2025 Annual Monitoring Report
Musclow-Greenview WDS
Environmental Compliance Approval No. A362303

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: 250523-07
March 25, 2026

BluMetric.ca

Table of Contents

1 Introduction 1

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

2 Physical Setting 3

2.1 Geology and Potential Receptors 3
2.1.1 Surficial Geology 3
2.1.2 Bedrock Geology 3
2.2 MECP Well Records 4
2.3 Surface Water Features 4

3 Description of Monitoring Program 4

3.1 Site Inspections and Operations Monitoring 4
3.2 Monitoring Locations, Frequency, and Monitoring Parameters 5
3.2.1 Drive-Point Piezometer Monitoring 5
3.2.2 Groundwater Monitoring 6
3.2.2.1 Groundwater Elevation and Flow Monitoring 7
3.2.2.2 Groundwater Gradients and Flow Direction 8
3.2.3 Surface Water Monitoring 8
3.2.4 Landfill Gas Monitoring 11
3.3 Monitoring Procedures and Methods 12
3.3.1 Drive-Point Piezometer Monitoring 12
3.3.2 Groundwater Monitoring 12
3.3.3 Surface Water Monitoring 12
3.3.4 Landfill Gas Monitoring 13
3.3.5 Quality Assurance/Quality Control Program 13

4 Monitoring Results 14

4.1 Groundwater Quality 14
4.2 Surface Water Monitoring Locations Observations 19
4.3 Surface Water Quality Results 20
4.4 Landfill Gas Monitoring 20
4.5 QA/QC Results 21

4.6 Trigger Mechanisms and Contingency Plan 21

5 Assessment, Interpretation, and Discussion 22

5.1 Groundwater Assessment 22
5.1.1 Drive-Point Water Quality Assessment 23
5.1.2 Monitoring Well Water Quality Assessment 25
5.2 Surface Water Assessment 26
5.3 Landfill Gas Assessment 28
5.4 Mann-Kendall Analysis 29

6 Site Observations 32

6.1 Annual Waste Summary 32
6.2 Capacity and Remaining Site Life 34

7 Summary Statements, Conclusions, and Recommendations 34

7.1 Groundwater 34
7.1.1 Drive-Point Piezometers 34
7.1.2 Groundwater Monitoring Wells 35
7.2 Surface Water 36
7.3 Landfill Gas 36
7.4 Site Operations 37
7.5 Landfill Capacity 37

8 Limiting Conditions 37

9 References 39

List of Tables

Table 1: Contact Information _____ 2
Table 2: Drive-Point Piezometer Sampling Locations _____ 5
Table 3: Groundwater Monitoring Well Details _____ 6
Table 4: Groundwater Quality Monitoring Parameters _____ 7
Table 5: Groundwater Elevation Data _____ 8
Table 6: Surface Water Sampling Locations _____ 10
Table 7: Surface Water Quality Parameters _____ 10
Table 8: Surface Water Sampling Locations and Observations _____ 11
Table 9: Groundwater Quality Field Measurements _____ 15
Table 10: Groundwater Quality Parameters Not meeting ODWQS _____ 16
Table 11: Reasonable Use Calculations _____ 17
Table 12: Groundwater Quality Parameters Below or Exceeding RUV Criteria _____ 18
Table 13: Groundwater Quality Parameters Not Meeting PWQO Criteria _____ 19
Table 14: Surface Water Quality Parameter Exceedances _____ 20
Table 15: 2025 Landfill Gas Field Data _____ 21
Table 15: Annual Recycling and Waste Tonnages _____ 33
Table 17: 2025 Groundwater Chemistry Results _____ (end of text)
Table 18: 2025 Surface Water Chemistry Results _____ (end of text)

List of Figures

Figure 01: Site Location Map
Figure 02: Site Plan
Figure 03: Groundwater Elevations – Spring 2025
Figure 04: Groundwater Elevations – Fall 2025
Figure 05: Remaining Fill Capacity as of November 09, 2022

Site Photographs

List of Appendices

(Provided on USB Drive for Hard Copy)

