	80 - 120	102	80 - 120	ND,RDL=5	ug/L	NC	20		
9927965	Total Phosphorus	2025/05/14	102	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	0.22	20	105	80 - 120
9927967	Total Kjeldahl Nitrogen (TKN)	2025/05/15	93	80 - 120	96	80 - 120	ND, RDL=0.10	mg/L	NC (1)	20	94	80 - 120
9928069	Total Chemical Oxygen Demand (COD)	2025/05/14	108	80 - 120	97	80 - 120	ND, RDL=4.0	mg/L	9.0	20		
9928677	Total Ammonia-N	2025/05/15	95	75 - 125	98	80 - 120	ND, RDL=0.050	mg/L	NC	20		
9928944	Total Suspended Solids	2025/05/15			102	80 - 120	ND, RDL=10	mg/L	NC	20		
9928972	Total Barium (Ba)	2025/05/15	100	80 - 120	98	80 - 120	ND, RDL=2.0	ug/L				
9928972	Total Boron (B)	2025/05/15	97	80 - 120	93	80 - 120	ND, RDL=10	ug/L	NC	20		
9928972	Total Calcium (Ca)	2025/05/15	100	80 - 120	100	80 - 120	ND, RDL=200	ug/L	2.9	20		
9928972	Total Cobalt (Co)	2025/05/15	104	80 - 120	101	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9928972	Total Copper (Cu)	2025/05/15	99	80 - 120	95	80 - 120	ND, RDL=0.90	ug/L	2.4	20		
9928972	Total Iron (Fe)	2025/05/15	101	80 - 120	100	80 - 120	ND, RDL=100	ug/L	1.8	20		
9928972	Total Lead (Pb)	2025/05/15	103	80 - 120	100	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9928972	Total Magnesium (Mg)	2025/05/15	101	80 - 120	97	80 - 120	ND, RDL=50	ug/L	3.3	20		
9928972	Total Manganese (Mn)	2025/05/15	99	80 - 120	98	80 - 120	ND, RDL=2.0	ug/L	4.1	20		
9928972	Total Potassium (K)	2025/05/15	94	80 - 120	93	80 - 120	ND, RDL=200	ug/L	2.2	20		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9928972	Total Sodium (Na)	2025/05/15	102	80 - 120	100	80 - 120	ND, RDL=100	ug/L	2.2	20		
9928972	Total Zinc (Zn)	2025/05/15	99	80 - 120	97	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9928978	Total Dissolved Solids	2025/05/15			102	80 - 120	ND, RDL=10	mg/L	5.7	20		
9928989	Total Dissolved Solids	2025/05/15			95	80 - 120	ND, RDL=10	mg/L	13	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Due to a high concentration of NOx, the sample required dilution. The detection limit was adjusted accordingly.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C552994
Report Date: 2025/05/16

BluMetric Environmental Inc
Client Project #: 250253-05
Site Location: HICKEY ROAD
Your P.O. #: 250253-05
Sampler Initials: NW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Deepthi Shaji, Project Manager

Louise Harding, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

C552994
2025/05/09 11:12

Bureau Veritas
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

NONT-2025-05-1797

Bottle Order #: 1041556

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#1192 BluMetric Environmental Inc	Company Name:	#5638 BluMetric Environmental Inc	Quotation #:	C45782
Attention:	Accounts Payable	Attention:	S'rana Scholes	P.O. #:	250253-05
Address:	1682 Woodward Drive	Address:	The Tower - The Woolen Mill 4 Cataraqui St	Project:	250253-05
	Ottawa ON K2C 3R8		Kingston ON K7K 1Z7	Project Name:	
Tel:	(613) 839-3053 Fax: (613) 839-5376	Tel:	(613) 531-2725 Fax:	Site #:	Hickey Road
Email:	ap@blumetric.ca	Email:	sscholes@blumetric.ca, cbandler@blumetric.ca, edms	Sampled By:	NW / BM

COC #: C#1041556-01-01

Project Manager: Deepthi Shaji

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO ☐ Reg 406 Table ___
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): Surface Water - PWQO	# of Bottles	Temp °C	Comments: pH
1		HR-SW1	25/05/07	17:00	SW	None	✓	6	9.9	7.20
2		HR-SW2	25/05/07	16:45	SW	None	✓	6	12.0	6.73
3		HR-SW3	25/05/07	16:35	SW	None	✓	6	12.1	6.79
4		HR-SW4	25/05/07	17:10	SW	None	✓	6	6.9	6.24
5		HR-QAQC-SW1	25/05/07	16:45	SW	None	✓	6	12.0	6.73
6										
7										
8										
9										
10										

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Nathan Wilson	25/05/08	08:00	[illegible]	25/05/09	11:12	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	C / S / 8	Present	✓	
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Appendix D

D-4 QAQC Calculations

2025 Groundwater Sampling Quality Assurance and Quality Control (Spring)

Sample Description		MDL	HR5-10	HR-QAQC-GW1 (HR5-10)	Relative Percent Difference
Date Sampled			07-May-25	07-May-25	
Parameter	**Unit**				
pH	pH Units	NA	7.26	7.21	NA
Alkalinity (as CaCO3)	mg/L	5	220	220	0%
Electrical Conductivity	uS/cm	2	650	650	0%
Total Dissolved Solids	mg/L	10	360	365	1%
Chloride	mg/L	0.1	44	44	0%
Nitrate as N	mg/L	0.05	0.29	0.28	4%
Sulphate	mg/L	0.1	34	34	0%
Ammonia as N	mg/L	0.18	4	3.9	3%
Chemical Oxygen Demand	mg/L	5	30	29	3%
Dissolved Organic Carbon	mg/L	0.5	6.7	7	4%
Dissolved Calcium	mg/L	0.05	56	56	0%
Dissolved Magnesium	mg/L	0.05	5.5	5.4	2%
Dissolved Potassium	mg/L	0.5	9	8.8	2%
Dissolved Sodium	mg/L	0.05	16	16	0%
Dissolved Aluminum	mg/L	0.004	0.012	0.011	NA
Dissolved Barium	mg/L	0.002	0.14	0.14	0%
Dissolved Beryllium	mg/L	0.001	<0.0004	<0.0004	NA
Dissolved Boron	mg/L	0.01	0.18	0.18	0%
Dissolved Cadmium	mg/L	0.0001	<0.00009	<0.00009	NA
Dissolved Chromium	mg/L	0.003	<0.005	<0.005	NA
Dissolved Cobalt	mg/L	0.0005	0.012	0.012	0%
Dissolved Copper	mg/L	0.002	0.0029	0.0028	NA
Dissolved Iron	mg/L	0.1	10	9.9	1%
Dissolved Lead	mg/L	0.001	<0.0005	<0.0005	NA
Dissolved Manganese	mg/L	0.002	0.95	0.94	1%
Dissolved Molybdenum	mg/L	0.002	<0.0005	<0.0005	NA
Dissolved Nickel	mg/L	0.001	0.0033	0.0033	NA
Dissolved Silicon	mg/L	0.05	4.7	4.7	0%
Dissolved Silver	mg/L	0.0001	<0.00009	<0.00009	NA
Dissolved Strontium	mg/L	0.005	0.32	0.31	3%
Dissolved Thallium	mg/L	0.0003	0.00011	0.00013	NA
Dissolved Titanium	mg/L	0.002	<0.005	<0.005	NA
Dissolved Vanadium	mg/L	0.002	0.00072	0.00073	NA
Dissolved Zinc	mg/L	0.005	<0.005	<0.005	NA

Yellow shading indicates RPD value is above the percentage for a high level of reproducibility:

10% for electrical conductivity

20% for metals and inorganics

30% for BTEX and PHC.

2025 Groundwater Sampling Quality Assurance and Quality Control
(Fall)

Sample Description		MDL	HR2-03R	HR-QAQC GW1 (HR2-03R)	Relative Percent Difference
Date Sampled			22-Oct-25	22-Oct-25	
Parameter	Unit				
pH	pH Units	NA	6.97	6.91	NA
Alkalinity (as CaCO3)	mg/L	5	170	180	6%
Electrical Conductivity	uS/cm	2	670	670	0%
Total Dissolved Solids	mg/L	10	300	375	22%
Chloride	mg/L	0.10	78	78	0%
Nitrate as N	mg/L	0.05	<0.1	<0.1	NA
Sulphate	mg/L	0.10	5.2	4.4	17%
Ammonia as N	mg/L	0.18	3.2	3.2	0%
Chemical Oxygen Demand	mg/L	5	27	24	12%
Dissolved Organic Carbon	mg/L	0.5	11	11	0%
Dissolved Calcium	mg/L	0.05	67	69	3%
Dissolved Magnesium	mg/L	0.05	6.4	6.7	5%
Dissolved Potassium	mg/L	0.50	15	15	0%
Dissolved Sodium	mg/L	0.05	28	29	4%
Dissolved Aluminum	mg/L	0.004	0.07	0.071	1%
Dissolved Barium	mg/L	0.002	0.15	0.15	0%
Dissolved Beryllium	mg/L	0.001	<0.0004	<0.0004	NA
Dissolved Boron	mg/L	0.010	0.08	0.078	3%
Dissolved Cadmium	mg/L	0.0001	<0.00009	<0.00009	NA
Dissolved Chromium	mg/L	0.003	<0.005	<0.005	NA
Dissolved Cobalt	mg/L	0.0005	0.0079	0.0078	1%
Dissolved Copper	mg/L	0.002	<0.0009	<0.0009	NA
Dissolved Iron	mg/L	0.10	34	34	0%
Dissolved Lead	mg/L	0.001	<0.0005	<0.0005	NA
Dissolved Manganese	mg/L	0.002	3.6	3.4	6%
Dissolved Molybdenum	mg/L	0.002	<0.0005	<0.0005	NA
Dissolved Nickel	mg/L	0.001	0.0013	0.0015	NA
Dissolved Silicon	mg/L	0.05	6.5	6.8	5%
Dissolved Silver	mg/L	0.0001	<0.00009	<0.00009	NA
Dissolved Strontium	mg/L	0.005	0.31	0.31	0%
Dissolved Thallium	mg/L	0.0003	<0.00005	<0.00005	NA
Dissolved Titanium	mg/L	0.002	<0.005	<0.005	NA
Dissolved Vanadium	mg/L	0.002	0.0053	0.0052	NA
Dissolved Zinc	mg/L	0.005	0.017	0.016	NA

Yellow shading indicates RPD value is above the percentage for a high level of reproducibility:

10% for electrical conductivity

20% for metals and inorganics

30% for BTEX and PHC.

2025 Surface Water Sampling Quality Assurance and Quality Control

(Spring)

Sample Description		MDL	HR-SW2	HR-QAQC-SW1 (HR-SW2)	Relative Percent Difference
Date Sampled			07-May-25	07-May-25	
Parameter	**Unit**				
pH	pH Units	0.01	7.17	7.22	1%
Alkalinity (as CaCO3)	mg/L	5	24	24	NA
Electrical Conductivity	uS/cm	2	60	60	0%
Hardness (as CaCO3) (Calculated)	mg/L	0.5	27	26	4%
Total Dissolved Solids	mg/L	10	45	35	NA
Total Suspended Solids	mg/L	10	<10	<10	NA
Chloride	mg/L	0.10	<1	<1	NA
Nitrate as N	mg/L	0.05	<0.1	<0.1	NA
Nitrite as N	mg/L	0.05	<0.01	<0.01	NA
Sulphate	mg/L	0.10	4.1	4.3	5%
Ammonia as N	mg/L	0.02	<0.05	<0.05	NA
Total Kjeldahl Nitrogen	mg/L	0.10	0.19	0.21	NA
Total Phosphorus	mg/L	0.02	<0.02	<0.02	NA
Chemical Oxygen Demand	mg/L	5	7.3	6.6	NA
Total Calcium	mg/L	0.32	8.7	8.8	1%
Total Magnesium	mg/L	0.34	1	1	NA
Total Potassium	mg/L	1.15	0.72	0.68	NA
Total Sodium	mg/L	0.45	0.97	0.95	NA
Aluminum-dissolved	mg/L	0.004	0.05	0.053	6%
Total Barium	mg/L	0.002	0.013	0.013	0%
Total Boron	mg/L	0.010	<0.01	<0.01	NA
Total Cobalt	mg/L	0.0005	<0.0005	<0.0005	NA
Total Copper	mg/L	0.002	0.0014	0.0014	NA
Total Iron	mg/L	0.010	<0.1	<0.1	NA
Total Lead	mg/L	0.001	<0.0005	<0.0005	NA
Total Manganese	mg/L	0.002	0.0021	<0.002	NA
Total Zinc	mg/L	0.020	<0.005	<0.005	NA

Yellow shading indicates RPD value is above the percentage for a high level of reproducibility:

10% for electrical conductivity

20% for metals and inorganics

30% for BTEX and PHC.

Appendix E

Historical Groundwater and Surface Water Chemistry

Appendix E

E-1 Historical Groundwater Chemistry

Appendix E-1 - Historic Groundwater Chemistry Hickey Road WDS

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2003-Sep-30	2006-May-10	2006-Nov-20	2007-May-03	2008-May-08	2008-Oct-09	2009-Jun-04	2009-Oct-21	2010-May-18	2010-Oct-19	2011-May-19	2012-Apr-16	2013-Apr-16	2014-May-12	2015-May-05	2016-Apr-27	2017-May-12	2017-Oct-24	2018-May-09
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	7	-	-	3	1	1	2	1	2	<1	31	2	1.52	1.3	1.06	0.94	2.28	0.68	0.84
Fluoride	mg/L	-	1.5	-	-	0.01	0.59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	1.83	<0.1	<0.1	<0.1	<0.1	0.23	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	<0.05	0.1	<0.05	0.08	<0.05	<0.05
Sulphate	mg/L	-	500	-	-	0.1	49	8	31	12	8	11	10	12	11	12	12	6	15.1	6.8	12.5	7.05	7.91	11.4	2.1
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	85	10	18	31	12	19	12	20	27	24	22	13.3	28.7	9.61	28.1	10.5	10.5	24.3	15.4
Magnesium (diss)	mg/L	-	-	-	-	0.05	9	1	2	2	<1	2	2	4	3	2	2	995	2.29	0.73	2.74	1.63	1.51	4.33	2.62
Potassium (diss)	mg/L	-	-	-	-	0.05	4	2	2	1	<1	1	1	1	<1	<1	<1	752	1.27	0.87	1.12	1.9	1.13	0.95	1.11
Sodium (diss)	mg/L	104.495	200	-	-	0.05	18	<2	<2	<2	<2	<2	2	<2	2	<2	<2	1.12	2.93	1.33	1.39	1.66	1.32	1.21	1.32
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	215	22	46	75	29	54	31	64	81	71	57	36	65	20	67	30	31	79	51
Ammonia as N	mg/L	-	-	-	-	0.02	-	-	-	0.06	0.03	<0.02	<0.02	0.02	0.03	<0.02	<0.02	0.02	0.14	0.02	<0.02	0.07	<0.02	<0.02	0.04
Chemical Oxygen Demand	mg/L	-	-	-	-	4	-	-	-	<5	16	25	15	34	25	30	18	61	8	<5	9	<5	<5	21	<5
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	-	-	-	5.7	5.8	9.3	7.7	14.6	8.6	11.9	5.2	6.3	2.2	5.6	3.1	2.7	1.8	14.1	2.1
Electrical Conductivity	uS/cm	-	-	-	-	1	481	64	123	171	78	135	90	153	190	166	133	103	168	64	168	74	86	155	107
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	237	29.1	53.2	85.6	32	55.7	38.2	66.4	79.8	68.2	63.2	4130.6	81.1	27	81.4	32.9	32.4	78.5	49.2
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.02	6.71	6.63	6.67	7.38	6.9	6.73	6.87	7.84	6.89	7.34	7.1	7.52	7.18	7.69	7.5	7.77	7.62	6.83
Total Dissolved Solids	mg/L	314	500	-	-	10	-	-	-	111	51	88	59	100	123	108	86	133	118	90	120	76	72	92	58
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.01	0.05	0.06	0.02	0.03	0.03	0.04	0.01	<0.01	0.02	0.01	0.02	0.02	0.02	0.01	0.03	0.01	0.01	0.01
Antimony (diss)	mg/L	-	0.006	-	0.02		0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.05	<0.01	0.01	0.04	0.02	0.02	0.03	0.04	0.04	0.03	0.02	0.02	0.04	0.02	0.04	0.02	0.02	0.04	0.03
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.03**
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.1	0.01	0.01	0.02	<0.01	0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	0.02	<0.01	0.01	<0.01	<0.01	0.01	<0.01
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	0	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.0001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	0	<0.001	0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0.01	<0.0002	0	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0	0	<0.0002	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	0	0	0	0	0	0	<0.001	0	<0.001	0	<0.001	0	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	0.03	<0.03	0.07	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	1.98	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0	<0.002	0	<0.002	<0.002	<0.002	<0.002
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0	<0.002	<0.002	<0.002	<0.002	<0.002	0	<0.002
Nickel (diss)	mg/L	-	-	0.025	-	0.001	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	7.4	3.9	5.2	4	4.3	5.4	3.6	4.9	4.4	4.9	4.1	3.21	4.56	4.17	3.82	4.51	4.96	4.29	3.99
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	0	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Strontium (diss)	mg/L	-	-	-	-	0.001	0.39	0.05	0.11	0.12	0.05	0.09	0.08	0.12	0.15	0.15	0.1	0.07	0.16	0.05	0.13	0.05	0.06	0.12	0.08
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	0	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Titanium (diss)	mg/L	-	-	-	-	0.002	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR1-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2019-May-08	2020-May-08	2021-Apr-22	2021-Oct-21	2022-May-02	2023-May-03	2024-Apr-16	2025-May-07	2003-Sep-30	2006-May-10	2006-Nov-20	2007-May-03	2007-Nov-22	2008-May-08	2008-Oct-09	2009-Jun-04	2009-Oct-21	2010-May-18	2010-Oct-19
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	0.77	1.06	0.97	31.3	0.58	4.17	<1	<1	6	-	-	4	3	5	3	19	9	11	8
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	<0.05	<0.05	0.06	1.06	<0.05	<0.05	<0.1	<0.1	0.21	5.24	5.12	4.54	0.42	4.58	3.15	5.43	4.97	8.46	4.65
Sulphate	mg/L	-	500	-	-	0.1	5.08	7.51	7.07	7.16	8.89	9.52	8	9.8	45	88	51	44	26	48	47	54	33	48	40
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	9.16	8.43	18.6	33.8	27.7	12.2	21	15	85	72	64	51	51	62	49	60	43	55	50
Magnesium (diss)	mg/L	-	-	-	-	0.05	1.31	1.31	2.05	4.22	1.99	0.87	3.1	2.5	6	11	6	5	4	7	4	6	4	5	4
Potassium (diss)	mg/L	-	-	-	-	0.05	0.93	0.61	0.78	1.36	0.9	0.69	0.92	0.71	4	21	18	14	5	11	17	15	10	8	9
Sodium (diss)	mg/L	104.495	200	-	-	0.05	1.15	1.18	1.39	2.01	1.09	1.26	1.6	1.4	6	10	7	6	3	9	4	8	3	11	7
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	35	26	58	71	73	38	65	52	215	161	135	108	138	128	107	111	99	113	104
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.03	<0.02	0.1	<0.02	<0.02	<0.05	<0.05	-	-	-	0.04	0.07	<0.02	<0.02	<0.02	0.02	<0.02	<0.02
Chemical Oxygen Demand	mg/L	-	-	-	-	4	<5	7	<5	12	<5	19	13	37	-	-	-	5	10	<5	20	15	17	18	8
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	2.6	1.7	3.1	1.9	2.6	2.7	2	1.8	-	-	-	9.6	10.9	6.8	8.8	6.5	5	5.5	5.6
Electrical Conductivity	uS/cm	-	-	-	-	1	68	79	124	245	165	84	130	120	481	547	437	350	322	406	353	442	340	434	355
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	28.3	26.4	54.9	101.8	77.4	-	-	-	237	225.1	184.5	147.9	143.8	183.6	138.8	174.5	123.8	157.9	141.3
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.57	6.68	7.06	**6.35**	6.86	7.16	6.96	7.14	6.86	6.86	6.71	**6.42**	6.88	7.12	6.6	6.57	6.71	7.61	**6.48**
Total Dissolved Solids	mg/L	314	500	-	-	10	72	60	150	178	114	84	45	105	-	-	-	228	209	264	229	287	221	282	231
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.02	0.02	0.023	0.04	0.007	0.018	0.0079	0.014	<0.01	0.1	0.02	0.04	0.02	0.04	0.03	0.04	0.03	0.03	0.03
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.02	0.02	0.023	0.065	0.039	0.017	0.038	0.027	0.05	0.24	0.13	0.14	0.06	0.19	0.17	0.22	0.13	0.16	0.12
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0004	<0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	<0.01	<0.01	<0.01	0.248	<0.01	<0.01	<0.01	<0.01	0.1	0.32	0.23	0.21	0.07	0.15	0.17	0.2	0.12	0.11	0.11
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.005	<0.005	<0.001	0	0	0	<0.001	0	<0.001	0	0	<0.001	0
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.01	0.01	0.01	0.01	0	0.01	0	0.01	0.01	0.01	0
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	0	<0.002	<0.002	<0.002	<0.002	<0.001	0.0013	<0.0009	0	0.01	0	0.01	0	0.01	0	0.01	0	0	0
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	<0.01	<0.01	0.035	<0.01	<0.01	0.034	<0.1	<0.1	0.03	<0.03	<0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0028	1.98	0.12	0.13	0.08	0.63	0.04	0.06	0.04	0.05	0.05	0.05
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	<0.0001	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.0011	0.00079	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel (diss)	mg/L	-	-	0.025	-	0.001	<0.003	<0.003	<0.003	<0.003	0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	4.07	2.78	3.47	4.95	3.61	4.61	4.6	3.4	7.4	3.6	5.7	4.1	7.6	3	5.3	3.7	5.7	3.6	5.4
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.0001	<0.0001	<0.0001	0.0001	0.0001	<0.0001	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.05	0.04	0.082	0.15	0.139	0.05	0.095	0.074	0.39	0.4	0.29	0.18	0.21	0.26	0.16	0.34	0.25	0.27	0.23
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.00005	<0.001	0	0	0	<0.0001	<0.0001	0	0	0	0	0
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	0.006	0.003	0.007	<0.002	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005	<0.001	0	0	0	0	0	<0.001	0	0	<0.001	<0.001
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Appendix E-1 - Historic Groundwater Chemistry Hickey Road WDS

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03	HR2-03R	HR2-03R	HR2-03R	HR2-03R	HR2-03R
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2011-May-19	2011-Nov-03	2012-Apr-16	2012-Oct-15	2013-Apr-16	2013-Oct-30	2014-May-12	2014-Oct-16	2016-Apr-27	2016-Oct-27	2017-May-12	2017-Oct-24	2018-May-09	2018-Oct-23	2019-May-08	2019-Oct-23	2020-May-08	2020-Oct-08	2021-Apr-22
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	32	5	12	9	9.39	5.52	52.9	8.56	74	4.48	52.3	50.4	61.4	3.18	70.7	6.15	59.1	14.7	54.7
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	6.79	1.81	3.7	1.4	4.96	1.48	8.22	5.09	9.75	1.04	6.36	2.62	8.56	0.75	2.16	0.1	<0.25	<0.05	<0.1
Sulphate	mg/L	-	500	-	-	0.1	43	21	34	57	40.2	33.1	47.3	36.3	84.2	35.8	56.1	18.4	5.4	22.3	35	23	35.4	23.7	26
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	64	54	40.4	51.3	65.7	70.2	74.9	52.4	94.1	67.2	62.9	55.1	61.5	45.2	76	39.9	73.1	44.6	72
Magnesium (diss)	mg/L	-	-	-	-	0.05	6	4	3.46	6.03	6.03	5.52	6.56	1.21	8.96	5.31	5.8	3.81	4.76	3.8	6.92	3.44	6.31	3.82	6.85
Potassium (diss)	mg/L	-	-	-	-	0.05	8	3	6.7	4.91	10.5	4.67	11.4	8.18	11.2	6.92	7.67	13.1	19.6	6.44	15.7	5.99	15.9	6.38	14.5
Sodium (diss)	mg/L	104.495	200	-	-	0.05	16	<2	14.8	3.15	8.09	3.45	15.7	9.91	39	5.92	30.2	18.2	31.9	5.94	42	6.81	33.3	9.95	45.6
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	122	129	120	178	138	147	113	100	164	164	129	131	138	113	245	130	226	140	243
Ammonia as N	mg/L	-	-	-	-	0.02	0.02	0.04	0.02	0.05	0.09	<0.02	0.02	0.08	0.1	0.08	<0.02	<0.02	0.08	<0.02	<0.02	0.06	0.08	0.04	0.21
Chemical Oxygen Demand	mg/L	-	-	-	-	4	28	20	21	98	8	12	10	10	31	23	14	14	<5	<5	15	<5	47	11	48
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	7.3	3.6	6.2	6.7	3.8	2.2	4.6	3.1	7.3	3	4.5	8	5.4	3.5	8.2	2.5	15.4	3.1	25.8
Electrical Conductivity	uS/cm	-	-	-	-	1	511	305	405	460	405	369	561	396	754	416	625	420	563	325	706	292	811	312	688
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	184.5	151.3	115.1	152.9	188.9	198	214	135.8	271.9	189.7	180.9	153.3	173.2	128.5	218.3	113.8	208.5	127.1	208
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.28	6.54	6.9	6.4	7.17	7.21	7.01	6.75	7.47	7.92	7.91	7.76	7.11	7.78	6.73	7.56	6.51	7.65	6.81
Total Dissolved Solids	mg/L	314	500	-	-	10	332	198	345	243	262	266	358	<0.002	436	246	312	254	328	192	410	178	360	170	354
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.04	<0.01	0.03	0.01	0.03	0.02	0.04	0.02	0.05	0.16	0.05	0.02	0.05	0.01	0.06	0.36	0.16	0.03	0.092
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	-	-	0.16	-	-	-	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.17	0.05	0.12	0.1	0.11	0.07	0.16	0.1	0.24	0.09	0.16	0.13	0.26	0.07	0.23	0.07	0.19	0.06	0.167
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.26	<0.001	0	<0.0005	<0.001	<0.01	<0.001
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.11	0.04	0.2	0.07	0.31	0.07	0.15	0.09	0.22	0.06	0.14	0.14	0.19	0.05	0.12	0.06	0.11	0.06	0.152
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	0	<0.0001	0	0	<0.0001	<0.0001	<0.0001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	0	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0.01	0	0	0	0	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0.01	0.04	0.01	0.0281
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	0.01	0	0	0	<0.003	<0.003	0	<0.003	0.01	<0.003	0.01	0	0	<0.003	0.01	0.01	0	0	<0.002
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	<0.03	<0.03	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	1.47	33.5	5.89	29.5
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.001	<0.001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	0.05	<0.01	0.03	0.12	0.05	0.03	0.06	0.04	0.11	0.19	0.03	0.03	0.04	0.05	0.16	0.71	2.14	0.49	1.36
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.005	<0.005	<0.0005	0	<0.002	<0.002	<0.002	<0.002	0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel (diss)	mg/L	-	-	0.025	-	0.001	<0.005	<0.005	0	<0.004	<0.003	<0.003	<0.003	<0.003	<0.003	0	<0.003	<0.003	<0.003	<0.003	<0.003	0	0.01	0	0.009
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	-	-	2.94	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	3.8	7.7	3.53	5.21	4.13	5.99	3.44	5.05	3.07	5.69	2.94	4.04	4.43	5.34	3.24	5.88	3.69	6.27	5.29
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.0001	<0.0001	<0.0001	0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.3	0.27	0.22	0.37	0.29	0.28	0.37	0.26	0.34	0.28	0.31	0.24	0.34	0.22	0.38	0.19	0.32	0.21	0.372
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	0	<0.0001	0	0	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.01	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.01	<0.002	<0.002	<0.002	<0.002	<0.002	0.03	0	<0.002	<0.002
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	0	0	0	<0.0005	<0.002	<0.002	<0.002	234	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0	<0.002	0.002
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	<0.01	<0.01	<0.005	<0.005	0.01	0.05	<0.005	<0.005	0.05	<0.005	0.01	0.01	0.01	0.01	0.02	0.01	0.01	<0.005	0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Appendix E-1 - Historic Groundwater Chemistry Hickey Road WDS

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	QC GW-S21 (HR	HR2-03R	HR2-03R	HR2-03R	HR2-03R	HR2-03R	HR2-03R	AQC-GW1 (HR2	HR2-03R	AQC-GW1 (HR2	HR2-03R	HR2-03R	AQC-GW1 (HR2	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03
Parameter	**Units**	**RUV-HR**	**ODWQS**	**PWQO-GENERAL**	**PWQO-INTERIM**	**Sample Date**	**2021-Apr-22**	**2021-Oct-21**	**2022-May-02**	**2022-Oct-20**	**2023-May-03**	**2023-Oct-17**	**2024-Apr-16**	**2024-Apr-16**	**2024-Oct-28**	**2024-Oct-28**	**2025-May-07**	**2025-Oct-22**	**2025-Oct-22**	**2003-Sep-30**	**2006-May-10**	**2006-Nov-20**	**2007-May-03**	**2007-Nov-22**	**2008-May-08**
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	54.2	38.3	86.7	15.6	89.7	35	69	74	64	64	54	78	78	7	-	-	6	2	7
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	0.47	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.83	2.97	<0.1	2.96	0.19	1.87
Sulphate	mg/L	-	500	-	-	0.1	26.3	10.9	26.9	24.8	26.8	7.3	45	45	3.6	3.4	19	5.2	4.4	49	20	33	35	17	27
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	72.7	90.9	93.8	57	99.6	57	97	98	82	81	83	67	69	35	47	15	40	18	43
Magnesium (diss)	mg/L	-	-	-	-	0.05	6.87	7.15	6.94	4.67	13.1	4.8	9.1	9.4	9.2	9.3	13	6.4	6.7	3	2	1	3	2	2
Potassium (diss)	mg/L	-	-	-	-	0.05	14.3	11.8	12.5	6.85	37.6	16	14	14	18	18	33	15	15	4	3	2	3	2	4
Sodium (diss)	mg/L	104.495	200	-	-	0.05	45.3	26.6	33.7	15.3	69.9	23	18	18	47	48	45	28	29	18	3	<2	4	<2	7
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	232	274	229	148	403	170	180	180	310	310	360	170	180	69	98	37	71	51	81
Ammonia as N	mg/L	-	-	-	-	0.02	0.26	0.33	0.18	0.32	5.3	1.8	0.62	0.64	3.6	3.5	13	3.2	3.2	-	-	-	0.03	<0.02	<0.02
Chemical Oxygen Demand	mg/L	-	-	-	-	4	51	35	43	11	168	26	38	39	81	77	150	27	24	-	-	-	<5	<5	5
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	24.9	15.1	14.9	4.5	62.5	7.8	7.1	7	18	19	51	11	11	-	-	-	5.6	3.8	3
Electrical Conductivity	uS/cm	-	-	-	-	1	682	679	762	400	1080	490	610	620	810	820	930	670	670	247	295	111	256	143	257
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	209.8	256.4	262.8	161.6	-	-	-	-	-	-	-	-	-	100	125.6	41.6	112.2	53.2	115.6
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.86	6.54	6.65	7.05	6.83	7.42	6.94	6.96	7.21	7.22	6.58	6.97	6.91	7.02	7.14	6.67	6.38	6.85	7.19
Total Dissolved Solids	mg/L	314	500	-	-	10	348	390	444	222	638	260	400	435	500	480	555	300	375	-	-	-	166	93	167
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.088	0.096	0.081	0.063	0.205	0.046	0.031	0.031	0.072	0.071	0.17	0.07	0.071	<0.01	0.03	<0.01	0.02	0.02	0.02
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.162	0.149	0.186	0.068	0.391	0.13	0.16	0.16	0.19	0.19	0.35	0.15	0.15	0.05	0.1	0.04	0.14	0.05	0.17
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.156	0.191	0.1	0.071	0.162	0.085	0.074	0.075	0.11	0.11	0.15	0.08	0.078	0.01	0.05	0.03	0.03	0.01	0.03
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	<0.003	0.005	<0.003	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	0	<0.001	<0.001	<0.001	<0.001
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0.0278	0.0135	0.0173	0.0042	0.0531	0.006	0.0061	0.0062	0.0052	0.0055	0.056	0.0079	0.0078	0	0	0	0	0	0
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	<0.002	<0.002	<0.002	<0.001	0.001	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009	0.001	<0.0009	<0.0009	0	0	0	0.01	0	0
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	29	30.1	13.9	8.58	46.3	17	24	24	32	32	79	34	34	0.01	<0.03	<0.03	<0.03	<0.03	<0.03
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	1.36	1.07	2.04	0.918	4.11	2.4	2.7	2.7	3.1	3.2	7	3.6	3.4	0.01	0.05	<0.01	0.02	<0.01	0.04
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel (diss)	mg/L	-	-	0.025	-	0.001	0.008	0.003	0.008	0.002	0.009	<0.001	0.003	0.0029	0.0027	0.0028	0.0088	0.0013	0.0015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.58	7.21	4.55	6.49	5.09	7.8	9	9	7.5	7.4	3.8	6.5	6.8	4.3	4	4.6	5.3	5.2	4.6
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.362	0.479	0.535	0.3	0.448	0.23	0.42	0.43	0.41	0.42	0.42	0.31	0.31	0.12	0.13	0.05	0.12	0.06	0.12
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (diss)	mg/L	-	-	-	-	0.002	0.006	<0.002	0.01	0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0054	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	0.004	0.004	0.002	<0.002	0.007	0.0034	0.0019	0.002	0.0049	0.005	0.0077	0.0053	0.0052	<0.001	0	<0.001	0	0	0
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0066	0.017	0.016	<0.01	<0.01	<0.01	0.01	0.01	<0.01

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2008-Oct-09	2009-Jun-04	2009-Oct-21	2010-May-18	2010-Oct-19	2011-May-19	2011-Nov-03	2012-Apr-16	2012-Oct-15	2013-Apr-16	2013-Oct-30	2014-May-12	2014-Oct-16	2015-May-05	2015-Oct-27	2016-Apr-27	2016-Oct-27	2017-May-12	2017-Oct-24
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	1	4	2	7	6	34	6	24	8	5.79	4.64	34	8.56	16.8	36.1	137	1.52	21.1	2.77
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	0.17	1	1.35	4.82	1.88	1.98	0.61	2.6	0.7	1.19	0.38	1.43	0.68	1.43	1.46	0.81	0.16	0.29	0.26
Sulphate	mg/L	-	500	-	-	0.1	21	25	13	27	20	10	14	11	12	15.5	10.1	10.5	16.9	15.1	14.7	4.08	10.5	16.5	17.6
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	18	39	21	37	33	47	26	30.4	10.3	29.1	14.4	30.1	16.8	23.1	28.7	40.9	6.6	24.8	19.4
Magnesium (diss)	mg/L	-	-	-	-	0.05	2	2	2	3	3	2	2	1.88	1.88	3.47	1.37	1.31	1.21	1.6	2.77	1.95	0.53	1.17	1.43
Potassium (diss)	mg/L	-	-	-	-	0.05	2	2	2	3	3	3	3	3.06	1.75	2.49	2.09	2.87	2.26	2.73	2.41	3.75	1.34	1.7	1.65
Sodium (diss)	mg/L	104.495	200	-	-	0.05	2	4	3	4	3	5	9	8.72	6.89	8.66	8.95	15.6	14.4	17.1	14.7	55.9	11.5	16.6	6.42
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	36	88	56	75	79	84	65	60	45	71	42	54	52	61	51	57	36	69	53
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.02	<0.01	0.19	<0.02	<0.02	0.1	<0.02	<0.02	0.04	<0.02	<0.02	<0.02
Chemical Oxygen Demand	mg/L	-	-	-	-	4	10	13	12	10	5	10	30	3.7	2.4	<5	5	<5	7	<5	<5	<5	<5	6	<5
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	3.1	3.3	2.9	3.5	3.4	2.4	2.9	17	25	1.6	1.6	2	2.3	3.5	2.8	2.3	2.3	2.2	2.6
Electrical Conductivity	uS/cm	-	-	-	-	1	128	250	159	270	231	320	171	278	151	198	122	259	180	219	260	553	102	262	138
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	53.2	105.6	60.7	104.7	94.8	125.6	73.2	83.7	33.5	87	41.6	80.6	46.9	64.3	83.1	110.2	18.7	66.7	54.3
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.91	7	6.9	7.74	6.92	7.2	6.41	6.5	6.4	7.61	7.08	7.14	6.65	6.96	7.13	7.49	7.28	7.74	7.43
Total Dissolved Solids	mg/L	314	500	-	-	10	83	163	103	176	150	208	111	250	89	128	94	158	106	128	162	322	56	128	94
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.01	0.01	<0.01	<0.01	0.01	0.01	0.23	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.04	0.09	0.06	0.14	0.07	0.15	0.05	0.18	0.04	0.04	0.03	0.14	0.07	0.14	0.06	0.3	0.02	0.11	0.06
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.06	0.05	0.03	0.04	0.04	0.02	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.24	0.04
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0	0	0	0	0	0	0	0	0	0	<0.001	0	0	0	0	0.01	<0.001	0	0
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	0	0	0	0	0	0	0	0	0	<0.003	0	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.37	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	<0.01	0.03	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.005	0	0	0.02	0.01	0.01	0	0.04	<0.002	0.02	0.01
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel (diss)	mg/L	-	-	0.025	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.06	-
Silicon (diss)	mg/L	-	-	-	-	0.05	3.7	3.1	4.7	4	4.7	4.1	4.2	3.91	3.2	5.32	4.11	3.52	3.82	4.86	4.26	2.95	3.5	3.06	3.34
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Strontium (diss)	mg/L	-	-	-	-	0.001	0.06	0.12	0.08	0.13	0.11	0.14	0.06	0.13	0.06	0.1	0.05	0.1	0.07	0.1	0.11	0.15	0.03	0.07	0.07
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.001	<0.001	0	<0.001	<0.001	<0.001	0	0	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	0.05	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR3-03	HR3-03	HR3-03	AQC GW-S19 (HI	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	QAQC-GW1 (HR3	HR3-03	HR3-03	HR3-03	HR3-03	HR3-03	HR4-10
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2018-May-09	2018-Oct-23	2019-May-08	2019-May-08	2019-Oct-23	2020-May-08	2020-Oct-08	2021-Apr-22	2021-Oct-21	2022-May-02	2022-Oct-20	2023-May-03	2023-May-03	2023-Oct-17	2024-Apr-16	2024-Oct-28	2025-May-07	2025-Oct-22	2010-May-18
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	49.2	0.92	43.3	43.3	1.26	32	1.38	18.3	14.5	18.2	5.75	29.3	29.6	3.9	<1	15	28	10	40
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	0.76	0.09	2.97	2.9	0.4	2.62	0.42	1.97	1.74	2.04	0.59	1.84	1.85	0.31	0.12	0.87	1.26	0.5	<0.1
Sulphate	mg/L	-	500	-	-	0.1	2.5	9.74	2.7	2.64	12.4	22.6	7.56	7.74	10.4	10	8.97	4.6	4.53	7.2	7.1	9.8	8.3	4.6	39
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	42.9	9.86	28.3	28.6	8.73	37	10.7	31	20.5	34.2	20.2	34.2	35.1	11	12	22	34	15	85
Magnesium (diss)	mg/L	-	-	-	-	0.05	2.74	0.7	1.26	1.24	0.64	2.31	0.8	2.06	1.29	2.01	1.55	1.23	1.2	0.82	1.1	1.8	1.7	1.3	7
Potassium (diss)	mg/L	-	-	-	-	0.05	1.94	1.43	1.65	1.66	1.23	1.44	1.23	1.52	1.64	1.61	<0.5	1.75	1.72	1.1	1.1	1.5	1.3	1.2	14
Sodium (diss)	mg/L	104.495	200	-	-	0.05	13	8.59	16.6	16.8	8	8.98	8.71	9.74	12.1	13.7	10	12.6	12.6	9.2	10	13	11	8.9	23
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	84	36	72	72	34	73	43	71	58	88	57	69	66	34	53	58	70	39	248
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	0.07	<0.02	0.03	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.051	3.49
Chemical Oxygen Demand	mg/L	-	-	-	-	4	<5	<5	<5	<5	<5	5	<5	<5	<5	<5	<5	<5	<5	<4	6.1	6.2	<4	<4	65
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	2.5	5.4	1.6	1.6	2.1	2.2	2.1	2	2.2	2.4	2	1.7	1.5	2.5	2.2	2.9	1.9	3	20.1
Electrical Conductivity	uS/cm	-	-	-	-	1	324	111	273	276	97	359	102	232	194	268	161	255	252	100	110	190	270	140	692
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	118.4	27.5	75.9	76.5	24.4	101.9	30	85.9	56.5	93.7	56.8	-	-	-	-	-	-	-	241.1
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.08	7.32	6.59	6.57	7.11	6.51	6.75	6.79	6.57	6.76	7.14	7.05	7.17	7.33	7.23	7.65	7.29	7.28	7.65
Total Dissolved Solids	mg/L	314	500	-	-	10	194	70	172	180	62	176	54	114	112	204	84	154	148	90	50	145	195	95	450
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.02	0.03	0.01	0.01	0.05	0.02	0.02	0.008	0.027	0.021	<0.004	0.013	0.02	0.0058	<0.0049	0.0062	0.011	<0.0049	0.02
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.16	0.03	0.11	0.11	0.03	0.11	0.03	0.101	0.096	0.098	0.027	0.067	0.067	0.023	0.031	0.065	0.072	0.029	0.32
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	0.16	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.001
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.02	0.02	0.02	0.02	0.03	0.01	0.02	0.02	0.049	0.012	0.023	0.013	0.011	0.024	0.011	0.024	0.022	0.018	0.28
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	0	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0	<0.001	0	0	0	0	<0.0005	0.0029	0.002	0.0037	0.0009	0.0046	0.0042	0.00071	0.0012	0.0041	0.0057	0.00099	0.08
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	<0.003	<0.003	0	0	0	0	0	0.002	0.003	0.002	0.003	0.001	0.001	0.0017	0.0018	0.0029	0.0016	0.0013	<0.001
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	61.4
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	0.02	0	0.02	0.02	0	0.02	<0.002	0.01	0.007	0.015	0.002	0.02	0.018	<0.002	<0.002	0.0042	0.019	<0.002	3.99
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005
Nickel (diss)	mg/L	-	-	0.025	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0013	0.0013	<0.001	0.02
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	4.01	3.59	2.83	2.54	3.37	2.44	3.78	3.75	4.57	3.37	3.88	3.44	3.47	4.1	4.7	4.3	2.6	3.6	10
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.13	0.04	0.09	0.09	0.04	0.11	0.04	0.088	0.076	0.094	0.068	0.093	0.087	0.032	0.04	0.077	0.093	0.048	0.47
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.006	<0.006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0001
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	<0.002	<0.002	0	<0.002	<0.002	0.013	<0.002	0.003	0.003	<0.002	0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	<0.005	0.01	<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	<0.005	<0.005	<0.01