Appendix A: A-1 Environmental Compliance Approval
A-2 Land Transfer Information
Appendix B: Monitoring and Screening Checklist (MECP/MOE)
Appendix C: Monitoring Well Logs
Appendix D: Inspection Forms, Laboratory Reports, and Chain of Custody Records
D-1 Operations and Inspection Forms
D-2 Groundwater Laboratory Reports
D-3 Surface Water Laboratory Reports (Including Toxicity)
D-4 QAQC Results
Appendix E: Historical Chemistry Data
E-1 Historical Groundwater Data
E-2 Historical Surface Water Data
Appendix F: Trigger Mechanisms and Contingency Plans
F-1 Previous Trigger Mechanism and Contingency Plan
F-2 Proposed Trigger Mechanism and Contingency Plan
Appendix G: Mann-Kendall Analysis

1 Introduction

This report provides a summary and analysis of environmental monitoring activities at the Musclow-Greenview Waste Disposal Site (WDS), in Maynooth, Ontario. The WDS is herein referred to as the "Site".

BluMetric Environmental Inc. (BluMetric®) was retained by The Corporation of the Municipality of Hastings Highlands (MHHs or Municipality) to conduct the 2025 environmental monitoring and sampling program and prepare the 2025 Annual Monitoring Report. This report is prepared in accordance with Condition 6 of the Environmental Compliance approval (ECA) No. A362303 (amended October 24, 2019), a copy of which is included in **Appendix A (A-1).**

This report covers all work and activities carried out for the period from January 1 to December 31, 2025. The report includes details on both the environmental monitoring and sampling program as well as details relating to Site operations, including the Waste Transfer (WT) areas at the Site.

The intent of this report is to be consistent with the general requirements of the Ontario Ministry of Environment, Conservation and Parks (MECP) document titled; Monitoring and Reporting for Waste Disposal Sites, 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 through 2025.

1.1 Location

The WDS is located on Part of Lot 11, Concession 11, at 3375 Musclow Greenview Road, Maynooth, Ontario in the Municipality of Hastings Highlands (Figure 01). The total area of the Site is 2.0 hectares (ha) with a 1.0 ha approved landfilling area. The Site layout is shown in Figure 02.

The Site is accessed via Musclow Greenview Road, east of Highway 62. There are approximately ten residences within 500 metres (m) of the Site. All are located topographically upgradient from the WDS.

1.2 Ownership and Key Personnel

The facility is operated by the MHHs, with the Municipal office located in Maynooth, Ontario. A copy of the land registry information showing the transfer of the land to the Township of Monteagle in 1980 is also provided in **Appendix A (A-2)**. The ownership of which was transferred to the MHHs under amalgamation procedures.

The facility's operational representative is responsible for all activities on-site. The Competent Environmental Practitioner (CEP) for both groundwater and surface water is Jaclyn Kalesnikoff, P.Geo., of BluMetric. Contact information is outlined in Table 1.

Table 1: Contact Information

Role	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 x289	dstewart@hastingshighlands.ca
CEP	Senior Hydrogeologist, BluMetric – Jaclyn Kalesnikoff, P.Geo.	1682 Woodward Drive, Ottawa, ON, K2C 3R8	(877) 487-8436 x 339	jkalesnikoff@blumetric.ca

1.3 Description and Development of the WDS

As mentioned above, the Site has a total area of 2.0 ha with a 1.0 ha approved landfilling area. In addition to domestic waste, the WDS also contains a scrap metal pile, a tire pile, a brush pile, a bulky waste pile, an electrical and electronic waste bin, and a recycling transfer station for handling aluminum, metal cans, plastic bottles, paper, cardboard, etc.

The initial development of the Site is unknown, and it is unlikely that studies were undertaken prior to the Site development. It is also unlikely that any engineering or cell planning was completed prior to the initial placement of waste. The original ECA is dated 1989, however anecdotally, it is believed that the first waste was placed around 1970.

1.4 Monitoring and Reporting Program 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. The monitoring and reporting program has been developed with these objectives in mind. In addition, the monitoring and reporting programs are

designed to adhere to the MECP's WDS-Technical Guidance (November 2010) document and the ECA for the Site. The amended ECA (October 2019) stipulates the requirements for surface water monitoring under Schedule B of the ECA. Historically, the Municipality has undertaken monitoring voluntarily because of the potential for Site runoff to impact surface water (from 2006 onward). Shallow groundwater monitoring was initiated in the fall of 2016 with the installation of drive-point piezometers at the Site. The ECA now stipulates groundwater monitoring of the drive point piezometers in Schedule C of the ECA. Subsequent to the ECA Amendment, the MECP requested that additional Site characterization be carried out and that a leachate and background well be installed at the Site. Three groundwater monitoring wells were installed at the Site in December 2018.