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2010-Oct-19	2011-May-19	2011-Nov-03	2012-Apr-16	2012-Oct-15	2013-Apr-16	2013-Oct-30	2014-May-12	2014-Oct-16	2015-May-05	2015-Oct-27	2016-Apr-27	2016-Oct-27	2017-May-12	2017-Oct-24	2018-May-09	2018-Oct-23	2019-May-08	2019-Oct-23
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	56	119	117	34	125	94.2	194	37.2	214	55.1	76.5	72.8	127	44.8	122	4.46	54	11.3	83.5
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	163	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	0.27	0.7	<0.1	6.6	<0.1	0.44	<0.5	6.34	0.2	1.27	<0.25	<0.25	<0.25	<0.05	<0.25	<0.05	<0.25	<0.05	<0.25
Sulphate	mg/L	-	500	-	-	0.1	50	56	91	57	63	76.2	68.8	36.9	82.7	36.3	17.2	5.82	35.7	5.43	44.2	8.9	50.8	6.45	61.1
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	74	93	107	52.5	56.4	84	120	69.8	143	76.6	81.6	84.3	94	39.8	87.1	22.6	65	34.8	75.6
Magnesium (diss)	mg/L	-	-	-	-	0.05	9	9	14	5.26	10.6	13.5	18.8	7.57	18.7	12.9	13.7	9.27	15.8	4.3	21.1	2.77	14.5	5.39	17.3
Potassium (diss)	mg/L	-	-	-	-	0.05	16	18	25	18.5	25	33.9	54.3	27.5	48.5	56.8	51.5	27.9	48	22.7	68	18.6	53.2	24.6	67.5
Sodium (diss)	mg/L	104.495	200	-	-	0.05	42	58	63	52.5	87.1	85	204	36.5	209	71.7	60.6	59.6	103	44.9	188	10.3	49.3	17.2	128
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	228	231	288	237	301	292	479	221	703	392	349	345	464	239	790	154	328	349	571
Ammonia as N	mg/L	-	-	-	-	0.02	3.2	2.51	2.82	2.02	3.29	0.65	8.3	0.54	11.9	14	8.4	4.96	14.2	7.2	33.8	9.26	23.6	11.2	20
Chemical Oxygen Demand	mg/L	-	-	-	-	4	33	53	88	53	145	40	99	33	138	57	83	217	144	145	286	38	104	95	132
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	11.9	14	22	15.2	30	13.1	30.8	14	49.1	27.1	23.3	93.2	22.8	44.7	79.6	8.9	38.5	33	43.6
Electrical Conductivity	uS/cm	-	-	-	-	1	705	963	1080	752	1050	986	1620	674	2010	1020	968	859	1380	689	1660	317	1030	619	1350
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	221.8	269.3	324.8	152.8	184.5	265.3	377.1	205.5	434.1	244.4	260.2	248.7	299.8	117.1	304.4	67.8	222	109.1	260
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.92	7.16	6.69	6.7	6.5	7.49	7.2	7.17	6.83	7.27	7.29	7.22	7.17	7.33	7.82	7.27	7.62	6.5	7.48
Total Dissolved Solids	mg/L	314	500	-	-	10	458	626	702	540	564	572	1000	332	1130	568	496	522	774	358	976	142	572	300	802
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	<0.01	0.01	<0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.05	0.02	0.04	0.18	0.03	0.03	0.04	0.05
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.17	0.32	0.35	0.26	0.39	0.32	0.6	0.35	0.56	0.4	0.42	0.51	0.64	0.41	1.41	0.45	0.88	0.68	0.91
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.45**	<0.001	<0.0005	<0.0005
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.25	0.22	0.23	0.26	0.38	0.38	0.37	0.26	0.52	0.51	0.31	0.23	0.36	0.27	0.57	0.11	0.42	0.26	0.55
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.0001	0	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	0	0.01	0	<0.001	0	<0.003	0	<0.003	<0.003	0	0	<0.003	0.01	0	0	<0.003	<0.003	<0.003	<0.003
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0.03	0.04	0.03	0.02	0.02	0.02	0.03	0.01	0.03	0.02	0.04	0.1	0.17	0.16	0.15	0.08	0.1	0.09	0.08
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	0	0.01	0	0.02	0	0.03	0.01	0.01	0.06	0.05	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0	<0.001
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	4.42	7.51	9.83	0.11	3.05	0.77	5.59	0.07	0.11	0.53	8.8	112	124	163	151	50.6	106	115	60.5
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	2.91	2.75	3.55	2.03	2.42	3.23	3.54	1.49	3.38	2	2.63	5.52	4.61	6.02	6.91	2.24	3.03	3.33	2.63
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.005	<0.005	<0.005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0	<0.002	<0.002	<0.002	<0.002
Nickel (diss)	mg/L	-	-	0.025	-	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	**0.03**	<0.003	0.01	0.02	0.02
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	7.8	8.2	8	7.77	6.22	8.14	8.09	7.56	5.26	7.49	8.84	11.6	11.8	11.9	12.1	10.4	10.6	10.9	8.92
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.46	0.54	0.65	0.23	0.39	0.55	0.86	0.36	0.77	0.42	0.51	0.51	0.73	0.32	0.75	0.18	0.45	0.28	0.46
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	0	0	<0.0001	0	<0.0001	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.0003	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.01	<0.01	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0	0	<0.002	0	<0.002	<0.002	<0.002	0
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	0	0	0.01	0	0	<0.002	<0.002	<0.002	<0.002	<0.002	0	0.01	0.01	0.01	0.02	0	0.01	0.01	0.01
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	<0.01	<0.01	<0.01	<0.005	<0.005	0.02	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	0.01	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	AQC GW-S22 (HI	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR4-10	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2020-May-08	2020-Oct-08	2021-Apr-22	2021-Oct-21	2022-May-02	2022-May-02	2022-Oct-20	2023-May-03	2023-Oct-17	2024-Apr-16	2024-Oct-28	2025-May-07	2025-Oct-22	2010-May-18	2010-Oct-19	2011-May-19	2011-Nov-03	2012-Apr-16	2012-Oct-15
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	14.5	46	40.5	58.1	35	34.5	51.2	35.4	110	22	49	19	64	6	4	10	7	8	6
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	<0.25	<0.25	<0.25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.68	1.06	<0.1	1.2	0.3
Sulphate	mg/L	-	500	-	-	0.1	5.3	47	7.44	8.99	6.91	6.14	36.5	10.6	34	41	28	9.8	38	39	33	32	20	26	18
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	48.9	73	78.9	54.1	49.6	49.6	81.6	83.6	120	59	64	56	90	59	50	54	54	41.2	50.7
Magnesium (diss)	mg/L	-	-	-	-	0.05	8.6	14.5	13.4	9.98	8.25	8.15	14.3	12.3	21	9.8	12	9.5	20	5	4	5	4	4.52	3.97
Potassium (diss)	mg/L	-	-	-	-	0.05	37.1	45.5	46.3	31.5	24.6	24	29.7	41.9	58	25	50	27	57	10	11	8	11	9.15	9.91
Sodium (diss)	mg/L	104.495	200	-	-	0.05	20	45.9	47.4	58.8	29	28.9	78.2	54.8	150	51	60	16	110	11	6	7	4	7.04	4.03
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	364	373	424	395	325	323	357	477	660	290	420	240	600	175	146	157	158	139	152
Ammonia as N	mg/L	-	-	-	-	0.02	20.2	20.6	25.5	25.2	18.9	17.9	19.6	21.7	36	12	41	17	45	2.07	1	1.18	0.39	0.33	0.38
Chemical Oxygen Demand	mg/L	-	-	-	-	4	48	91	74	164	153	157	60	88	200	62	130	76	130	58	28	23	35	44	54
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	27.8	42.8	37.5	55.7	37.3	43.1	47.8	35.6	64	17	41	23	55	20.3	12.1	11.1	7.8	9.4	8.1
Electrical Conductivity	uS/cm	-	-	-	-	1	911	886	968	990	774	773	1040	954	1700	690	1100	590	1500	445	370	408	352	386	348
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	157.5	242	252.2	176.2	157.8	157.4	262.6	-	-	-	-	-	-	167.9	141.3	155.4	151.3	121.5	142.9
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.51	7.04	6.79	6.74	6.72	6.72	7.02	7.24	7.15	7.12	7.42	6.94	7.13	7.43	7	7.04	6.53	6.5	**6.3**
Total Dissolved Solids	mg/L	314	500	-	-	10	348	486	486	506	386	378	514	474	905	415	510	330	710	289	241	265	229	294	198
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.04	0.07	0.042	0.073	0.052	0.032	0.103	0.037	0.047	0.016	0.04	0.052	0.044	0.01	<0.01	<0.01	<0.01	0	0
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.78	0.77	0.618	0.709	0.553	0.621	0.691	0.528	0.98	0.25	0.89	0.61	0.8	0.19	0.18	0.15	0.12	0.16	0.1
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.28	0.43	0.421	0.45	0.232	0.226	0.336	0.4	0.44	0.26	0.5	0.3	0.53	0.14	0.12	0.1	0.11	0.17	0.14
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	<0.003	<0.003	<0.003	0.006	<0.003	<0.003	0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	0	0	<0.001	<0.001
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0.07	0.05	0.036	0.0968	0.0338	0.0375	0.0464	0.0246	0.065	0.037	0.037	0.073	0.059	0.05	0.02	0.02	0.01	0.01	0.01
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	0.0038	<0.0009	<0.0009	0.0017	<0.0009	<0.001	0	0	0	0	0
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	66	77.6	60.577	129.2	131	125	62.6	42.2	83	30	58	61	74	39.3	8.87	5.65	0.93	0.3	0.2
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	4.46	2.92	2.3	2.73	2.58	2.72	1.65	1.01	2.4	0.92	2.2	3.4	2.1	1.18	0.52	0.92	0.58	0.43	0.4
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.00091	0.0007	<0.0005	<0.0005	0.00079	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.0005
Nickel (diss)	mg/L	-	-	0.025	-	0.001	0.02	0.01	0.012	**0.038**	0.007	0.008	0.011	0.009	0.015	0.012	0.01	0.017	0.015	0.01	0.01	0.01	0.01	0.01	0.01
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	9.44	10.7	9.42	11.5	8.65	8.07	8.71	9.14	10	7.6	8.3	9.9	9.9	9.2	6.7	6.8	6.4	5.59	4.88
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.35	0.44	0.483	0.294	0.267	0.261	0.434	0.359	0.62	0.26	0.36	0.28	0.51	0.3	0.27	0.25	0.27	0.22	0.23
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	0	<0.0001
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	0	<0.002	0.002	0.003	0.003	<0.002	0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	0	0.01	0.005	0.008	0.007	0.006	0.007	0.006	0.0097	0.0034	0.005	0.0035	0.0086	<0.001	<0.001	0	0	0	0
Zinc (diss)	mg/L	2.50125	5	-	0.02	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	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Appendix E-1 - Historic Groundwater Chemistry Hickey Road WDS

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	QAQC GW-S20 (	HR5-10	AQC GW-F20 (HI	HR5-10
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2013-Apr-16	2013-Oct-30	2014-May-12	2014-Oct-16	2015-May-05	2015-Oct-27	2016-Apr-27	2016-Oct-27	2017-May-12	2017-Oct-24	2018-May-09	2018-Oct-23	2019-May-08	2019-Oct-23	2020-May-08	2020-May-08	2020-Oct-08	2020-Oct-08	2021-Apr-22
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	8.85	10.1	7.09	19.4	20.5	15	16	27.8	31.5	34.9	39.8	22.8	56.6	36.5	39.6	40.3	24.8	24.5	30.4
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	2.31	<0.5	2.57	0.23	2.77	0.05	1.61	<0.25	4.56	1.13	5.81	0.35	3.22	<0.25	0.32	0.37	<0.05	<0.05	0.22
Sulphate	mg/L	-	500	-	-	0.1	26	22.3	32.4	21.1	27.3	24.7	30.8	145	137	79.8	4.8	52.2	329	101	80.1	78.8	44.9	44.8	96.7
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	55.8	50.8	54.3	53.3	57.9	57.3	58.8	92.2	97.2	78.9	80.3	87.9	159	120	52.1	51.5	63.6	52.4	86.3
Magnesium (diss)	mg/L	-	-	-	-	0.05	5.47	4.78	4.84	4.39	5.57	5.43	5.65	7.04	7.94	6.58	7.2	6.62	12.6	9.37	4.84	4.82	5.44	4.3	8.2
Potassium (diss)	mg/L	-	-	-	-	0.05	11.1	12.8	9.16	13.2	9.22	10.1	8.02	12.9	11.4	12.9	7.92	11.5	13.4	13.6	8.18	8.2	11.6	9.45	11
Sodium (diss)	mg/L	104.495	200	-	-	0.05	5.63	8.07	7.85	14.1	10.2	10.5	8.16	29.1	13.6	20.4	14.8	22.4	48.4	29.6	16	15.7	22.7	19.1	25.3
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	134	135	130	162	132	156	154	163	149	180	137	211	227	317	165	161	234	232	163
Ammonia as N	mg/L	-	-	-	-	0.02	0.19	1.37	0.14	2.88	0.13	0.35	0.09	1.36	0.04	3.04	0.2	1.05	0.02	1.77	1.13	1.12	3.2	3.54	0.89
Chemical Oxygen Demand	mg/L	-	-	-	-	4	1190	18	8	12	<5	16	10	20	21	32	<5	31	<5	39	36	31	55	53	<5
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	2.8	3.5	7.3	3.6	3.9	3.6	7.5	9.3	8.7	12.2	4.8	12.4	10.2	12.8	8.6	8.7	15.3	13.6	8
Electrical Conductivity	uS/cm	-	-	-	-	1	356	341	374	436	405	401	389	707	737	555	553	663	1160	818	621	617	552	551	611
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	161.9	146.5	155.5	151.2	167.5	165.4	170.1	259.2	275.4	224.1	230.2	246.7	448.9	338.2	150	148.4	181.2	148.6	249.3
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.43	7.19	6.99	6.73	6.84	7.31	7.19	7.05	7.49	7.32	7.05	7.6	6.61	7.14	6.42	6.46	6.77	6.68	6.57
Total Dissolved Solids	mg/L	314	500	-	-	10	224	210	194	234	234	218	236	406	400	390	340	390	782	486	288	286	346	316	336
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.004	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	<0.004
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	0.24	-	-	-	-	-	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.14	0.17	0.14	0.22	0.12	0.11	0.15	0.24	0.24	0.19	0.13	0.19	0.16	0.23	0.14	0.14	0.24	0.23	0.128
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.13	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.13	0.15	0.13	0.18	0.17	0.14	0.11	0.28	0.23	0.62	0.18	0.38	1.08	0.34	0.08	0.08	0.29	0.28	0.529
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0001	<0.0001	0	0	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0	0	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.04	0.02	0.02	0.05	0.05	0.0195
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0	0	0.01	<0.003	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.005
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.27	10.4	6.61	6.69	25.8	25.6	6.46
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	0.74	0.46	0.75	0.47	0.48	0.56	0.77	0.97	1.23	0.89	0.87	1.37	1.62	2.87	1.18	1.13	2.03	2.05	2.19
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel (diss)	mg/L	-	-	0.025	-	0.001	0.01	0	0.01	<0.003	0.01	0.01	0	0.01	0.01	0.01	<0.003	0.01	0.01	0.01	0.01	0	0.01	0.01	0.008
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	7.19	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.73	5.38	5.93	5.01	4.82	4.81	6.21	5.51	<0.002	6.37	6.6	4.06	5.75	5.45	4.69	4.26	5.61	5.42	6.5
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.24	0.23	0.25	0.27	0.28	0.36	0.25	0.6	0.45	0.41	0.38	0.48	0.63	0.77	0.32	0.31	0.4	0.4	0.414
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0	<0.002	<0.002	<0.002	<0.002	0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	<0.005	0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR5-10	AQC-GW-F21 (H	HR5-10	HR5-10	QC-GW1-F22 (H	HR5-10	HR5-10	HR5-10	HR5-10	HR5-10	QAQC-GW1 (HR	HR5-10	HR6-19	HR6-19	HR6-19	HR6-19	HR6-19	HR6-19
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2021-Oct-21	2021-Oct-21	2022-May-02	2022-Oct-20	2022-Oct-20	2023-May-03	2023-Oct-17	2024-Apr-16	2024-Oct-28	2025-May-07	2025-May-07	2025-Oct-22	2020-May-08	2020-Oct-08	2021-Apr-22	2021-Oct-21	2022-May-02	2022-Oct-20	2023-May-03
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	37.5	37.6	42.9	48	52.4	38.3	38	76	51	44	44	30	3.12	1.99	3.27	2.01	2	1.26	4.16
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	<0.05	<0.05	0.08	<0.05	<0.05	0.19	<0.1	<0.1	<0.1	0.29	0.28	<0.1	<0.1	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	500	-	-	0.1	155	156	42.1	22.5	23.5	43.9	52	15	53	34	34	50	68.4	10.9	42.2	13.8	26.3	12.2	59.7
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	125	122	81.9	105	89.3	72.1	150	87	110	56	56	120	111	84.7	116	120	88.9	92.2	107
Magnesium (diss)	mg/L	-	-	-	-	0.05	10.9	10.5	8.66	7.71	7.88	6.72	14	7.6	13	5.5	5.4	12	4.28	2.61	4.32	3.64	3.06	2.74	4.82
Potassium (diss)	mg/L	-	-	-	-	0.05	13.9	13.3	18.6	13.6	19.5	9.51	15	11	21	9	8.8	12	4.59	3.15	4.35	4.56	3.52	2.04	5.82
Sodium (diss)	mg/L	104.495	200	-	-	0.05	33.7	32.9	32.7	30.7	23	25.8	49	35	42	16	16	35	4.27	2.64	5.35	5.66	4.1	3.64	6.83
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	297	296	277	273	263	178	430	230	330	220	220	410	271	261	272	333	232	180	279
Ammonia as N	mg/L	-	-	-	-	0.02	1.79	1.85	4.92	1.82	1.8	1.43	6.9	11	11	4	3.9	-	2.67	1.36	1.92	3.4	1.54	1.23	4.28
Chemical Oxygen Demand	mg/L	-	-	-	-	4	64	68	65	56	73	37	100	62	120	30	29	61	26	23	<5	20	22	30	56
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	17.4	18.4	25	21.4	20.8	10.2	33	15	31	6.7	7	22	4.4	4	5	6.4	4.1	5.2	6.2
Electrical Conductivity	uS/cm	-	-	-	-	1	959	962	742	798	777	541	1000	700	910	650	650	960	777	452	606	650	503	396	624
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	357	347.9	240.2	293.9	255.4	-	-	-	-	-	-	-	294.8	222.2	307.4	314.6	234.6	241.5	-
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.7	6.75	6.73	6.79	6.86	7.06	7.07	7.1	7.34	7.26	7.21	6.99	6.62	7.14	7.08	6.91	6.82	7.08	7.34
Total Dissolved Solids	mg/L	314	500	-	-	10	590	596	402	426	404	318	620	390	525	360	365	530	334	280	322	356	218	218	350
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.018	0.018	0.062	0.091	0.05	0.004	0.04	0.031	0.025	0.012	0.011	0.019	0.01	0.01	<0.004	0.207	0.03	0.046	0.015
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.197	0.2	0.37	0.379	0.384	0.137	0.44	0.26	0.43	0.14	0.14	0.3	0.06	0.05	0.059	0.084	0.056	0.04	0.043
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	1.12	1.15	0.273	0.311	0.285	0.302	0.3	0.14	0.73	0.18	0.18	0.24	0.09	0.06	0.119	0.155	0.064	0.064	0.103
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	0.0001	0.0004	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	0	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	0.003	<0.003	<0.003	<0.002	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	0.003	<0.003	<0.002	<0.002
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0.0585	0.0593	0.0467	0.0465	0.0459	0.0196	0.07	0.033	0.048	0.012	0.012	0.036	<0.0005	0	<0.0005	0.0008	<0.0005	0.002	<0.0005
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	0.003	0.004	<0.002	<0.001	0.002	0.001	0.0034	0.0024	0.0021	0.0029	0.0028	0.0049	<0.002	0	<0.002	0.003	<0.002	<0.001	<0.001
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	29.2	29.7	61.7	62.6	66.7	11.2	49	23	47	10	9.9	21	30	19.3	26.9	20.6	21.6	24.1	20.5
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	0.001	<0.001	<0.0005	<0.0005
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	2.58	2.6	3.53	2.34	2.29	1.11	3.1	1.5	4.4	0.95	0.94	2.3	0.5	1.62	0.402	0.336	0.298	0.48	0.343
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.00084	0.00072	0.00065	<0.0005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel (diss)	mg/L	-	-	0.025	-	0.001	0.008	0.008	0.009	0.005	0.006	0.004	0.0081	0.0052	0.0093	0.0033	0.0033	0.0056	<0.003	0	<0.003	<0.003	0.001	0.003	<0.001
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	6.86	6.9	5.37	7.06	6.32	6.11	6.4	5.5	5.6	4.7	4.7	6.3	3.07	6.77	3.53	5.13	3.29	6.41	3.6
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.566	0.573	0.411	0.503	0.458	0.348	1	0.67	0.49	0.32	0.31	0.94	0.42	0.3	0.39	0.458	0.371	0.348	0.327
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.000054	0.00011	0.000076	0.00011	0.00013	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	0.003	0.003	0.003	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	0.007	<0.002	0.003	<0.002
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.002	<0.002	0.003	0.002	0.002	<0.002	0.0036	0.002	0.002	0.00072	0.00073	0.0016	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.005	0.009	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR6-19	HR6-19	HR6-19	HR6-19	HR7-19	AQC GW-F19 (HI	HR7-19	HR7-19	HR7-19	HR7-19	HR7-19	HR7-19	HR7-19	HR7-19	HR7-19	HR7-19	HR7-19	HR8-19
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2023-Oct-17	2024-Apr-16	2024-Oct-28	2025-May-07	2019-Oct-23	2019-Oct-23	2020-May-08	2020-Oct-08	2021-Apr-22	2021-Oct-21	2022-May-02	2022-Oct-20	2023-May-03	2023-Oct-17	2024-Apr-16	2024-Oct-28	2025-May-07	2025-Oct-22	2019-Oct-23
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	<1	2.2	<1	1.8	34.7	34.7	57.1	28.4	26.3	15.3	55.5	26	38.1	22	48	24	20	30	2.44
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	<0.1	<0.1	<0.1	<0.1	0.46	0.46	0.85	<0.25	0.8	0.43	0.07	<0.05	<0.05	0.36	<0.1	1.25	0.57	<0.1	0.21
Sulphate	mg/L	-	500	-	-	0.1	8.7	75	4.8	28	12	12	67.7	23	71.1	57.6	25	33.2	30.9	14	25	37	73	14	6.84
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	80	130	34	97	44.7	44.4	114	56.9	116	35.9	83.4	137	102	60	72	90	91	76	8.05
Magnesium (diss)	mg/L	-	-	-	-	0.05	2.9	4.8	1.4	3.3	5.9	5.79	15.8	7.92	13.1	3.93	7.52	8.97	8.69	6.1	8.6	9.1	9.5	10	0.99
Potassium (diss)	mg/L	-	-	-	-	0.05	3.4	4	1.2	3.3	20.6	20.3	28.5	24.9	27.7	1.97	18	20.3	22.2	21	24	19	19	30	1.04
Sodium (diss)	mg/L	104.495	200	-	-	0.05	3.3	6.4	1.4	4.4	24.9	24.7	72.1	56.6	36.9	10.5	30.6	40.6	37.2	39	49	35	24	45	2.61
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	200	280	130	260	225	226	401	431	367	246	278	329	403	260	310	350	310	370	27
Ammonia as N	mg/L	-	-	-	-	0.02	2.7	3.6	0.92	2.7	11	10.9	12.4	19.9	16.4	6.94	7.92	7.4	13.7	13	17	12	16	27	0.06
Chemical Oxygen Demand	mg/L	-	-	-	-	4	20	27	35	9.3	66	69	114	95	43	35	55	14	74	45	73	74	48	58	24
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	4.5	4.9	4.1	4.2	12.6	12	39.1	38.5	25.8	14	23.3	26.6	32.4	13	23	17	17	24	1.1
Electrical Conductivity	uS/cm	-	-	-	-	1	400	640	250	560	555	557	1320	862	926	633	759	861	921	620	760	820	830	860	75
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	-	-	-	-	135.9	134.7	349.7	174.7	343.6	105.8	239.2	379	-	-	-	-	-	-	24.2
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.22	7.1	7.26	7.34	7.02	7.09	6.5	7.33	6.96	6.84	6.78	6.95	7.22	7.07	7.06	7.73	6.91	7.12	6.69
Total Dissolved Solids	mg/L	314	500	-	-	10	220	360	180	375	286	274	584	432	512	360	402	454	502	320	405	460	490	415	84
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.018	0.014	0.023	0.012	0.04	0.04	0.18	0.05	0.01	0.034	0.037	0.012	0.021	0.02	0.022	0.022	0.039	0.021	0.02
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.037	0.066	0.018	0.049	0.32	0.33	0.6	0.44	0.494	0.286	0.273	0.326	0.398	0.3	0.38	0.37	0.47	0.41	0.01
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0005
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.069	0.099	0.023	0.081	0.23	0.23	0.73	0.59	0.98	0.579	0.206	0.728	0.502	0.29	0.28	0.66	0.7	0.53	0.02
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0.0019	<0.0005	0.00053	0.00087	0.07	0.07	0.08	0.08	0.0445	0.031	0.0586	0.0575	0.0572	0.042	0.055	0.03	0.027	0.044	<0.0005
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	0.0013	<0.0009	0.002	<0.0009	0.01	0.01	0.01	0	0.01	0.008	0.004	0.008	0.005	0.0041	0.0042	0.0062	0.0049	0.0013	0
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	21	26	7.7	17	27.9	28	66	54	24.1	14.6	36.4	53.5	47.6	38	50	26	24	44	0.03
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	0.33	0.41	0.18	0.28	2.76	2.77	6.21	4.41	4.41	2.59	3.56	3.6	3.17	1.8	2.3	1.7	1.9	1.9	0.05
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	0.00062	0.0011	0.00054	0.00054	0.0013	<0.002
Nickel (diss)	mg/L	-	-	0.025	-	0.001	0.0023	0.001	0.0012	0.0014	0.01	0.01	0.01	0.01	0.012	0.006	0.012	0.002	0.009	0.008	0.012	0.0082	0.008	0.009	<0.003
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.8	3.6	5	3	9.39	9.49	7.29	10.9	8.27	8.12	7.77	7.94	9.38	11	9.9	7.4	6.4	9.1	4.29
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.26	0.45	0.12	0.34	0.28	0.27	0.59	0.49	0.556	0.318	0.378	0.405	0.363	0.26	0.32	0.35	0.43	0.4	0.07
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0003	0	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.000087	0.000074	0.00011	0.00011	<0.00005	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.005	<0.005	<0.005	<0.005	0	<0.002	0.01	<0.002	0.007	<0.002	0.007	0.004	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	0.00084	<0.0005	0.00087	<0.0005	<0.002	<0.002	0	0.01	0.002	<0.002	0.003	0.003	0.003	0.0019	0.0031	0.0018	0.0015	0.004	<0.002
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	0.011	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	0.035	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Appendix E-1 - Historic Groundwater Chemistry Hickey Road WDS

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR8-19	HR8-19	HR8-19	HR8-19	HR8-19	HR8-19	HR8-19	HR8-19	HR8-19	HR8-19	HR8-19	HR8-19	HR9-21	QC-GW-SU21 (H	HR9-21	HR9-21	HR9-21	HR9-21	HR9-21
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2020-May-08	2020-Oct-08	2021-Apr-22	2021-Oct-21	2022-May-02	2022-Oct-20	2023-May-03	2023-Oct-17	2024-Apr-16	2024-Oct-28	2025-May-07	2025-Oct-22	2021-Aug-19	2021-Aug-19	2021-Oct-21	2022-May-02	2022-Oct-20	2023-May-03	2023-Oct-17
Anions						**Detection Limit**																			
Chloride	mg/L	128.75	250	-	-	0.1	14.5	3.78	4.53	3.56	27.4	6.05	4.64	5.9	4.6	3	11	1.3	4.33	4.35	1.21	0.82	1.67	0.79	<1
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	0.1	0.25	0.42	0.65	0.07	0.48	0.63	0.22	1.25	0.18	0.17	0.15	0.48	0.47	0.1	0.1	0.59	0.45	1.28
Sulphate	mg/L	-	500	-	-	0.1	13.9	8.53	13.3	10.2	6.46	10.6	13.8	5.5	9.7	8.2	8.5	3	5.06	5.04	5.72	4.83	6.41	5.14	4.7
Cations																									
Calcium (diss)	mg/L	-	-	-	-	0.05	41.5	12.6	25.2	77.7	54.2	44.1	21	11	15	36	39	9.6	8.6	8.39	3.53	2.89	7.1	3.47	5.2
Magnesium (diss)	mg/L	-	-	-	-	0.05	4.54	1.37	2.7	6.03	7.6	3.81	2.15	1.1	1.7	3.5	4	0.93	1.24	1.22	0.54	0.48	0.94	0.5	0.74
Potassium (diss)	mg/L	-	-	-	-	0.05	2.07	1.25	1.5	14.7	12.5	1.97	1.43	1	1.2	1.8	1.7	0.83	1.48	1.47	0.96	0.66	1.85	0.77	1.4
Sodium (diss)	mg/L	104.495	200	-	-	0.05	8.98	2.9	3.25	17.9	42.9	7.98	4.88	2.9	5.2	14	7.8	1.9	4.12	4.1	1.62	1.4	4.34	1.67	1.8
General Chemistry																									
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	117	36	63	122	276	79	59	29	35	99	110	28	33	32	13	10	18	8	8.5
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	<0.02	0.07	5.85	0.03	<0.02	0.075	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	0.09	<0.02	<0.02	<0.02	<0.05
Chemical Oxygen Demand	mg/L	-	-	-	-	4	18	14	<5	<5	34	13	<5	8.6	9.3	20	5.9	<4	<5	<5	<5	5	9	<5	7.9
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	5.1	1.5	2.4	4.6	18	4.3	2	1.3	2	4.1	4.6	2	5.9	5.9	1.9	2	1.8	1.3	1.8
Electrical Conductivity	uS/cm	-	-	-	-	1	359	91	171	260	627	210	161	80	110	240	260	73	89	89	40	34	64	36	50
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	122.3	37.1	74	218.8	166.6	125.8	-	-	-	-	-	-	26.6	26	11	9.2	21.6	-	-
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		**6.44**	6.66	6.83	6.78	7	7.08	7.06	7.17	6.77	7.45	7.1	7.17	6.59	6.52	**6.43**	**6.37**	6.61	6.63	6.73
Total Dissolved Solids	mg/L	314	500	-	-	10	138	54	108	164	334	120	94	80	55	180	185	40	72	66	36	<10	52	34	45
Metals																									
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.02	0.02	<0.004	0.018	0.022	0.013	0.012	0.0069	0.0087	0.0076	0.0077	<0.0049	0.028	0.029	0.034	0.127	0.038	0.01	0.015
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.07	0.01	0.031	0.053	0.399	0.032	0.025	0.013	0.022	0.033	0.058	0.0088	0.02	0.02	0.011	0.012	0.015	0.012	0.016
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	0.09	0.02	0.028	0.062	0.147	0.039	0.022	0.01	0.012	0.078	0.079	<0.01	0.016	0.019	<0.01	<0.01	0.013	<0.01	<0.01
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0	<0.0005	<0.0005	<0.0005	0.0051	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0012	0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	0	<0.002	<0.002	0.005	0.035	0.006	0.001	<0.0009	<0.0009	0.005	0.0025	<0.0009	<0.002	<0.002	0.003	<0.002	0.002	<0.001	<0.0009
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	0.01	0.02	0.03	<0.01	0.09	0.025	0.012	<0.1	<0.1	<0.1	<0.1	<0.1	0.023	<0.01	<0.01	0.046	<0.01	<0.01	<0.1
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	0.1	0.01	0.004	0.01	5.53	0.193	0.008	0.003	0.0022	0.0089	0.0026	<0.002	0.06	0.063	0.006	0.008	0.015	0.005	0.059
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005
Nickel (diss)	mg/L	-	-	0.025	-	0.001	<0.003	<0.003	<0.003	<0.003	0.022	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.56	4.77	4.97	6.77	6.74	4.94	5.66	4.6	4.5	4.8	5.4	4.2	6.49	5.07	5.13	3.24	5.14	4.43	5.1
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Strontium (diss)	mg/L	-	-	-	-	0.001	0.3	0.09	0.178	0.276	0.669	0.208	0.122	0.07	0.1	0.26	0.25	0.058	0.109	0.104	0.042	0.032	0.072	0.029	0.062
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	<0.002	<0.002	0.003	<0.002	<0.002	<0.005
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005
Zinc (diss)	mg/L	2.50125	5	-	0.02	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.016	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Sample ID	HR9-21	HR9-21	HR9-21	HR9-21	HR10-21	HR10-21	HR10-21	HR10-21	HR10-21	HR10-21	HR10-21	HR10-21	HR10-21
Parameter	Units	RUV-HR	ODWQS	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2024-Apr-16	2024-Oct-28	2025-May-07	2025-Oct-22	2021-Aug-19	2021-Oct-21	2022-May-02	2022-Oct-20	2023-May-03	2023-Oct-17	2024-Apr-16	2024-Oct-28	2025-May-07	2025-Oct-22
Anions						Detection Limit														
Chloride	mg/L	128.75	250	-	-	0.1	<1	1.1	<1	1.5	2.52	2.46	4.87	3.23	3.95	<1	2.4	1.1	3.5	2.2
Fluoride	mg/L	-	1.5	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.32125	10	-	-	0.05	0.55	0.58	0.13	0.45	0.28	0.2	0.45	0.38	1.85	0.4	1.51	0.46	0.81	0.24
Sulphate	mg/L	-	500	-	-	0.1	5.6	4.9	4	4.9	3.48	3.8	3.21	3.92	3.59	5.2	4.3	4.1	3.2	5.6
Cations																				
Calcium (diss)	mg/L	-	-	-	-	0.05	3.4	2.9	2.4	3.1	8.97	3.5	4.4	5.12	6.56	4.2	7.5	4.1	5.4	3.9
Magnesium (diss)	mg/L	-	-	-	-	0.05	0.51	0.45	0.37	0.48	1.46	0.71	0.9	0.89	1.34	0.81	1.5	0.78	1	0.73
Potassium (diss)	mg/L	-	-	-	-	0.05	1.2	1.1	0.64	1.2	1.24	0.97	1.04	0.67	1.18	1	1.2	0.89	1	0.92
Sodium (diss)	mg/L	104.495	200	-	-	0.05	1.6	1.8	1.1	2	2.84	2.13	2.59	2.88	3.16	2.2	3	2.1	2.5	2.1
General Chemistry																				
Alkalinity (as CaCO3)	mg/L	279.5	30 - 500	Calculated	-	1	7.5	6.7	9	8.4	33	14	8	15	18	13	26	15	20	12
Ammonia as N	mg/L	-	-	-	-	0.02	0.13	<0.05	<0.05	<0.05	<0.02	0.14	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Chemical Oxygen Demand	mg/L	-	-	-	-	4	7.9	19	<4	<4	<5	<5	<5	<5	<5	<4	5.7	13	<4	<4
Dissolved Organic Carbon	mg/L	3.7	5	-	-	0.4	2.1	1.7	1.4	2.3	4	2.3	1	1.3	1.4	1.4	1.9	1.6	1	2
Electrical Conductivity	uS/cm	-	-	-	-	1	34	37	28	39	83	42	53	51	69	46	67	23	62	44
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	0.5	-	-	-	-	28.4	11.7	14.7	16.4	-	-	-	-	-	-
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.45	6.89	6.81	6.75	7.02	6.41	6.27	6.76	6.84	6.97	6.77	7.32	6.93	6.82
Total Dissolved Solids	mg/L	314	500	-	-	10	<10	75	20	<10	66	62	22	54	48	60	45	110	70	70
Metals																				
Aluminum (diss, 0.45 µm)	mg/L	0.055	0.1	-	Calculated	0.004	0.01	0.019	0.012	0.012	0.043	0.047	0.016	0.061	0.016	0.0066	0.032	0.051	0.0069	0.023
Antimony (diss)	mg/L	-	0.006	-	0.02		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (diss)	mg/L	0.301375	1	-	-	0.002	0.012	0.01	0.0065	0.012	0.005	0.004	0.004	0.004	0.005	0.0035	0.0065	0.0048	0.0052	0.0043
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Boron (diss)	mg/L	1.265	5	-	0.2	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (diss)	mg/L	0.0012875	0.005	-	Calculated	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Chromium (diss)	mg/L	0.013625	0.05	-	-	0.002	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (diss)	mg/L	0.500575	1	-	Calculated	0.0009	<0.0009	0.0051	<0.0009	<0.0009	0.002	<0.002	<0.002	0.002	<0.001	<0.0009	0.0016	0.0019	<0.0009	<0.0009
Iron (diss)	mg/L	0.155	0.3	0.3	-	0.01	<0.1	<0.1	<0.1	<0.1	0.02	<0.01	0.018	0.016	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1
Lead (diss)	mg/L	0.002875	0.01	-	Calculated	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.03	0.05	-	-	0.002	0.015	0.0078	0.0034	0.0056	0.02	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel (diss)	mg/L	-	-	0.025	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium (diss)	mg/L	-	0.05	0.1	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	4.4	4.6	3.7	4.6	4.85	3.87	3.46	5.61	4.53	4.1	4.5	4.1	3.8	3.9
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	**0.0002**	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Strontium (diss)	mg/L	-	-	-	-	0.001	0.045	0.042	0.027	0.048	0.079	0.032	0.057	0.054	0.059	0.04	0.069	0.038	0.056	0.039
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.005	<0.005	<0.005	<0.005	<0.002	0.003	<0.002	0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc (diss)	mg/L	2.50125	5	-	0.02	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	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-HR	Reasonable Use Values Hickey Road
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Appendix E