2 Physical Setting

2.1 Geology and Potential Receptors

2.1.1 Surficial Geology

The surficial geology underlying the Site is sand and gravel as determined from groundwater well information from the online Groundwater Information Network (GIN). Geological maps describe the surficial geology as glaciofluvial outwash deposits (MNDM, 2556). The immediate area of the Site is characterized by sand and gravel overburden with a thickness ranging from 0 to 3 metres below ground surface (mbgs) overlying bedrock. Further Site characterization work was carried out in December 2018 which encountered a range of overburden thickness from 8.5 mbgs to 14.5 mbgs along the north and west sides of the waste footprint. The monitoring well logs are provided in **Appendix C**.

2.1.2 Bedrock Geology

The Musclow-Greenview WDS is located within the Grenville geological province, on Precambrian metamorphic bedrock. The bedrock geology of the area is predominantly clastic metasedimentary rocks (for example conglomerate, wacke, quartz arenite, arkose, limestone) to mafic to ultramafic plutonic rocks such as diorite, gabbro, periodite, pyroxenite, anorthosite, derived metamorphic rocks (Map 2544, MNDM). The undifferentiated igneous and metamorphic rock is exposed at surface or covered by a discontinuous, thin layer of drift (Map 2556, MNDM).

2.2 MECP Well Records

A groundwater well information search in 2015 indicated that there are eight domestic wells within 0.5 km of the Site, and 25 domestic and two municipal wells within 1.5 km of the Site. Records show all wells are drilled into bedrock at depths of 30 mbgs or more. Only three of the wells appear to be topographically downgradient from the Site.

2.3 Surface Water Features

The Site is situated along the edge of a topographic high and is bordered by low-lying land to the north and west. The low-lying areas are connected to a wetland southwest of the WDS. These areas are designated as an Environmental Protection area. Based on the topography, the area to the north of the Site contains surface water that is primarily stagnant and if there is any flow, it flows east to west. The wetland area to the west of the Site drains south and west to an unnamed lake, however, a direct connection has not been observed during field investigations. Forested land makes up the majority of the remainder of the surroundings.

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

- Unnamed Lake, 0.25 km southwest of the Site (Figure 01).
- Goodkey Creek, 0.6 km west of the Site (Figure 01), which flows north from the unnamed lake.

3 Description of Monitoring Program

3.1 Site Inspections and Operations Monitoring

Site visits to the Musclow-Greenview WDS were conducted on May 5, 2025, and October 16, 2025. In addition, a routine planned inspection was conducted at the site on October 1, 2025 with MHH staff and MECP personal. The purpose of this inspection was to assess compliance with the conditions of the ECA and relevant waste related policies, guidelines and legislation, and the current management of the Site.

The detailed site checklists are provided in **Appendix D (D-1)**. Generally, the Site was in good condition although the following concerns were noted:

- Plastic was blown across the site to the brush pile and should be removed. MHH workers were on-site during the spring inspection assisting to clean up.
- The bulky waste pile was noted to be large during both the spring and fall inspections.

- Monitoring well MG-18-2 was noted to be broken in the spring and included on repair list.

The locations of groundwater and surface water monitoring locations are shown on the Site plan (Figure 02). 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 Drive-Point Piezometer Monitoring

The Musclow-Greenview WDS has five drive-point piezometers which were installed to determine if impacted shallow groundwater from the Site is discharging to surface water, and the locations are shown on the Site Plan (Figure 02). Four of the drive-point piezometers, MG-DP1 to MG-DP4, were installed by BluMetric personnel on October 6, 2016, and were installed from 2.3 mbgs to 2.9 mbgs. More detailed installation data for MG-DP1 to MG-DP4 was provided in the 2016 Annual Monitoring Report. The fifth drive-point piezometer (MG-DP5) was installed by BluMetric personnel on October 20, 2021, to a depth of 2.63 mbgs.

Drive-point piezometers are monitored on a semi-annual basis (spring and fall). **Table 2** summarizes the coordinates and monitoring location descriptions of the drive-point piezometers.