E-2 Historical Surface Water Chemistry

Hastings Highlands Analytical Chemistry Results: Anions, Cations, FPs, GenChem, Met in Surface Water						Sample ID	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample Date	2007-May-03	2008-May-08	2008-Oct-09	2009-Jun-04	2009-Oct-21	2010-May-18	2010-Oct-19	2011-May-19	2012-Apr-16	2013-Apr-16	2013-Oct-30	2014-May-12	2014-Oct-16	2015-May-05	2016-Apr-27	2017-May-12
Anions						Detection Limit																
Chloride	mg/L	-	-	180	128	0.1	<1	1	1	2	1	1	<1	<1	<1	0.53	0.64	0.58	0.49	0.72	0.56	0.45
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	<0.1	<0.1	0.14	<0.1	<0.1	<0.1	0.25	0.2	0.16	0.78	0.16	<0.05	0.28	0.18	0.11
Nitrite as N	mg/L	-	-	-	-	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	9	9	10	9	8	9	8	7	9	5.95	12.2	7.59	9.13	-	6.83	6.52
Cations																						
Calcium (tot)	mg/L	-	-	-	-	0.16	4	12	24	16	17	17	18	14	14.7	8.55	25.7	14.9	24.3	16.7	12	12.2
Magnesium (tot)	mg/L	-	-	-	-	0.05	1	1	2	2	2	1	2	1	1630	1.04	2.07	1.45	1.91	1.52	1.2	1.18
Potassium (tot)	mg/L	-	-	-	-	0.2	<1	<1	<1	<1	<1	<1	<1	<1	795	0.73	1.12	0.84	1.04	0.9	0.7	0.65
Sodium (tot)	mg/L	-	-	-	-	0.1	<2	<2	<2	2	<2	<2	<2	<2	903	0.74	1.22	0.9	1.16	0.97	0.79	0.78
Field Parameters																						
pH (Field)	pH units	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature	deg. C	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																						
Alkalinity (as CaCO3)	mg/L	Calculated	-	-	-	1	7	28	61	43	56	50	53	43	42	17.7	51	37	63	36	34	38
Ammonia as N	mg/L	-	-	-	-	0.02	0.03	<0.00021	<0.02	<0.02	<0.02	0.00007	<0.02	0.1	<0.01	<0.02	0.00002	<0.02	0.18	<0.02	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	2	<1	<1	<1	<1	<1	<2	<5	12	<5	<5	<5	<5	<5
Chemical Oxygen Demand	mg/L	-	-	-	-	4	-	5	5	8	6	8	8	13	<10	<5	311	<5	9	<5	-	6
Electrical Conductivity	uS/cm	-	-	-	-	1	39	79	145	105	125	124	123	99	118	55	141	93	152	98	79	95
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	14.1	34.1	68.2	48.2	50.7	46.6	53.2	39.1	6749	25.6	72.7	43.2	68.5	48	34.9	35.3
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 8.5	-	6 - 9	-		6	7.36	7.62	7.41	7.56	7.78	7.66	7.41	7.4	7.08	7.65	7.54	7.21	7.7	7.71	7.21
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-
Total Dissolved Solids	mg/L	-	-	-	-	10	25	51	94	68	81	81	80	64	414	36	98	58	98	62	56	44
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.24	0.29	0.21	<0.1	<0.1	0.11	0.15	0.35	<0.1	0.39	9.04	0.4	1	0.22	0.27	0.13
Total Phosphorus	mg/L	0.03	-	-	-	0.02	0.04	<0.01	0.07	0.06	<0.01	<0.01	0.01	<0.01	<0.01	0.02	0.49	<0.02	0.05	<0.01	0.01	<0.01
Total Suspended Solids	mg/L	-	-	-	-	10	36	17	570	85	5	<2	3	<2	9	<10	164	<10	<10	<10	<10	<10
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																						
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	0.11	0.02	0.24	0.17	0.04	0.02	0.02	0.02	0.015	0.049	0.019	0.019	0.011	0.018	0.02	0.022
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (tot)	mg/L	-	-	2.3	-	0.002	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.014	0.009	0.044	0.012	0.022	0.012	0.011	0.014
Beryllium (tot)	mg/L	Calculated	-	-	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	<0.01	<0.01	0.017	0.015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0007	<0.0001	<0.0001	<0.0001	<0.0001	-
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	-
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.001	0.001	0.003	0.003	0.001	0.001	0.001	0.001	0.0011	<0.002	0.017	<0.002	0.004	<0.002	<0.002	<0.002
Iron (tot)	mg/L	0.3	-	1	-	0.01	<0.03	<0.03	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1	<0.01	0.11	<0.01	0.068	<0.01	<0.01	<0.01
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	<0.01	<0.01	0.04	0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.006	0.206	<0.002	0.047	<0.002	<0.002	<0.002
Molybdenum (tot)	mg/L	-	0.04	-	-	0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0012	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-
Nickel (tot)	mg/L	0.025	-	-	-	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.003	0.003	<0.003	0.007	<0.003	<0.003	-
Silicon (tot)	mg/L	-	-	-	-	0.1	3.8	3.4	5.5	3.8	4.5	3.9	4.2	3.4	3.22	2.95	4.57	3.13	4.36	3.03	3	-
Silver (tot)	mg/L	0.0001	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-
Strontium (tot)	mg/L	-	-	-	-	0.001	0.035	0.06	0.093	0.103	0.105	0.101	0.114	0.091	0.089	0.047	0.169	0.077	0.129	0.072	0.066	-
Thallium (tot)	mg/L	-	0.0003	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	-
Titanium (tot)	mg/L	-	-	-	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-
Vanadium (tot)	mg/L	-	0.006	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	-
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	0.39	<0.005	0.007	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, FPs, GenChem, Met in Surface Water						Sample ID	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	HR-SW1	AQC SW-F20 (HR	HR-SW1	HR-SW1	HR-SW1	AQC SW-S22 (HR	HR-SW1	HR-SW1	HR-SW1	HR-SW2	HR-SW2
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample Date	2017-Oct-24	2018-May-09	2018-Oct-23	2019-May-08	2020-May-08	2020-Oct-08	2020-Oct-08	2021-Apr-22	2021-Oct-21	2022-May-02	2022-May-02	2023-May-03	2024-Apr-16	2025-May-07	2007-May-03	2008-May-08
Anions						Detection Limit																
Chloride	mg/L	-	-	180	128	0.1	0.46	0.49	0.61	0.56	0.63	0.67	0.66	0.57	3.83	0.45	0.43	0.39	<1	<1	<1	1
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	0.29	0.32	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.05	0.25	0.68	0.93	0.4	0.39	0.43	0.46	0.07	0.34	0.33	0.18	0.29	0.32	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.1	<0.1
Sulphate	mg/L	-	-	100	-	0.1	9.27	5.74	8.38	5.26	7.24	6.87	6.84	7.14	5.85	5.93	5.82	4.67	6.3	5.4	9	9
Cations																						
Calcium (tot)	mg/L	-	-	-	-	0.16	22.4	12.6	21	11.1	13.03	20.81	19.24	15.4	23	14.5	15.4	9.5	13	15	10	10
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.92	1.14	1.62	1.17	1.35	1.73	1.59	1.49	2.08	1.46	1.56	0.86	1.2	1.3	1	1
Potassium (tot)	mg/L	-	-	-	-	0.2	1.13	0.75	1.02	0.78	0.73	1.06	1	1	1.61	<1.15	1.2	0.52	0.78	0.74	<1	<1
Sodium (tot)	mg/L	-	-	-	-	0.1	1.08	0.75	1.02	0.8	0.84	1.18	1.08	1.29	1.38	0.96	0.67	0.77	0.8	0.93	<2	<2
Field Parameters																						
pH (Field)	pH units	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	7	7.2	-	-
Temperature	deg. C	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	7.3	9.9	-	-
General Chemistry																						
Alkalinity (as CaCO3)	mg/L	Calculated	-	-	-	1	61	36	65	36	41	52	51	35	58	33	31	29	35	49	27	23
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.0000396	0.0000745	<0.02	<0.02	<0.02	<0.02	<0.02	0.11	<0.02	<0.02	<0.02	<0.05	<0.05	0.12	<0.00057
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	7	<5	<5	<5	<5	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<1
Chemical Oxygen Demand	mg/L	-	-	-	-	4	394	<5	251	<5	<5	15	10	<5	7	7	<5	<5	7.9	<4	-	10
Electrical Conductivity	uS/cm	-	-	-	-	1	124	88	142	81	101	112	111	93	115	87	86	67	80	91	71	65
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	63.8	36.2	59.1	32.5	38.1	59.1	54.6	44.6	66	42.2	44.9	27.3	39	41	29.1	29.1
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.34	7.19	7.64	6.64	7.44	6.84	6.87	7.62	7.37	6.96	6.85	7.21	7.35	7.52	6.42	7.31
Phenols	mg/L	0.001	-	0.04	0.004	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	74	40	78	70	52	74	68	38	80	60	54	52	30	100	46	42
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.32	0.31	0.47	<0.1	0.29	0.26	0.24	<0.1	0.15	0.13	0.14	0.21	<0.1	0.12	0.23	0.29
Total Phosphorus	mg/L	0.03	-	-	-	0.02	0.94	<0.02	0.73	0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.06	0.04	<0.02	<0.02	<0.02	0.02	<0.01
Total Suspended Solids	mg/L	-	-	-	-	10	468	<10	26	<10	<10	15	46	<10	<10	27	49	<10	<10	<10	71	<2
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	-	-	-	-	-	-	<0.000002	<0.00061	<0.00061	-	-
Metals																						
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	0.029	0.015	0.095	0.024	0.022	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	0.017	0.02	0.01	-	0.022	0.051	0.017	0.018	0.021	-	-	-	-	-	0.34	0.05
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	0.046	0.035	0.092	0.028	0.057	-	-	0.07	-	-	-	-
Barium (tot)	mg/L	-	-	2.3	-	0.002	0.052	0.013	0.056	0.014	0.01	0.017	0.019	0.011	0.016	0.019	0.021	0.013	0.011	0.013	0.02	0.01
Beryllium (tot)	mg/L	Calculated	-	-	-	0.0005	-	0.056	0.013	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.094	<0.01	<0.01	<0.01	<0.01	0.018	0.012	<0.01	0.014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	0.001
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.001	<0.0005	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0002	<0.0002
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.022	0.001	0.022	<0.002	0.002	0.003	0.003	<0.002	<0.002	0.006	0.005	0.001	0.0012	0.0017	0.002	0.001
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.54	<0.01	0.63	<0.01	0.015	<0.01	0.016	<0.01	0.018	0.362	0.385	0.023	<0.1	<0.1	0.19	0.07
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	0.004	<0.001	0.007	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002	<0.001	<0.0005	<0.0005	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	0.265	<0.002	0.288	0.006	<0.002	<0.002	0.008	<0.002	0.002	0.053	0.043	<0.002	<0.002	0.002	0.02	<0.01
Molybdenum (tot)	mg/L	-	0.04	-	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005	<0.005
Nickel (tot)	mg/L	0.025	-	-	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005	<0.005
Silicon (tot)	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.1	3.1
Silver (tot)	mg/L	0.0001	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001
Strontium (tot)	mg/L	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.053	0.054
Thallium (tot)	mg/L	-	0.0003	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001
Titanium (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
Vanadium (tot)	mg/L	-	0.006	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	0.008	<0.005	0.044	<0.005	<0.005	<0.005	<0.005	<0.005	<0.02	<0.02	<0.02	<0.02	<0.005	<0.005	<0.01	<0.01

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, FPs, GenChem, Met in Surface Water						Sample ID	HR-SW2	HR-SW2	HR-SW2	HR-SW2	HR-SW2	HR-SW2	HR-SW2	HR-SW2	HR-SW2	HR-SW2	HR-SW2	HR-SW2	AQC-SW-S19 (HR	HR-SW2	-QAQC SW-S20 (	HR-SW2
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample Date	2009-Jun-04	2010-May-18	2010-Oct-19	2011-May-19	2012-Apr-16	2013-Apr-16	2014-May-12	2015-May-05	2016-Apr-27	2017-May-12	2018-May-09	2019-May-08	2019-May-08	2020-May-08	2020-May-08	2021-Apr-22
Anions						Detection Limit																
Chloride	mg/L	-	-	180	128	0.1	2	1	2	2	<1	0.56	0.59	0.77	0.55	0.48	0.44	0.62	0.59	0.63	0.61	0.52
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.05	<0.05	<0.05	<0.05	0.06	0.3	0.3	<0.05	<0.05	<0.05
Nitrite as N	mg/L	-	-	-	-	0.01	<0.1	<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
Sulphate	mg/L	-	-	100	-	0.1	7	7	7	6	9	5.21	6.69	-	5.73	6.11	4.49	5.02	4.98	6.1	6.11	6.02
Cations																						
Calcium (tot)	mg/L	-	-	-	-	0.16	10	12	8	8	12.6	5.52	9.04	8.92	6.44	7.8	7.13	7.5	7.55	8.21	8.13	9.27
Magnesium (tot)	mg/L	-	-	-	-	0.05	1	2	1	1	1330	0.8	1.14	1.14	0.86	1.04	0.8	0.99	0.98	1.03	1.05	1.17
Potassium (tot)	mg/L	-	-	-	-	0.2	<1	<1	<1	<1	818	0.77	0.78	0.76	0.59	0.51	0.64	0.71	0.73	0.84	0.66	0.98
Sodium (tot)	mg/L	-	-	-	-	0.1	2	<2	<2	<2	1020	0.76	0.99	1.01	0.82	0.87	0.7	0.82	0.83	0.84	0.89	1.13
Field Parameters																						
pH (Field)	pH units	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature	deg. C	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																						
Alkalinity (as CaCO3)	mg/L	Calculated	-	-	-	1	31	32	23	27	23	10.2	19	18	18	25	31	27	25	23	17	24
Ammonia as N	mg/L	-	-	-	-	0.02	0.02	<0.02	0.00001	<0.02	0.03	0.11	0.0001	0.0001252	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	1	<1	3	<1	<2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	15	20	18	23	30	<5	6	14	-	7	<5	<5	<5	<5	<5	<5
Electrical Conductivity	uS/cm	-	-	-	-	1	73	86	60	63	82	38	62	60	48	67	52	59	58	69	69	62
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	29.1	38.2	24.1	24.1	5508.4	17.1	27.3	27	19.6	23.8	21.1	22.8	22.9	24.7	24.6	28
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.11	7.43	7.09	7.11	6.8	6.72	7.24	7.35	7.35	7.48	6.89	6.53	6.54	6.79	6.67	7.25
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	10	48	56	39	41	166	30	<20	40	42	30	22	62	48	40	44	<20
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.16	0.16	6.66	0.43	0.3	0.16	5.2	0.57	0.71	0.17	0.37	<0.1	<0.1	0.35	0.41	0.19
Total Phosphorus	mg/L	0.03	-	-	-	0.02	0.06	<0.01	0.01	<0.01	0.04	<0.02	<0.02	0.07	<0.01	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	20	4	617	3	13	<10	21	35	<10	<10	<10	<10	<10	134	154	<10
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																						
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	0.27	0.09	0.46	0.04	0.207	0.069	0.044	0.05	0.05	0.049	0.042	-	-	0.048	0.047	0.037
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	0.472	0.477	0.066
Barium (tot)	mg/L	-	-	2.3	-	0.002	0.02	0.03	0.02	0.01	0.017	0.008	0.013	0.014	0.01	0.015	0.013	0.013	0.013	0.013	0.013	0.012
Beryllium (tot)	mg/L	Calculated	-	-	-	0.0005	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	<0.01	0.01	<0.01	<0.01	0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	-	-	-	-	-	-	-
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0005	0.0004	0.0004	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.001	0.001	0.003	0.001	0.0016	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	0.003	0.003	<0.002
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.33	0.18	0.32	0.12	0.121	<0.01	<0.01	0.12	0.02	<0.01	0.14	<0.01	<0.01	0.419	0.39	0.051
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<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
Manganese (tot)	mg/L	-	-	-	-	0.002	0.07	0.1	0.05	0.01	0.032	0.013	<0.002	0.022	0.002	0.004	0.018	<0.002	<0.002	0.023	0.029	0.003
Molybdenum (tot)	mg/L	-	0.04	-	-	0.0005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	-	-
Nickel (tot)	mg/L	0.025	-	-	-	0.003	<0.005	<0.005	<0.005	<0.005	<0.001	<0.003	0.007	<0.003	<0.003	-	-	-	-	-	-	-
Silicon (tot)	mg/L	-	-	-	-	0.1	3.1	3	3.9	1.9	3.03	2.81	2.37	2.24	2.61	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-
Strontium (tot)	mg/L	-	-	-	-	0.001	0.076	0.082	0.059	0.049	0.06	0.032	0.054	0.052	0.043	-	-	-	-	-	-	-
Thallium (tot)	mg/L	-	0.0003	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003	<0.0003	<0.0003	-	-	-	-	-	-	-
Titanium (tot)	mg/L	-	-	-	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.005	<0.002	<0.002	0.003	<0.002	-	-	-	-	-	-	-
Vanadium (tot)	mg/L	-	0.006	-	-	0.001	<0.001	<0.001	0.001	<0.001	0.0008	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	-	-
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	<0.01	<0.01	<0.005	0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, FPs, GenChem, Met in Surface Water						Sample ID	HR-SW2	AQC SW-F21 (HR	HR-SW2	HR-SW2	HR-SW2	QAQC-SW1 (HR-S	HR-SW2	QAQC-SW1 (HR-S	HR-SW3	HR-SW3	HR-SW3	HR-SW3	HR-SW3	HR-SW3	HR-SW3	AQC SW-S21 (HR
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample Date	2021-Oct-21	2021-Oct-21	2022-May-02	2023-May-03	2024-Apr-16	2024-Apr-16	2025-May-07	2025-May-07	2014-May-12	2015-May-05	2016-Apr-27	2017-May-12	2018-May-09	2019-May-08	2021-Apr-22	2021-Apr-22
Anions						Detection Limit																
Chloride	mg/L	-	-	180	128	0.1	0.68	0.72	0.42	0.38	<1	<1	<1	<1	0.59	0.76	0.58	0.48	0.55	0.65	0.58	0.62
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	<0.05	0.07	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	0.21	<0.05	<0.05
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	3.29	2.82	4.76	4.18	5.6	5.5	4.1	4.3	6.67	-	6.36	6	4.64	5.55	5.44	5.37
Cations																						
Calcium (tot)	mg/L	-	-	-	-	0.16	13.7	11.6	7.71	5.45	8.3	7.9	8.7	8.8	8.69	8.63	6.96	7.8	6.98	7.01	8.82	9.07
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.97	1.69	0.93	0.76	1	1	1	1	1.1	1.08	0.91	1.04	0.82	0.92	1.13	1.1
Potassium (tot)	mg/L	-	-	-	-	0.2	2.19	1.7	<1.15	1.1	0.71	0.7	0.72	0.68	0.69	0.72	0.56	0.58	0.64	0.67	0.82	0.84
Sodium (tot)	mg/L	-	-	-	-	0.1	1.49	1.25	0.81	0.89	0.87	0.81	0.97	0.95	1.01	1.02	0.85	0.86	0.79	0.9	1.17	1.15
Field Parameters																						
pH (Field)	pH units	-	-	-	-		-	-	-	-	6.79	7	6.73	6.73	-	-	-	-	-	-	-	-
Temperature	deg. C	-	-	-	-		-	-	-	-	6.6	7.3	12	12	-	-	-	-	-	-	-	-
General Chemistry																						
Alkalinity (as CaCO3)	mg/L	Calculated	-	-	-	1	35	32	21	17	22	27	24	24	18	18	18	26	30	23	18	20
Ammonia as N	mg/L	-	-	-	-	0.02	0.09	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	0.0001715	<0.02	<0.02	0.00002	<0.02	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	5	5	<2	<2	<2	<2	<2	<2	<5	<5	<5	<5	<5	<5	<2	2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	101	23	<5	<5	11	13	7.3	6.6	12	21	-	9	<5	<5	<5	<5
Electrical Conductivity	uS/cm	-	-	-	-	1	72	72	56	49	54	55	60	60	59	58	51	70	53	56	55	55
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	42.3	35.9	23.1	16.7	26	27	27	26	26.2	26	21.1	23.8	20.8	21.3	26.7	27.2
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 8.5	-	6 - 9	-		6.99	6.89	6.73	7.03	7.03	7.37	7.17	7.22	7.07	6.85	7.38	7.67	6.82	6.47	7.12	7.05
Phenols	mg/L	0.001	-	0.04	0.004	0.001	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	10	60	58	36	50	60	85	45	35	40	46	38	40	<20	50	<20	32
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.64	0.28	0.15	<0.1	0.1	0.11	0.19	0.21	0.58	0.69	1.85	0.18	0.39	<0.1	0.29	0.31
Total Phosphorus	mg/L	0.03	-	-	-	0.02	0.49	0.52	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.11	<0.01	0.01	<0.02	<0.02	<0.02	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	650	96	<10	<10	<10	<10	<10	<10	13	25	<10	<10	<10	10	<10	<10
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	<0.000002	<0.00061	<0.00061	<0.00061	<0.00061	-	-	-	-	-	-	-	-
Metals																						
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	0.043	0.052	0.048	0.048	0.05	0.053	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	0.054	0.057	-	-	-	-	-	-	0.053	0.07	0.054	0.047	0.045	-	0.078	0.073
Aluminum (tot)	mg/L	-	-	-	-	0.004	1.01	0.919	-	0.041	-	-	-	-	-	-	-	-	-	-	0.11	0.148
Barium (tot)	mg/L	-	-	2.3	-	0.002	0.024	0.023	0.011	0.012	0.011	0.011	0.013	0.013	0.014	0.015	0.011	0.016	0.014	0.013	0.012	0.013
Beryllium (tot)	mg/L	Calculated	-	-	-	0.0005	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-	-	-
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.0001	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	-	-	-	-	-
Chromium (tot)	mg/L	-	-	0.064	-	0.003	-	-	-	-	-	-	-	-	<0.003	<0.003	<0.003	-	-	-	-	-
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0016	0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.003	0.003	0.005	0.002	0.0013	0.0012	0.0014	0.0014	<0.002	<0.002	<0.002	<0.002	0.001	<0.002	<0.002	0.002
Iron (tot)	mg/L	0.3	-	1	-	0.01	**1.59**	**1.28**	0.04	0.186	<0.1	<0.1	<0.1	<0.1	0.05	0.09	<0.01	<0.01	0.09	<0.01	0.141	0.214
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	0.001	0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	0.199	0.159	0.003	0.003	<0.002	<0.002	0.0021	<0.002	0.039	0.07	<0.002	0.004	0.073	0.006	0.021	0.032
Molybdenum (tot)	mg/L	-	0.04	-	-	0.0005	-	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	-	-	-	-	-
Nickel (tot)	mg/L	0.025	-	-	-	0.003	-	-	-	-	-	-	-	-	<0.003	<0.003	<0.003	-	-	-	-	-
Silicon (tot)	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	2.39	1.72	2.75	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.0001	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	-	-	-	-	-
Strontium (tot)	mg/L	-	-	-	-	0.001	-	-	-	-	-	-	-	-	0.052	0.048	0.043	-	-	-	-	-
Thallium (tot)	mg/L	-	0.0003	-	-	0.0001	-	-	-	-	-	-	-	-	<0.0003	<0.0003	<0.0003	-	-	-	-	-
Titanium (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	-	-	-	-	-
Vanadium (tot)	mg/L	-	0.006	-	-	0.001	-	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	-	-	-	-	-
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.02	<0.02	<0.02	<0.02	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, FPs, GenChem, Met in Surface Water						Sample ID	HR-SW3	HR-SW3	HR-SW3	QAQC-SW1 (HR-S	HR-SW3	HR-SW3	HR-SW4	HR-SW4	HR-SW4	HR-SW4	HR-SW4	HR-SW4	HR-SW4	HR-SW4
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample Date	2021-Oct-21	2022-May-02	2023-May-03	2023-May-03	2024-Apr-16	2025-May-07	2020-May-08	2020-Oct-08	2021-Apr-22	2021-Nov-15	2022-May-02	2023-May-03	2024-Apr-16	2025-May-07
Anions						Detection Limit														
Chloride	mg/L	-	-	180	128	0.1	1.27	0.44	0.44	0.45	1.3	<1	0.66	0.6	0.64	0.48	0.41	0.36	1.2	<1
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	<0.1	<0.1
Nitrate as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	0.13	0.28	0.15	0.08	0.06	<0.05	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
Sulphate	mg/L	-	-	100	-	0.1	0.71	4.64	4.76	4.75	6.9	4	6.56	5.3	5.53	4.7	4.69	3.85	5.6	4.3
Cations																				
Calcium (tot)	mg/L	-	-	-	-	0.16	13.1	8.01	6.17	6.38	6.2	7.6	3.47	6.88	3.79	8.2	2.93	2.14	2.8	3.2
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.63	1.07	0.63	0.79	0.81	0.91	1.35	2.92	1.28	2.36	1.13	0.62	0.91	1
Potassium (tot)	mg/L	-	-	-	-	0.2	1.73	<1.15	0.53	<0.5	0.59	0.56	1.11	1.82	1.27	2.05	<1.15	0.81	0.87	0.91
Sodium (tot)	mg/L	-	-	-	-	0.1	1.48	1	0.57	1.21	0.85	1.1	0.97	1.41	1.11	1.57	0.9	0.57	0.81	1.1
Field Parameters																				
pH (Field)	pH units	-	-	-	-		-	-	-	-	5.68	6.79	-	-	-	-	-	-	6.47	6.24
Temperature	deg. C	-	-	-	-		-	-	-	-	7.8	12.1	-	-	-	-	-	-	3.9	6.9
General Chemistry																				
Alkalinity (as CaCO3)	mg/L	Calculated	-	-	-	1	37	20	13	11	27	17	12	16	8	25	7	<5	8.2	8.2
Ammonia as N	mg/L	-	-	-	-	0.02	0.11	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02	<0.02	<0.02	0.1	<0.02	<0.02	<0.05	<0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	4	<2	<2	<2	<2	<2	<5	<2	<2	4	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	31	<5	<5	30	21	11	9	35	<5	277	<5	<5	12	5.2
Electrical Conductivity	uS/cm	-	-	-	-	1	83	56	45	45	45	54	44	46	36	53	34	25	29	34
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	39.4	24.4	18	19.2	21	23	14.2	29.2	14.7	30.2	12	7.9	12	12
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-			-	-	-	-	-	-	-		-	-
pH	pH units	6.5 - 8.5	-	6 - 9	-		6.83	6.66	6.75	6.69	7.18	6.98	6.83	6.48	6.76	6.57	6.37	6.5	6.59	6.66
Phenols	mg/L	0.001	-	0.04	0.004	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	10	76	40	52	56	20	80	30	32	36	38	50	40	40	35
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.62	0.18	0.32	0.36	0.2	0.22	0.31	0.28	0.12	8.04	0.17	0.18	<0.1	0.16
Total Phosphorus	mg/L	0.03	-	-	-	0.02	0.03	<0.02	0.02	<0.02	<0.02	<0.02	0.03	0.12	0.05	0.66	0.08	<0.02	<0.02	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	<10	<10	17	280	<10	190	13	<10	<10	10
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	<0.000002	<0.000002	<0.00061	<0.00061	-	-	-	-	-	<0.000002	<0.00061	<0.00061
Metals																				
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	0.051	0.071	0.079	0.087	0.072	-	-	-	-	0.049	0.062	0.082	0.079
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	0.097	-	-	-	-	-	0.068	0.071	0.062	0.048	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.128	-	0.125	0.167	-	-	0.487	3.67	0.177	1.49	-	0.09	-	-
Barium (tot)	mg/L	-	-	2.3	-	0.002	0.025	0.012	0.013	0.018	0.01	0.012	0.014	0.065	0.011	0.037	0.011	0.011	0.0097	0.012
Beryllium (tot)	mg/L	Calculated	-	-	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (tot)	mg/L	-	-	0.064	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0039	<0.0005	0.0018	<0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	<0.002	0.001	0.001	0.0016	0.0013	0.004	**0.017**	<0.002	**0.009**	<0.002	0.001	0.0016	0.0021
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.98	0.052	0.079	0.136	<0.1	<0.1	0.45	**3.85**	0.134	**1.65**	0.068	0.038	<0.1	0.29
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.003**	<0.001	0.002	<0.001	<0.001	<0.0005	<0.0005
Manganese (tot)	mg/L	-	-	-	-	0.002	0.312	0.006	0.017	0.05	0.0062	0.0034	0.031	0.242	0.007	0.444	0.005	<0.002	0.0064	0.015
Molybdenum (tot)	mg/L	-	0.04	-	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (tot)	mg/L	0.025	-	-	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (tot)	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (tot)	mg/L	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (tot)	mg/L	-	0.0003	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (tot)	mg/L	-	0.006	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.02	<0.02	<0.02	<0.02	<0.005	<0.005	<0.005	0.026	<0.005	0.021	<0.02	<0.02	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Calculated	PWQO values are determined on a sample-specific basis, as the criterion depends on the concentration of another parameter. Calculation procedures follow PWQO guidance tables.