Table 2: Drive-Point Piezometer Sampling Locations

Sample Location	Northing	Easting	Description
MG-DP1	5,010,719	279,833	Adjacent to MG-SW1 approximately 75 m north of the waste mound.
MG-DP2	5,010,642	279,776	Adjacent to MG-SW2, approximately 45 m NW of the toe of the waste mound.
MG-DP3	5,010,568	279,750	Adjacent to MG-SW-3 approximately 55 m SW from the toe of the waste mound.
MG-DP4	5,010,676	279,838	Located approximately halfway between MG-SW-1 and the waste mound, approximately 35 m north of the waste mound.
MG-DP5	5,010,576	279,699	Located approximately 50 m west of MG-DP3 and 15 m northeast of MG-SW6, approximately 100 m west-southwest of the waste mound.

Note: An elevation survey was carried out on January 10, 2019, and provides the data in Table 5 for MG-DP1 to MG-DP4. An additional survey on October 20, 2021, provides the data for MG-DP5. Coordinates are in NAD 83 and Zone 18.

Groundwater samples were collected from the drive-point piezometers on May 5, 2025, and October 16, 2025. The laboratory reports and chain of custody records are included in **Appendix D**

(D-2). Table 4 below lists the groundwater quality monitoring parameters. Field measurements of groundwater pH, temperature, and conductivity were collected at the time of sampling.

3.2.2 Groundwater Monitoring

The Musclow-Greenview WDS is monitored on a semi-annual basis (spring and fall). Three groundwater monitoring wells (MG-18-1, MG-18-2, and MG-18-3) were installed at the Site between December 18 and 20, 2018, and were surveyed on January 10, 2019. The groundwater sampling locations are illustrated on the Site Plan (Figure 02). These groundwater monitoring wells were installed as per the 2018 ECA amendment for the Site, which stipulated that further investigation into groundwater and surface water impacts be conducted within 12 months after issuance of the amendment. Bedrock drilling did not occur. Due to the background monitoring well MG-18-3 continuously being dry and being unable to collect a sample, a replacement well, MG-18-3R, was installed on September 18, 2023, to a depth of 16.2 mbgs. The boreholes were drilled to depths of 17.4 mbgs, 21.5 mbgs, and 16.2 mbgs (MG-18-1, MG-18-2, and MG-18-3R, respectively) and are completed in the overburden unit. **Table 3** summarizes the GPS coordinates and location description of the groundwater monitoring wells. Monitoring well logs are provided in **Appendix C**.

Table 3: Groundwater Monitoring Well Details

Sample Location	Northing (m)	Easting (m)	Description	Screened Interval(mbgs)
MG-18-1	5,010,620	279,830	Leachate characterization well (inside the approved footprint of the Site). North edge of the site.	14.33 to 17.38
MG-18-2	5,010,588	279,805	Leachate characterization well (inside the approved footprint of the Site). West side of the site.	18.28 to 21.30
MG-18-3	5,010,638	279,919	Installed to monitor background groundwater quality. East side of the site, depth was limited by boulders encountered during drilling. Monitoring well was decommissioned due to historical dry conditions.	4.72 to 6.25
MG-18-3R	5,010,639	279,918	Installed on September 18, 2023, to replace original background monitoring well, MG-18-3. East side of the site, directly adjacent to MG-18-3.	13.10 to 16.15

Note: Elevations and coordinates as per BluMetric surveys (January 2018, October 2021, and September 2023). NAD 83 and Zone 18.

Groundwater was sampled from the groundwater monitoring locations on May 5, 2025, and October 16, 2025. The laboratory reports and chain of custody records are included in **Appendix D (D-2)**. **Table 4** lists the groundwater quality parameters which were analyzed in 2025.

Table 4: Groundwater Quality Monitoring Parameters

Category	Parameters
Organic Parameters	Biochemical Oxygen Demand (BOD_5), Dissolved Organic Carbon (DOC), Chemical Oxygen Demand (COD)
Inorganic Parameters	Nitrate, Ammonia, Chloride, Major Ions (Sodium, Calcium, Magnesium, Sulphate, Alkalinity)
Metals (dissolved)	Iron, Chromium, Lead, Cadmium, Boron, Barium, Aluminum, Cobalt, Manganese, Silver, Zinc
Volatile Organic Compounds (VOC)*	Vinyl Chloride, Methylene Chloride, Benzene, Toluene, and 1,4-Dichlorobenzene
Other	Electrical Conductivity, pH (lab), Total Dissolved Solids (TDS), Total Suspended Solids (TSS)

Note: *MECP requested leachate wells be analyzed for VOCs in 2020. Since there were criteria exceedances, these wells were analyzed for VOCs again in 2022. VOC sampling was not conducted in 2023; however, a VOC sampling event was completed in 2024. In 2025 no VOC sampling was conducted.