Appendix E

E-3 2025 Surface Water Monitoring Locations Comparisons

E-3: Spring 2025 Surface Water Results Comparison

Sample Description			HR-SW1	HR-SW2	Comparison	HR-SW3	Comparison	HR-SW4	Comparison
Date Sampled			07-May-25	07-May-25	SW1 to SW2	07-May-25	SW1 to SW3	07-May-25	SW4 to SW1
Parameter	Unit	RDL			% change		% change		% change
Biochemical Oxygen Demand, Total	mg/L	2	2	2	0%	2	0%	2	0%
pH	pH Units	NA	7.52	7.17	5%	6.98	7%	6.66	-13%
Alkalinity (as CaCO3)	mg/L	5	49	24	51%	17	65%	8.2	-498%
Electrical Conductivity	uS/cm	2	91	60	34%	54	41%	34	-168%
Hardness (as CaCO3) (Calculated)	mg/L	0.5	41	27	34%	23	44%	12	-242%
Total Dissolved Solids	mg/L	20	100	45	55%	80	20%	35	-186%
Total Suspended Solids	mg/L	10	10	10	0%	10	0%	10	0%
Chloride	mg/L	0.10	1	1	0%	1	0%	1	0%
Nitrate as N	mg/L	0.05	0.32	0.1	69%	0.1	69%	0.1	-220%
Nitrite as N	mg/L	0.05	0.01	0.01	0%	0.01	0%	0.01	0%
Sulphate	mg/L	0.10	5.4	4.1	24%	4	26%	4.3	-26%
Ammonia as N	mg/L	0.02	0.05	0.05	0%	0.05	0%	0.05	0%
Total Kjeldahl Nitrogen	mg/L	0.10	0.12	0.19	-58%	0.22	-83%	0.16	25%
Total Phosphorus	mg/L	0.02	0.02	0.02	0%	0.02	0%	0.02	0%
Chemical Oxygen Demand	mg/L	5	4	7.3	-83%	11	-175%	5.2	23%
Total Calcium	mg/L	0.16	15	8.7	42%	7.6	49%	3.2	-369%
Total Magnesium	mg/L	0.17	1.3	1	23%	0.91	30%	1	-30%
Total Potassium	mg/L	0.58	0.74	0.72	3%	0.56	24%	0.91	19%
Total Sodium	mg/L	0.22	0.93	0.97	-4%	1.1	-18%	1.1	15%
Aluminum-dissolved	mg/L	0.004	0.022	0.05	-127%	0.072	-227%	0.079	72%
Total Barium	mg/L	0.002	0.013	0.013	0%	0.012	8%	0.012	-8%
Total Boron	mg/L	0.010	0.01	0.01	0%	0.01	0%	0.01	0%
Total Cobalt	mg/L	0.0005	0.0005	0.0005	0%	0.0005	0%	0.0005	0%
Total Copper	mg/L	0.002	0.0017	0.0014	18%	0.0013	24%	0.0021	19%
Total Iron	mg/L	0.010	0.1	0.1	0%	0.1	0%	0.29	66%
Total Lead	mg/L	0.001	0.0005	0.0005	0%	0.0005	0%	0.0005	0%
Total Manganese	mg/L	0.002	0.002	0.0021	-5%	0.0034	-70%	0.015	87%
Total Zinc	mg/L	0.005	0.005	0.005	0%	0.005	0%	0.005	0%

- value indicates an increase in downstream concentration
red font indicates < removed

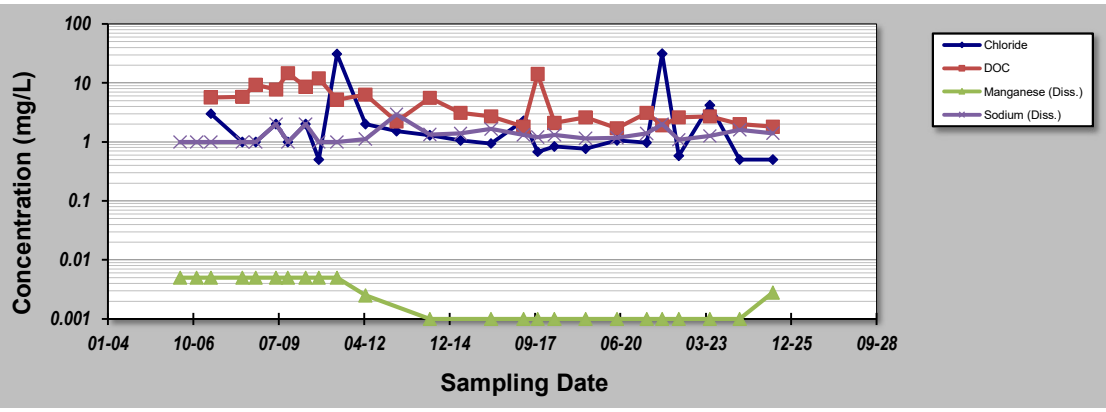
Appendix F

Mann-Kendall Trend Analysis

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR1-03
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR1-03 CONCENTRATION (mg/L)						
1	2006-May-10	-	-	0.005	1			
2	2006-Nov-20	-	-	0.005	1			
3	2007-May-03	3	5.7	0.005	1			
4	2008-May-08	1	5.8	0.005	1			
5	2008-Oct-09	1	9.3	0.005	1			
6	2009-Jun-04	2	7.7	0.005	2			
7	2009-Oct-21	1	14.6	0.005	1			
8	2010-May-18	2	8.6	0.005	2			
9	2010-Oct-19	0.5	11.9	0.005	1			
10	2011-May-19	31	5.2	0.005	1			
11	2012-Apr-16	2	6.3	0.0025	1.12			
12	2013-Apr-16	1.52	2.2	0	2.93			
13	2014-May-12	1.3	5.6	0.001	1.33			
14	2015-May-05	1.06	3.1	0	1.39			
15	2016-Apr-27	0.94	2.7	0.001	1.66			
16	2017-May-12	2.28	1.8	0.001	1.32			
17	2017-Oct-24	0.68	14.1	0.001	1.21			
18	2018-May-09	0.84	2.1	0.001	1.32			
19	2019-May-08	0.77	2.6	0.001	1.15			
20	2020-May-08	1.06	1.7	0.001	1.18			
21	2021-Apr-22	0.97	3.1	0.001	1.39			
22	2021-Oct-21	31.3	1.9	0.001	2.01			
23	2022-May-02	0.58	2.6	0.001	1.09			
24	2023-May-03	4.17	2.7	0.001	1.26			
25	2024-Apr-16	0.5	2	0.001	1.6			
26	2025-May-07	0.5	1.8	0.0028	1.4			
27								
28								
29								
30								
Coefficient of Variation:		2.21	0.76	0.78	0.33			
Mann-Kendall Statistic (S):		-72	-142	-137	108			
Confidence Factor:		96.1%	>99.9%	99.9%	99.2%			
Concentration Trend:		Decreasing	Decreasing	Decreasing	Increasing			



Notes:

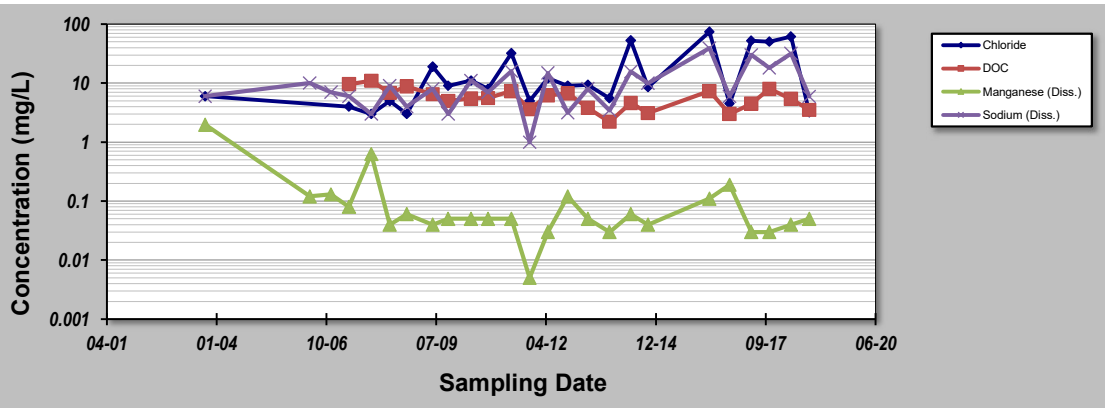
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR2-03
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR2-03 CONCENTRATION (mg/L)						
1	2003-Sep-30	6	-	1.98	6			
2	2006-May-10	-	-	0.12	10			
3	2006-Nov-20	-	-	0.13	7			
4	2007-May-03	4	9.6	0.08	6			
5	2007-Nov-22	3	10.9	0.63	3			
6	2008-May-08	5	6.8	0.04	9			
7	2008-Oct-09	3	8.8	0.06	4			
8	2009-Jun-04	19	6.5	0.04	8			
9	2009-Oct-21	9	5	0.05	3			
10	2010-May-18	11	5.5	0.05	11			
11	2010-Oct-19	8	5.6	0.05	7			
12	2011-May-19	32	7.3	0.05	16			
13	2011-Nov-03	5	3.6	0.005	1			
14	2012-Apr-16	12	6.2	0.03	14.8			
15	2012-Oct-15	9	6.7	0.12	3.15			
16	2013-Apr-16	9.39	3.8	0.05	8.09			
17	2013-Oct-30	5.52	2.2	0.03	3.45			
18	2014-May-12	52.9	4.6	0.06	15.7			
19	2014-Oct-16	8.56	3.1	0.04	9.91			
20	2016-Apr-27	74	7.3	0.11	39			
21	2016-Oct-27	4.48	3	0.19	5.92			
22	2017-May-12	52.3	4.5	0.03	30.2			
23	2017-Oct-24	50.4	8	0.03	18.2			
24	2018-May-09	61.4	5.4	0.04	31.9			
25	2018-Oct-23	3.18	3.5	0.05	5.94			
26								
27								
28								
29								
30								
Coefficient of Variation:		1.14	0.39	2.44	0.87			
Mann-Kendall Statistic (S):		78	-90	-91	81			
Confidence Factor:		98.0%	99.5%	98.3%	97.0%			
Concentration Trend:		Increasing	Decreasing	Decreasing	Increasing			



Notes:

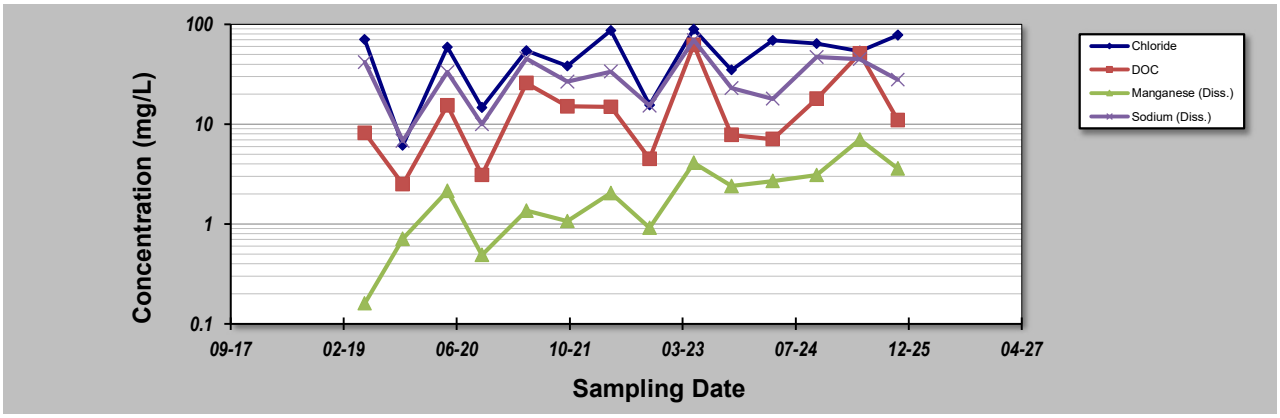
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR2-03R
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR2-03R CONCENTRATION (mg/L)						
1	2019-May-08	70.7	8.2	0.16	42			
2	2019-Oct-23	6.15	2.5	0.71	6.81			
3	2020-May-08	59.1	15.4	2.14	33.3			
4	2020-Oct-08	14.7	3.1	0.49	9.95			
5	2021-Apr-22	54.7	25.8	1.36	45.6			
6	2021-Oct-21	38.3	15.1	1.07	26.6			
7	2022-May-02	86.7	14.9	2.04	33.7			
8	2022-Oct-20	15.6	4.5	0.918	15.3			
9	2023-May-03	89.7	62.5	4.11	69.9			
10	2023-Oct-17	35	7.8	2.4	23			
11	2024-Apr-16	69	7.1	2.7	18			
12	2024-Oct-28	64	18	3.1	47			
13	2025-May-07	54	51	7	45			
14	2025-Oct-22	78	11	3.6	28			
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.58	1.14	1.08	0.60			
Mann-Kendall Statistic (S):		-15	-22	-6	-17			
Confidence Factor:		68.6%	76.6%	56.9%	71.0%			
Concentration Trend:		Stable	No Trend	No Trend	Stable			



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

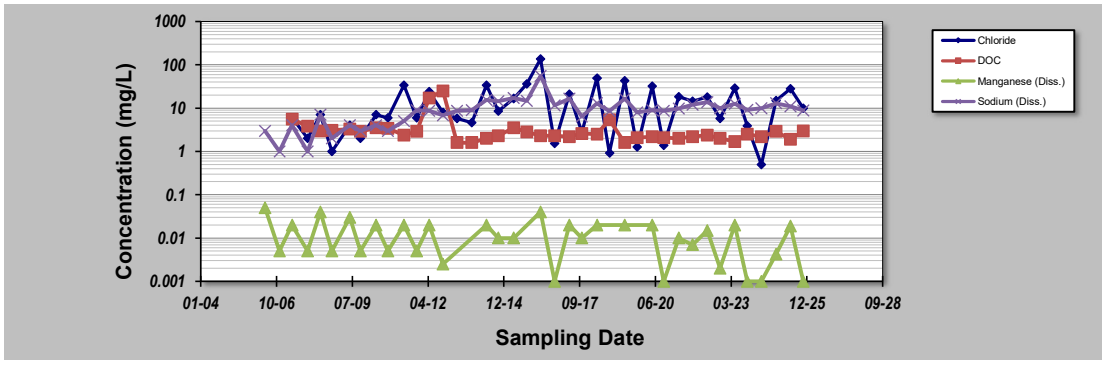
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI Environmental Inc., www.gsi-net.com

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR3-03
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR3-03 CONCENTRATION (mg/L)						
1	2006-May-10	-	-	0.05	3			
2	2006-Nov-20	-	-	0.005	1			
3	2007-May-03	6	5.6	0.02	4			
4	2007-Nov-22	2	3.8	0.005	1			
5	2008-May-08	7	3	0.04	7			
6	2008-Oct-09	1	3.1	0.005	2			
7	2009-Jun-04	4	3.3	0.03	4			
8	2009-Oct-21	2	2.9	0.005	3			
9	2010-May-18	7	3.5	0.02	4			
10	2010-Oct-19	6	3.4	0.005	3			
11	2011-May-19	34	2.4	0.02	5			
12	2011-Nov-03	6	2.9	0.005	9			
13	2012-Apr-16	24	17	0.02	8.72			
14	2012-Oct-15	8	25	0.0025	6.89			
15	2013-Apr-16	5.79	1.6	0	8.66			
16	2013-Oct-30	4.64	1.6	0	8.95			
17	2014-May-12	34	2	0.02	15.6			
18	2014-Oct-16	8.56	2.3	0.01	14.4			
19	2015-May-05	16.8	3.5	0.01	17.1			
20	2015-Oct-27	36.1	2.8	0	14.7			
21	2016-Apr-27	137	2.3	0.04	55.9			
22	2016-Oct-27	1.52	2.3	0.001	11.5			
23	2017-May-12	21.1	2.2	0.02	16.6			
24	2017-Oct-24	2.77	2.6	0.01	6.42			
25	2018-May-09	49.2	2.5	0.02	13			
26	2018-Oct-23	0.92	5.4	0	8.59			
27	2019-May-08	43.3	1.6	0.02	16.6			
28	2019-Oct-23	1.26	2.1	0	8			
29	2020-May-08	32	2.2	0.02	8.98			
30	2020-Oct-08	1.38	2.1	0.001	8.71			
31	2021-Apr-22	18.3	2	0.01	9.74			
32	2021-Oct-21	14.5	2.2	0.007	12.1			
33	2022-May-02	18.2	2.4	0.015	13.7			
34	2022-Oct-20	5.75	2	0.002	10			
35	2023-May-03	29.3	1.7	0.02	12.6			
36	2023-Oct-17	3.9	2.5	0.001	9.2			
37	2024-Apr-16	0.5	2.2	0.001	10			
38	2024-Oct-28	15	2.9	0.0042	13			
39	2025-May-07	28	1.9	0.019	11			
40	2025-Oct-22	10	3	0.001	8.9			
Coefficient of Variation:		1.41	1.20	1.02	0.85			
Mann-Kendall Statistic (S):		71	-242	-153	340			
Confidence Factor:		80.9%	99.9%	96.2%	>99.9%			
Concentration Trend:		No Trend	Decreasing	Decreasing	Increasing			



Notes:

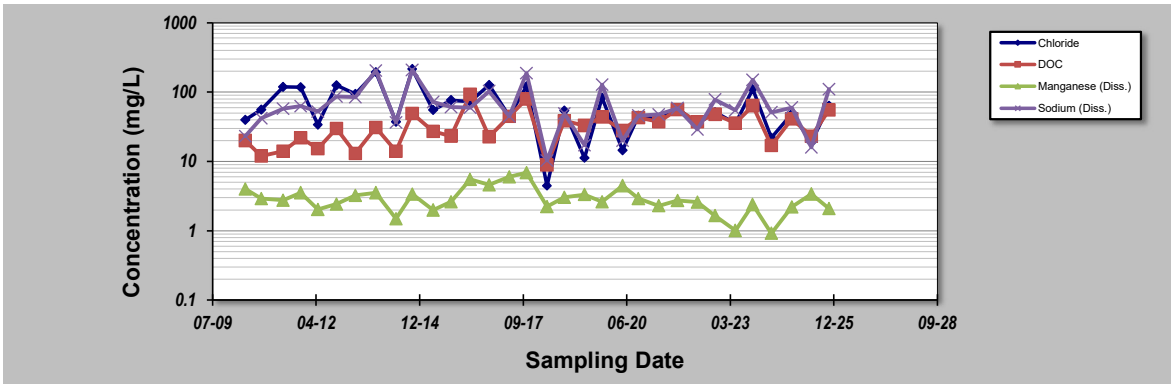
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR4-10
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR4-10 CONCENTRATION (mg/L)						
1	2010-May-18	40	20.1	3.99	23			
2	2010-Oct-19	56	11.9	2.91	42			
3	2011-May-19	119	14	2.75	58			
4	2011-Nov-03	117	22	3.55	63			
5	2012-Apr-16	34	15.2	2.03	52.5			
6	2012-Oct-15	125	30	2.42	87.1			
7	2013-Apr-16	94.2	13.1	3.23	85			
8	2013-Oct-30	194	30.8	3.54	204			
9	2014-May-12	37.2	14	1.49	36.5			
10	2014-Oct-16	214	49.1	3.38	209			
11	2015-May-05	55.1	27.1	2	71.7			
12	2015-Oct-27	76.5	23.3	2.63	60.6			
13	2016-Apr-27	72.8	93.2	5.52	59.6			
14	2016-Oct-27	127	22.8	4.61	103			
15	2017-May-12	44.8	44.7	6.02	44.9			
16	2017-Oct-24	122	79.6	6.91	188			
17	2018-May-09	4.46	8.9	2.24	10.3			
18	2018-Oct-23	54	38.5	3.03	49.3			
19	2019-May-08	11.3	33	3.33	17.2			
20	2019-Oct-23	83.5	43.6	2.63	128			
21	2020-May-08	14.5	27.8	4.46	20			
22	2020-Oct-08	46	42.8	2.92	45.9			
23	2021-Apr-22	40.5	37.5	2.3	47.4			
24	2021-Oct-21	58.1	55.7	2.73	58.8			
25	2022-May-02	35	37.3	2.58	29			
26	2022-Oct-20	51.2	47.8	1.65	78.2			
27	2023-May-03	35.4	35.6	1.01	54.8			
28	2023-Oct-17	110	64	2.4	150			
29	2024-Apr-16	22	17	0.92	51			
30	2024-Oct-28	49	41	2.2	60			
31	2025-May-07	19	23	3.4	16			
32	2025-Oct-22	64	55	2.1	110			
33								
34								
35								
Coefficient of Variation:		0.72	0.56	0.44	0.73			
Mann-Kendall Statistic (S):		-120	169	-121	-12			
Confidence Factor:		97.3%	99.7%	97.4%	57.0%			
Concentration Trend:		Decreasing	Increasing	Decreasing	Stable			



Notes:

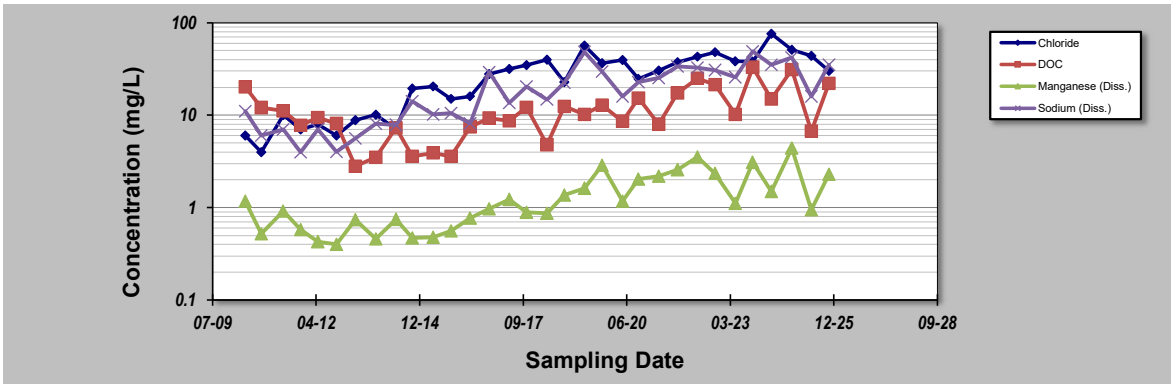
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR5-10
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR5-10 CONCENTRATION (mg/L)						
1	2010-May-18	6	20.3	1.18	11			
2	2010-Oct-19	4	12.1	0.52	6			
3	2011-May-19	10	11.1	0.92	7			
4	2011-Nov-03	7	7.8	0.58	4			
5	2012-Apr-16	8	9.4	0.43	7.04			
6	2012-Oct-15	6	8.1	0.4	4.03			
7	2013-Apr-16	8.85	2.8	0.74	5.63			
8	2013-Oct-30	10.1	3.5	0.46	8.07			
9	2014-May-12	7.09	7.3	0.75	7.85			
10	2014-Oct-16	19.4	3.6	0.47	14.1			
11	2015-May-05	20.5	3.9	0.48	10.2			
12	2015-Oct-27	15	3.6	0.56	10.5			
13	2016-Apr-27	16	7.5	0.77	8.16			
14	2016-Oct-27	27.8	9.3	0.97	29.1			
15	2017-May-12	31.5	8.7	1.23	13.6			
16	2017-Oct-24	34.9	12.2	0.89	20.4			
17	2018-May-09	39.8	4.8	0.87	14.8			
18	2018-Oct-23	22.8	12.4	1.37	22.4			
19	2019-May-08	56.6	10.2	1.62	48.4			
20	2019-Oct-23	36.5	12.8	2.87	29.6			
21	2020-May-08	39.6	8.6	1.18	16			
22	2020-Oct-08	24.8	15.3	2.03	22.7			
23	2021-Apr-22	30.4	8	2.19	25.3			
24	2021-Oct-21	37.5	17.4	2.58	33.7			
25	2022-May-02	42.9	25	3.53	32.7			
26	2022-Oct-20	48	21.4	2.34	30.7			
27	2023-May-03	38.3	10.2	1.11	25.8			
28	2023-Oct-17	38	33	3.1	49			
29	2024-Apr-16	76	15	1.5	35			
30	2024-Oct-28	51	31	4.4	42			
31	2025-May-07	44	6.7	0.95	16			
32	2025-Oct-22	30	22	2.3	35			
33								
34								
35								
Coefficient of Variation:		0.63	0.64	0.72	0.65			
Mann-Kendall Statistic (S):		349	180	289	342			
Confidence Factor:		>99.9%	99.8%	>99.9%	>99.9%			
Concentration Trend:		Increasing	Increasing	Increasing	Increasing			



Notes:

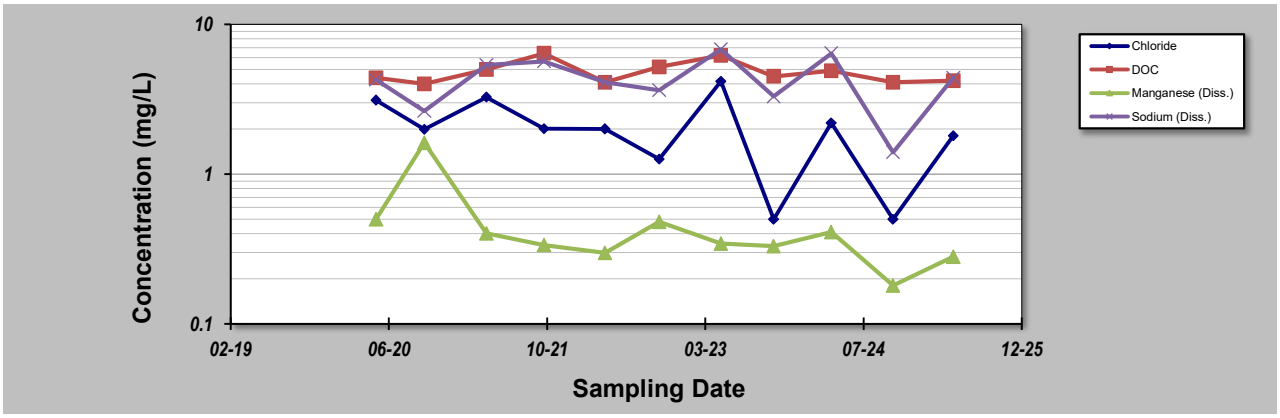
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR6-19
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR6-19 CONCENTRATION (mg/L)						
1	2020-May-08	3.12	4.4	0.5	4.27			
2	2020-Oct-08	1.99	4	1.62	2.64			
3	2021-Apr-22	3.27	5	0.402	5.35			
4	2021-Oct-21	2.01	6.4	0.336	5.66			
5	2022-May-02	2	4.1	0.298	4.1			
6	2022-Oct-20	1.26	5.2	0.48	3.64			
7	2023-May-03	4.16	6.2	0.343	6.83			
8	2023-Oct-17	0.5	4.5	0.33	3.3			
9	2024-Apr-16	2.2	4.9	0.41	6.4			
10	2024-Oct-28	0.5	4.1	0.18	1.4			
11	2025-May-07	1.8	4.2	0.28	4.4			
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.54	0.17	0.83	0.37			
Mann-Kendall Statistic (S):		-18	-2	-29	-1			
Confidence Factor:		90.5%	53.0%	98.7%	50.0%			
Concentration Trend:		Prob. Decreasing	Stable	Decreasing	Stable			



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

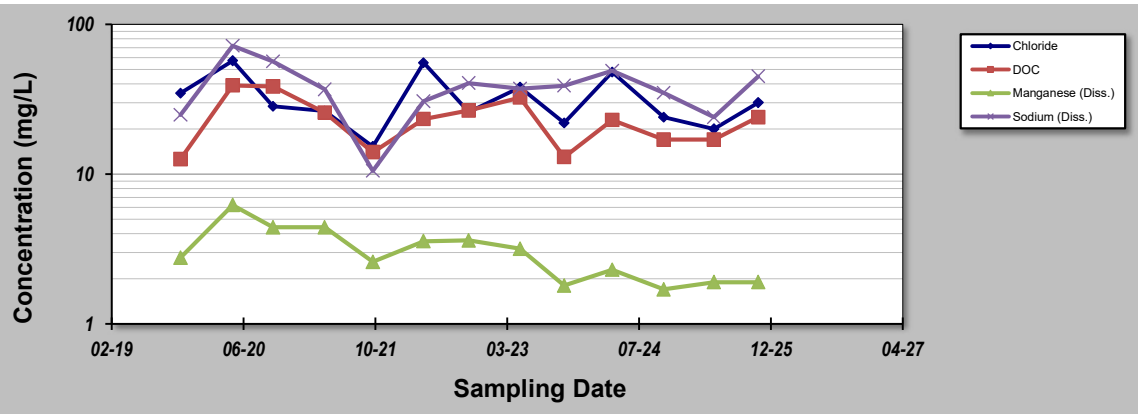
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI Environmental Inc., www.gsi-net.com

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR7-19
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR7-19 CONCENTRATION (mg/L)						
1	2019-Oct-23	34.7	12.6	2.76	24.9			
2	2020-May-08	57.1	39.1	6.21	72.1			
3	2020-Oct-08	28.4	38.5	4.41	56.6			
4	2021-Apr-22	26.3	25.8	4.41	36.9			
5	2021-Oct-21	15.3	14	2.59	10.5			
6	2022-May-02	55.5	23.3	3.56	30.6			
7	2022-Oct-20	26	26.6	3.6	40.6			
8	2023-May-03	38.1	32.4	3.17	37.2			
9	2023-Oct-17	22	13	1.8	39			
10	2024-Apr-16	48	23	2.3	49			
11	2024-Oct-28	24	17	1.7	35			
12	2025-May-07	20	17	1.9	24			
13	2025-Oct-22	30	24	1.9	45			
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.41	0.38	0.43	0.40			
Mann-Kendall Statistic (S):		-20	-13	-46	-2			
Confidence Factor:		87.4%	76.4%	99.8%	52.4%			
Concentration Trend:		Stable	Stable	Decreasing	Stable			



Notes:

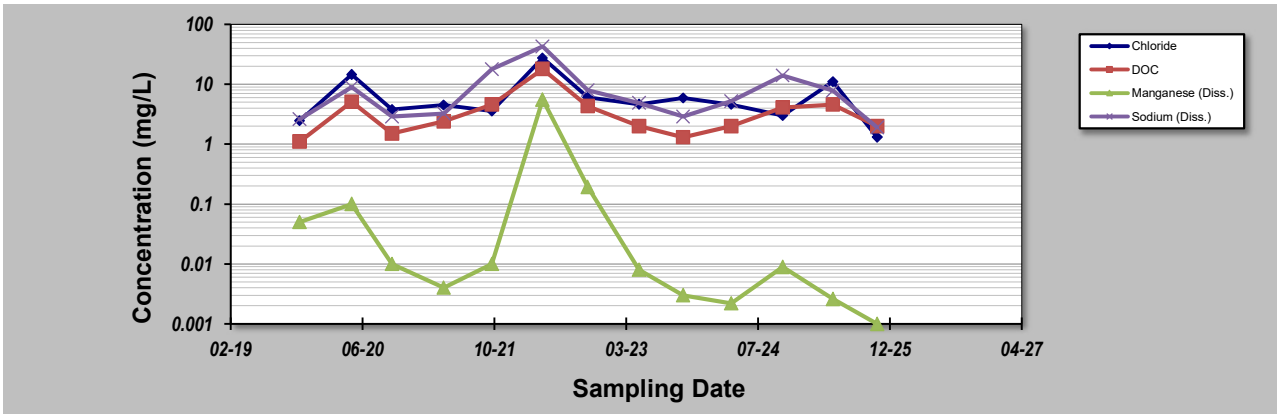
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR8-19
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR8-19 CONCENTRATION (mg/L)						
1	2019-Oct-23	2.44	1.1	0.05	2.61			
2	2020-May-08	14.5	5.1	0.1	8.98			
3	2020-Oct-08	3.78	1.5	0.01	2.9			
4	2021-Apr-22	4.53	2.4	0.004	3.25			
5	2021-Oct-21	3.56	4.6	0.01	17.9			
6	2022-May-02	27.4	18	5.53	42.9			
7	2022-Oct-20	6.05	4.3	0.193	7.98			
8	2023-May-03	4.64	2	0.008	4.88			
9	2023-Oct-17	5.9	1.3	0.003	2.9			
10	2024-Apr-16	4.6	2	0.0022	5.2			
11	2024-Oct-28	3	4.1	0.0089	14			
12	2025-May-07	11	4.6	0.0026	7.8			
13	2025-Oct-22	1.3	2	0.001	1.9			
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.99	1.08	3.35	1.17			
Mann-Kendall Statistic (S):		-4	2	-41	1			
Confidence Factor:		57.1%	52.4%	99.4%	50.0%			
Concentration Trend:		Stable	No Trend	Decreasing	No Trend			



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

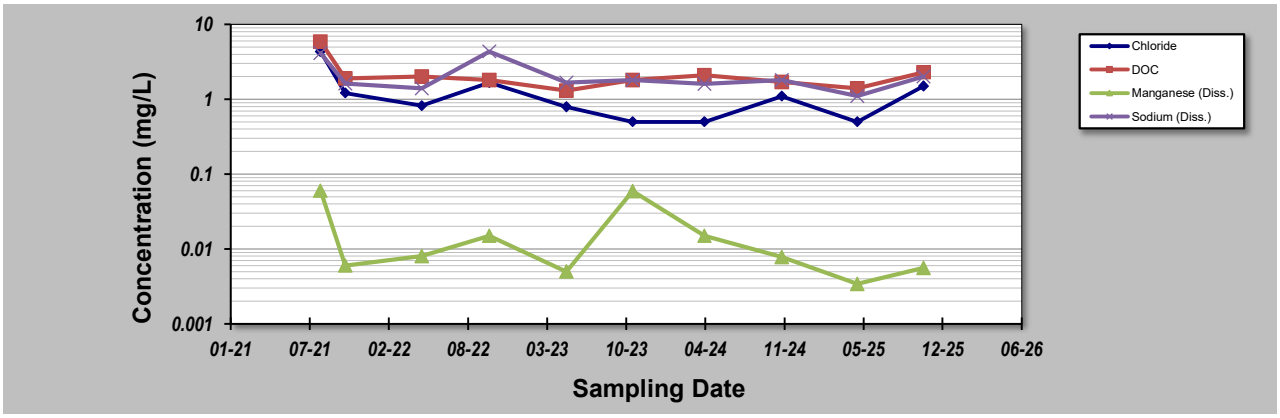
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI Environmental Inc., www.gsi-net.com

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR9-21
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR9-21 CONCENTRATION (mg/L)						
1	2021-Aug-19	4.33	5.9	0.06	4.12			
2	2021-Oct-21	1.21	1.9	0.006	1.62			
3	2022-May-02	0.82	2	0.008	1.4			
4	2022-Oct-20	1.67	1.8	0.015	4.34			
5	2023-May-03	0.79	1.3	0.005	1.67			
6	2023-Oct-17	0.5	1.8	0.059	1.8			
7	2024-Apr-16	0.5	2.1	0.015	1.6			
8	2024-Oct-28	1.1	1.7	0.0078	1.8			
9	2025-May-07	0.5	1.4	0.0034	1.1			
10	2025-Oct-22	1.5	2.3	0.0056	2			
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.89	0.60	1.19	0.53			
Mann-Kendall Statistic (S):		-16	-10	-16	-4			
Confidence Factor:		90.7%	78.4%	90.7%	60.3%			
Concentration Trend:		Prob. Decreasing	Stable	Prob. Decreasing	Stable			



Notes:

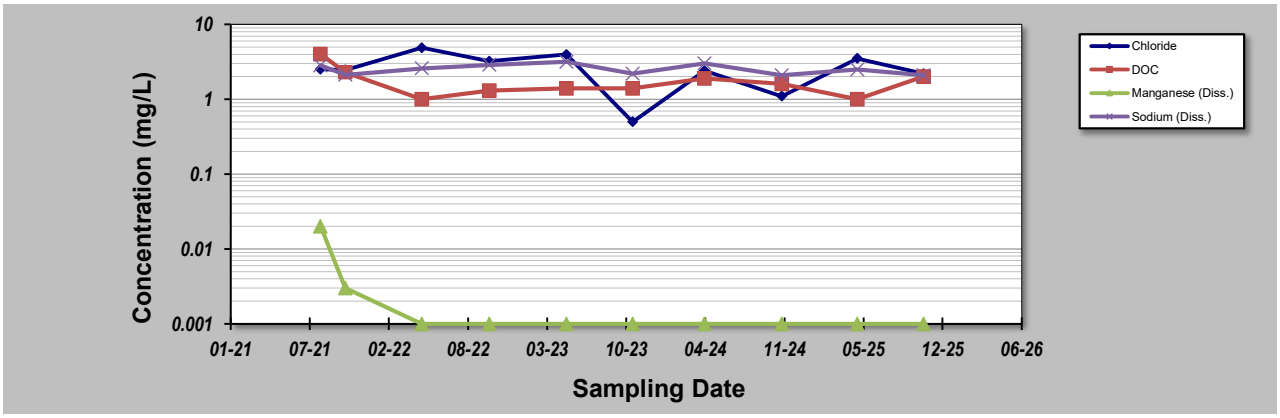
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR10-21
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Chloride	DOC	Manganese (Diss.)	Sodium (Diss.)			
Sampling Event	Sampling Date	HR10-21 CONCENTRATION (mg/L)						
1	2021-Aug-19	2.52	4	0.02	2.84			
2	2021-Oct-21	2.46	2.3	0.003	2.13			
3	2022-May-02	4.87	1	0.001	2.59			
4	2022-Oct-20	3.23	1.3	0.001	2.88			
5	2023-May-03	3.95	1.4	0.001	3.16			
6	2023-Oct-17	0.5	1.4	0.001	2.2			
7	2024-Apr-16	2.4	1.9	0.001	3			
8	2024-Oct-28	1.1	1.6	0.001	2.1			
9	2025-May-07	3.5	1	0.001	2.5			
10	2025-Oct-22	2.2	2	0.001	2.1			
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.48	0.49	1.93	0.16			
Mann-Kendall Statistic (S):		-11	-3	-17	-10			
Confidence Factor:		81.0%	56.9%	92.2%	78.4%			
Concentration Trend:		Stable	Stable	Prob. Decreasing	Stable			



Notes:

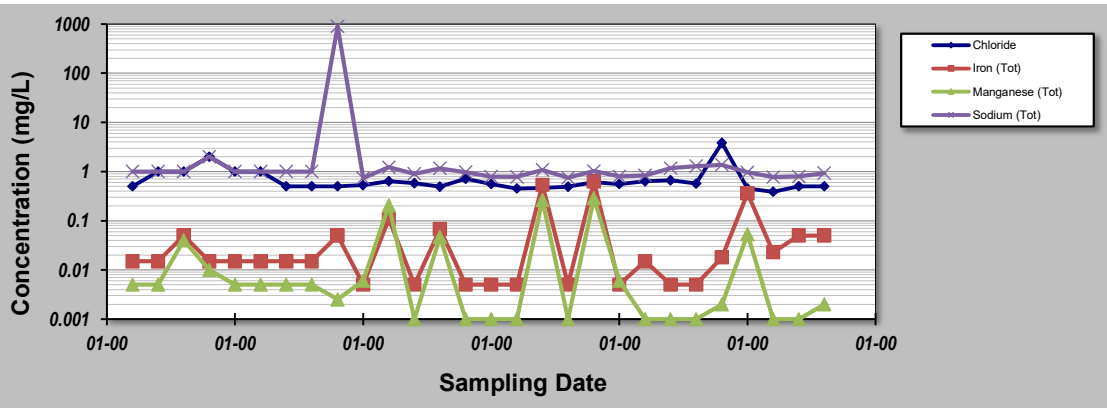
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR-SW1
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Aluminum (Tot)	Chloride	Iron (Tot)	Manganese (Tot)	Sodium (Tot)		
Sampling Event	Sampling Date	HR-SW1 CONCENTRATION (mg/L)						
1	2007-May-03	-	0.5	0.015	0.005	1		
2	2008-May-08	-	1	0.015	0.005	1		
3	2008-Oct-09	-	1	0.05	0.04	1		
4	2009-Jun-04	-	2	0.015	0.01	2		
5	2009-Oct-21	-	1	0.015	0.005	1		
6	2010-May-18	-	1	0.015	0.005	1		
7	2010-Oct-19	-	0.5	0.015	0.005	1		
8	2011-May-19	-	0.5	0.015	0.005	1		
9	2012-Apr-16	-	0.5	0.05	0.0025	903		
10	2013-Apr-16	-	0.53	0.005	0.006	0.74		
11	2013-Oct-30	-	0.64	0.11	0.206	1.22		
12	2014-May-12	-	0.58	0.005	0.001	0.9		
13	2014-Oct-16	-	0.49	0.068	0.047	1.16		
14	2015-May-05	-	0.72	0.005	0.001	0.97		
15	2016-Apr-27	-	0.56	0.005	0.001	0.79		
16	2017-May-12	-	0.45	0.005	0.001	0.78		
17	2017-Oct-24	-	0.46	0.54	0.265	1.08		
18	2018-May-09	-	0.49	0.005	0.001	0.75		
19	2018-Oct-23	-	0.61	0.63	0.288	1.02		
20	2019-May-08	-	0.56	0.005	0.006	0.8		
21	2020-May-08	0.046	0.63	0.015	0.001	0.84		
22	2020-Oct-08	0.035	0.67	0.005	0.001	1.18		
23	2021-Apr-22	0.028	0.57	0.005	0.001	1.29		
24	2021-Oct-21	0.057	3.83	0.018	0.002	1.38		
25	2022-May-02	-	0.45	0.362	0.053	0.96		
26	2023-May-03	0.07	0.39	0.023	0.001	0.77		
27	2024-Apr-16	-	0.5	0.05	0.001	0.8		
28	2025-May-07	-	0.5	0.05	0.002	0.93		
29								
30								
Coefficient of Variation:		0.36	0.88	2.11	2.29	5.13		
Mann-Kendall Statistic (S):		4	-90	24	-82	-56		
Confidence Factor:		75.8%	96.1%	67.4%	94.5%	86.0%		
Concentration Trend:		No Trend	Decreasing	No Trend	Prob. Decreasing	No Trend		



Notes:

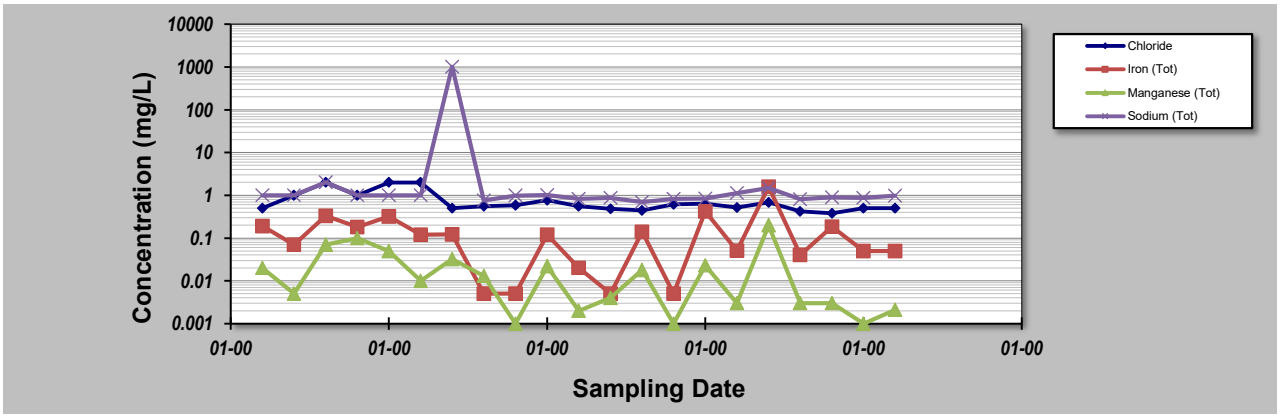
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR-SW2
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Aluminum (Tot)	Chloride	Iron (Tot)	Manganese (Tot)	Sodium (Tot)		
Sampling Event	Sampling Date	HR-SW2 CONCENTRATION (mg/L)						
1	2007-May-03	-	0.5	0.19	0.02	1		
2	2008-May-08	-	1	0.07	0.005	1		
3	2009-Jun-04	-	2	0.33	0.07	2		
4	2010-May-18	-	1	0.18	0.1	1		
5	2010-Oct-19	-	2	0.32	0.05	1		
6	2011-May-19	-	2	0.12	0.01	1		
7	2012-Apr-16	-	0.5	0.121	0.032	1020		
8	2013-Apr-16	-	0.56	0.005	0.013	0.76		
9	2014-May-12	-	0.59	0.005	0.001	0.99		
10	2015-May-05	-	0.77	0.12	0.022	1.01		
11	2016-Apr-27	-	0.55	0.02	0.002	0.82		
12	2017-May-12	-	0.48	0.005	0.004	0.87		
13	2018-May-09	-	0.44	0.14	0.018	0.7		
14	2019-May-08	-	0.62	0.005	0.001	0.82		
15	2020-May-08	0.472	0.63	0.419	0.023	0.84		
16	2021-Apr-22	0.066	0.52	0.051	0.003	1.13		
17	2021-Oct-21	1.01	0.68	1.59	0.199	1.49		
18	2022-May-02	-	0.42	0.04	0.003	0.81		
19	2023-May-03	0.041	0.38	0.186	0.003	0.89		
20	2024-Apr-16	-	0.5	0.05	0.001	0.87		
21	2025-May-07	-	0.5	0.05	0.0021	0.97		
22								
23								
24								
25								
Coefficient of Variation:		1.14	0.67	1.78	1.69	4.49		
Mann-Kendall Statistic (S):		-2	-84	-28	-72	-46		
Confidence Factor:		62.5%	99.5%	79.0%	98.5%	91.2%		
Concentration Trend:		No Trend	Decreasing	No Trend	Decreasing	Prob. Decreasing		



Notes:

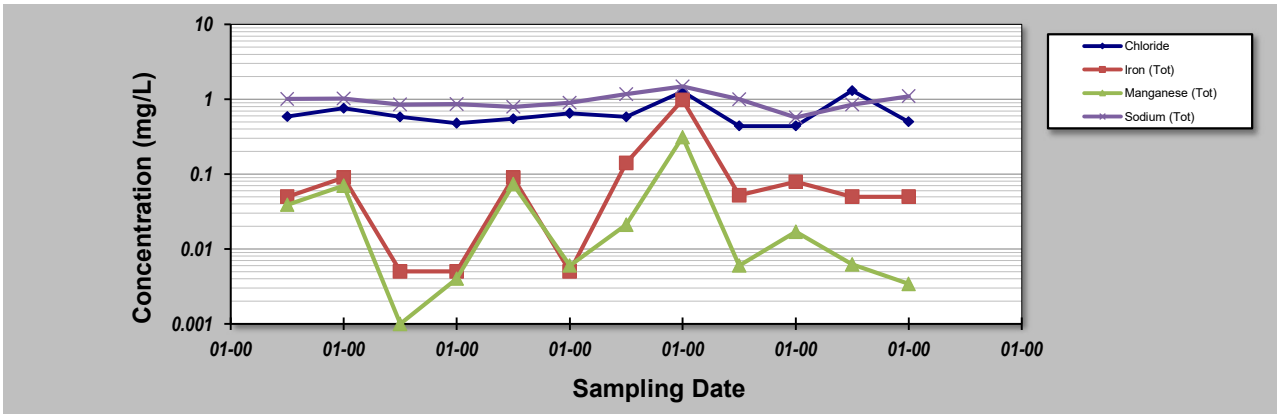
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR-SW3
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Aluminum (Tot)	Chloride	Iron (Tot)	Manganese (Tot)	Sodium (Tot)		
Sampling Event	Sampling Date	HR-SW3 CONCENTRATION (mg/L)						
1	2014-May-12	-	0.59	0.05	0.039	1.01		
2	2015-May-05	-	0.76	0.09	0.07	1.02		
3	2016-Apr-27	-	0.58	0.005	0.001	0.85		
4	2017-May-12	-	0.48	0.005	0.004	0.86		
5	2018-May-09	-	0.55	0.09	0.073	0.79		
6	2019-May-08	-	0.65	0.005	0.006	0.9		
7	2021-Apr-22	0.11	0.58	0.141	0.021	1.17		
8	2021-Oct-21	0.128	1.27	0.98	0.312	1.48		
9	2022-May-02	-	0.44	0.052	0.006	1		
10	2023-May-03	0.125	0.44	0.079	0.017	0.57		
11	2024-Apr-16	-	1.3	0.05	0.0062	0.85		
12	2025-May-07	-	0.5	0.05	0.0034	1.1		
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.08	0.44	2.03	1.88	0.23		
Mann-Kendall Statistic (S):		1	-8	5	-7	1		
Confidence Factor:			68.1%	60.6%	65.6%	50.0%		
Concentration Trend:			Stable	No Trend	No Trend	No Trend		



Notes:

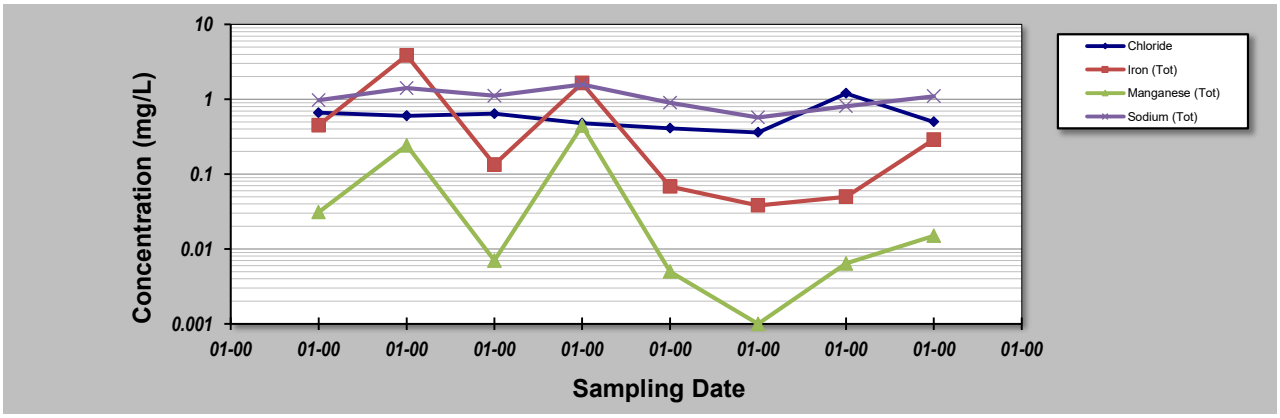
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	March 10 2025	Job ID:	250253-05
Facility Name:	Hickey Road WDS	Constituent:	HR-SW4
Conducted By:	Lhamilton	Concentration Units:	mg/L

Sampling Point ID:	Aluminum (Tot)	Chloride	Iron (Tot)	Manganese (Tot)	Sodium (Tot)		
Sampling Event	Sampling Date	HR-SW4 CONCENTRATION (mg/L)						
1	2020-May-08	0.487	0.66	0.45	0.031	0.97		
2	2020-Oct-08	3.67	0.6	3.85	0.242	1.41		
3	2021-Apr-22	0.177	0.64	0.134	0.007	1.11		
4	2021-Nov-15	1.49	0.48	1.65	0.444	1.57		
5	2022-May-02	-	0.41	0.068	0.005	0.9		
6	2023-May-03	0.09	0.36	0.038	0.001	0.57		
7	2024-Apr-16	-	1.2	0.05	0.0064	0.81		
8	2025-May-07	-	0.5	0.29	0.015	1.1		
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		1.27	0.43	1.64	1.74	0.30		
Mann-Kendall Statistic (S):		-4	-8	-12	-8	-8		
Confidence Factor:		75.8%	80.1%	91.1%	80.1%	80.1%		
Concentration Trend:		No Trend	Stable	Prob. Decreasing	No Trend	Stable		



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

Appendix G

Trigger Mechanisms and Contingency Plan

Appendix G

G-1 Surface Water Trigger Mechanisms and Contingency Plan

HICKEY ROAD WASTE DISPOSAL SITE
SURFACE WATER TRIGGER MECHANISMS AND CONTINGENCY PLAN
11-SEPTEMBER-2024
FINAL, VERSION 2.0

OBJECTIVE AND BACKGROUND

The objective of the trigger mechanisms and contingency plan for the Hickey Road Waste Disposal Site (WDS) is to identify the off-site migration of leachate impacted surface water and groundwater, and ensure timely action to prevent and mitigate any adverse impacts to the environment.

OBJECTIVE 1: SURFACE WATER IMPACTS

To identify migration of impacted surface water or leachate impacted groundwater discharging to adjacent surface water bodies; to identify surface water run-off impacts to surface water bodies; and ensure timely action to prevent and mitigate any adverse impacts to the environment.

South Property Boundary-Surface Water

Assessment Points- SW2, SW3
Trigger Mechanisms- Alkalinity, Chloride, Iron, Manganese, TKN and Un-ionized Ammonia
Frequency-Sampling twice per year (Spring and Fall)

Contingency Plan is activated if three or more of the following triggers occur at the assessment point during one sampling event: Alkalinity, Chloride, Iron, Manganese, TKN, and un-ionized ammonia exceeds the values in Table 1. The 75th percentile for SW1 (background) sampling location based on the sampling results from May 2007 to May 2019 (20 results).

Table 1: SW2 and SW3 Trigger Values for Select Parameters

Parameter	SW1 75th Percentile Concentration mg/L	Surface Water Criteria (PWQO/CWQG) mg/L
Alkalinity	54.5	
Chloride	1.0	
Iron		0.3
Manganese	0.0175	

Parameter	SW1 75th Percentile Concentration mg/L	Surface Water Criteria (PWQO/CWQG) mg/L
TKN	0.36	
Unionized Ammonia		0.02

Notes: Should Tier 1 sampling be triggered based on surface water sampling results the contingency sampling will be carried out at the location having results that triggered the Tier 1 sampling.

Surface water samples are quite frequently dry, should dry conditions be encountered during Tier 1 or Tier 2 sampling events, then follow-up sampling will be carried out during the next semi-annual sampling event should water be present.

CONTINGENCY PLAN – SURFACE WATER

Tier 1: If three or more triggers are exceeded at the SW2 or SW3 surface water assessment point during one sampling event; the following Tier 1 sampling will be undertaken:

- Within two weeks of receipt of laboratory results, a Toxicity test (Single Concentration – Acute Lethality) sample will be collected from SW2 or SW3 (as per notes above) to determine the impacts to surface water. Tier 2 Contingency Plan is activated if result of the Toxicity test is greater than 50%.

Tier 2: Within one week of receipt of laboratory results indicting a failed toxicity test the following will be undertaken:

- A second Toxicity test will be collected at the sample location having failed Toxicity test results. Upon receipt of a confirmed second Toxicity test result the following will be undertaken:
- Identification of other potential causes of elevated concentrations through additional studies to be completed within two months of the second failed test. Following the two months, if no other potential causes for the elevated concentrations have been identified then proceed to Tier 3.

Tier 3: If the increased sampling and/or additional studies indicate a continuing issue resulting in impacts or potential significant impacts to the environment, then mitigation/ remediation measures will be implemented to prevent further impact. These measures would be aimed at intercepting or diverting the impacted surface water/groundwater before it reaches a receptor. The specifics of the plan will be dependent on the nature of the impact.

References:

1. Environment Canada, "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout", Environmental Technology Centre, Ottawa, Ontario, Report EPS 1/RM/13 Second Edition – December 2000, including May 2007 and February 2016 Amendments.
2. Environment Canada, "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia mangna", Environmental Technology Centre, Ottawa, Ontario, Report EPS 1/RM/14 Second Edition – December 2000, including February 2016 Amendment.

Version	Date	Description of Changes	Version Prepared By
1.0	20 November 2020	Finalized draft plan following MECP review.	Iris O'Connor
2.0	11 September 2024	Removed sodium as an assessment parameter. This was an error as sodium was only an assessment parameter for monitoring well HR7-19 in the March 24, 2020, DRAFT document (combined groundwater and surface water plan).	Carolyn Miller

Appendix G

G-2 Groundwater Trigger Mechanisms and Contingency Plan

HICKEY ROAD WASTE DISPOSAL SITE
GROUNDWATER TRIGGER MECHANISMS AND CONTINGENCY PLAN
11-SEPTEMBER-2024
FINAL, VERSION 1.0

OBJECTIVE AND BACKGROUND

The objective of the trigger mechanisms and contingency plan for the Hickey Road Waste Disposal Site (WDS) is to identify the off-site migration of leachate impacted groundwater and ensure timely action to prevent and mitigate any adverse impacts to the environment.

OBJECTIVE 2: GROUNDWATER IMPACTS

To identify migration of leachate impacted groundwater and to ensure timely action to prevent any adverse impacts to the environment.

West and South CAZ Boundary-Groundwater

Assessment Points- HR9-21 (south CAZ boundary) and HR10-21 (west CAZ Boundary)
Trigger Mechanisms- Barium, Chloride, Iron and TDS
Frequency-Sampling twice per year (Spring and Fall)

Contingency Plan is activated if three or more of the following triggers occur for two consecutive sampling events: Barium, Chloride, Iron, and TDS exceed the RUV criteria for the assessment point.

Table 1: Trigger Values for Select Parameters

Parameter	RUV mg/L
Barium	0.303
Chloride	129
Iron	0.25
TDS	314

CONTINGENCY PLAN – GROUNDWATER

Tier 1: If three or more triggers are exceeded at one assessment point for two consecutive sampling events, a repeat sampling will be conducted within one (1) month of receipt of the laboratory results to confirm or refute the results at that location.

Tier 2: If three or more triggers are exceeded at one assessment point and are confirmed through Tier 1 additional sampling then the following measures will be implemented depending on the nature of the trigger activation:

a. Increase monitoring frequency to twice monthly, for four months (if exceedances continue). Revert back to typical annual monitoring sampling frequency if there are two consecutive sampling results that do not show exceedances; and/or
b. Identification of other potential causes for elevated concentrations through additional studies.

Tier 3: If the increased sampling indicates a continuing issue resulting in impacts or potential significant impacts to the environment, then mitigation/remediation measures will be implemented to prevent further impact. These measures would be aimed at intercepting or diverting the impacted groundwater before it reaches a receptor. The specifics of the plan will be dependent on the nature of the impact.

Version	Date	Description of Changes	Version Prepared By
1.0	11 September 2024	Revised assessment points from "future west and south CAZ boundaries" to "HR9-21 (south CAZ boundary) and HR10-21 (west CAZ boundary)", as these assessment points did not exist when the draft plan was prepared in March 2021. Finalized draft plan.	Carolyn Miller



1682 Woodward Dr.
Ottawa, ON K2C 3R8
Canada

T 877.487.8436
Ottawa@blumetric.ca

The Tower, 4 Cataraqui St.
Kingston, ON K7K 1Z7
Canada

T 877.487.8436
Kingston@blumetric.ca

3B-209 Frederick St.
Kitchener, ON N2H 2M7
Canada

T 877.487.8436
Kitchener@blumetric.ca

825 Milner Ave.
Toronto, ON M1B 3C3
Canada

T 877.487.8436
Toronto@blumetric.ca

6-410 Falconbridge Rd.
Sudbury, ON P3A 4S4
Canada

T 877.487.8436
Sudbury@blumetric.ca

260-15 Taschereau St.
Gatineau, QC J8Y 2V6
Canada

T 877.487.8436
Gatineau@blumetric.ca

200-1500 Du College St.
Saint-Laurent, QC H4L 5G6
Canada

T 877.487.8436
Montreal@blumetric.ca

27 Parker St.
Dartmouth, NS B2Y 4T5
Canada

T 877.487.8436
Dartmouth@blumetric.ca

4916 49th St.
Yellowknife, NT X1A 1P3
Canada

T 877.487.8436
Yellowknife@blumetric.ca

3545 SW 47th Ave. Suite B
Gainesville, FL 32608
USA

T 877.487.8436
Gainesville@blumetric.ca