Field measurements of groundwater pH, temperature, and conductivity were collected at the time of sampling.

During the 2025 monitoring events, the conditions of groundwater monitoring wells were inspected. Any repairs, such as new locks, labels, or well caps, were made as necessary. 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.

Monitoring well MG-18-2 was identified during the spring inspection as requiring repair but the repair was not completed. The required repairs have been scheduled to be completed in 2026.

3.2.2.1 Groundwater Elevation and Flow Monitoring

During both monitoring events groundwater elevations were collected from each of the groundwater monitoring wells. Groundwater level measurements were collected using a Solinst electronic water level meter prior to the purging/sampling activity.

Groundwater elevations are typically not measured at drive-point locations because the water level tape cannot fit in the casing. Consequently the 2025 groundwater elevation data include only one drive-point measurement (MG-DP5). Groundwater elevation data is summarized in **Table 5**.

Table 5: Groundwater Elevation Data

Groundwater Monitor	Elevation (TPVC)[1] (masl)2	Water Level (m) 5-May-25	Groundwater Elevation (masl) 5-May-25	Water Level (m) 16-Oct-25	Groundwater Elevation (masl) 16-Oct-25
MG-DP1	377.55	NR	NR	NR	NR
MG-DP2	376.56	NR	NR	NR	NR
MG-DP3	376.63	NR	NR	NR	NR
MG-DP4	377.28	NR	NR	NR	NR
MG-DP5	376.80	1.00	375.80	1.53	375.27
MG-18-1	391.01	11.27	379.74	13.86	377.15
MG-18-2	395.96	NR[1]	N[1]	NR[1]	NR[1]
MG-18-3	390.80	NA	NA	NA	NA
MG-18-3R	390.78	7.67	383.11	11.82	378.96

Notes: Elevations and coordinates as per BluMetric surveys (January 2018, October 2021, September 2023). NAD 83 and Zone 18.

TPVC – Elevation (m) at top of PVC casing
masl metres above sea level
[1] - monitoring well broken, unable to measure water level
NR – no reading, water levels were not recorded at these locations
NA – not applicable

3.2.2.2 Groundwater Gradients and Flow Direction

Groundwater elevations were not measured at the drive-point piezometers (except for MG-DP5). During both events in 2025, the direction of groundwater flow is inferred to be toward the northwest, Note that while there are three elevations for triangulation of the groundwater surface, the spatial distribution is limited, therefore there may be error in the inferred groundwater flow direction. Historical data varies but generally, shallow groundwater is inferred to be mounding below the WDS and flowing radially away from the Site towards the west. A wetland is located approximately 140 m to the southwest of the final waste footprint. The wetland is adjacent to an unnamed lake which discharges to the north towards Goodkey Creek.

3.2.3 Surface Water Monitoring

Under the ECA, the current surface water monitoring program consists of four locations (historical locations MG-SW1, MG-SW2, MG-SW3, and a background location) which are monitored on a semi-annual frequency. The current background location is MG-SW4A. The sampling locations are identified on Figure 03. Location MG-SW1 is located north of the landfill. Location MG-SW2 is located near the north-northwest toe of the landfill and is intended to provide results reflective of potential runoff related impacts in this direction. Location MG-SW3 is located downstream of the

landfill and is used to monitor potential surface water impacts from the landfill to the west and potentially to the lake southwest of the Site. Location MG-SW4A is an up-gradient background sample location collected from Goodkey Creek approximately 1 km north of the Site.

Previously, background surface water was sampled at location MG-SW4 and MG-SW5. These locations were found to be frequently dry and therefore were replaced by the current background location MG-SW4A. The former sample locations MG-SW4 and MG-SW5 are shown on Figure 02.

One-time, supplemental surface water samples (MG-SW6 and MG-SW7) were collected in the late summer and early fall of 2020 as requested by the MECP. Location MG-SW6 is located approximately 70 m west of MG-SW3 and MG-SW7 is located approximately 130 m southwest of MG-SW3. These two supplemental surface water sampling locations are illustrated on Figure 03 and Figure 04. These locations were sampled to assist in determining the extent of potential downgradient WDS impacts on surface water. MG-SW6 should be sampled on a semi-annual frequency and MG-SW7 should be sampled every five years (e.g., 2025, 2030, etc.). During the spring monitoring event, samples were collected from both MG-SW6 and MG-SW7. During the fall monitoring event, a sample was collected only from MG-SW7, as MG-SW6 was dry at the time of sampling.

Surface water samples were collected from MG-SW1, MG-SW2, MG-SW3, MG-SW4A, MG-SW6, and MG-SW7 on May 5, 2025, and from MG-SW4A and MG-SW7 on October 16, 2025. Samples could not be collected from the other locations during the October sampling event due to dry conditions. Each sampling station was photographed, and physical conditions (velocity and watercourse dimensions) were documented. Table 6 details the GPS coordinates and general descriptions for the sample locations.

Table 6: Surface Water Sampling Locations

Sample Location	Northing	Easting	Location Description
ECA Sampling Locations			
MG-SW1	5,010,713	279,836	90 m north of the final waste footprint.
MG-SW2	5,010,640	279,775	45 m northwest of the toe of the final waste mound.
MG-SW3	5,010,566	279,754	55 m southwest from the toe of the final waste mound.
MG-SW4A (Background)	5,011,183	279,650	Goodkey Creek is approximately 860 m northwest of the final waste footprint.
Supplemental Sampling Locations			
MG-SW6	5,010,569	279,685	70 m west of MG-SW3 and 120 m west of the final waste footprint, sampled semi-annually
MG-SW7	5,010,539	279,636	130 m southwest of MG-SW3 and 180 m west of the final waste footprint, sampled every five years.
Former Background Locations			
MG-SW4	5,011,754	279,563	Goodkey Creek is approximately 1 km north of the final waste footprint.
MG-SW5	5,011,732	279,580	Off of the access road to the municipal aggregate pit, approximately 600 m to the north of the final waste footprint.

Note: NAD 83 datum, UTM Zone 18

Surface water temperature, pH, conductivity, and dissolved oxygen field measurements were recorded at the time of sampling. The field pH values ranged from 6.49 to 7.40 in the spring and 6.96 to 7.29 in the fall. Surface water samples were analyzed for the parameters listed in Schedule B of the ECA. Table 7 lists the surface water quality parameters which were analyzed in 2025.

Table 7: Surface Water Quality Parameters

Category	Parameters
Biological Parameters	BOD_5
Organic Parameters	COD, Phenols
Inorganic Parameters	Alkalinity, Chloride, Nitrite, Nitrate, Sulphate, Phosphorous (total), Total Kjeldahl Nitrogen (TKN), Ammonia (N) – Total, Calcium, Aluminum – Dissolved, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Potassium, Sodium, Zinc
Physical/Chemical Parameters	pH, Conductivity, TDS, TSS, Total Hardness (as CaCO3)

Surface flow measurements were collected 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 8 summarizes the calculated flow measurements and water clarity observations for each location.

Table 8: Surface Water Sampling Locations and Observations

Date	Location	Field Observations
May 5, 2025	MG-SW1	Flooded wetland, no flow observed. Water clear, light brown. Sample collected.
	MG-SW2	Flooded wetland, minimal flow observed. Large area with red/orange precipitate. Sample collected.
	MG-SW3	Swampy area, no direct flow path, trickle observed. Water clear, light brown, some floating solids. Sample collected; one pail for toxicity.
	MG-SW4A	Flow = 0.45 m/s. Beaver activity upstream and downstream. Water clear, light brown tinge. Sample collected; duplicate.
	MG-SW6	Wetland, minimal flow observed. Water clear, light brown; minnows observed collected.
	MG-SW7	Wetland, no flow observed. Water clear with minor brown colour. Sample collected.
October 16, 2025	MG-SW1	Dry. Sample could not be collected.
	MG-SW2	Dry. Sample could not be collected.
	MG-SW3	Dry. Sample could not be collected.
	MG-SW4A	Shallow depth, no flow due to beaver activity. Water clear with some suspended solids. Sample collected; duplicate.
	MG-SW6	Dry. Sample could not be collected.
	MG-SW7	Wetland, no flow observed. Organic sheen on water surface, water clear. Sample collected.

3.2.4 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 as follows:

- Less than 2.5% methane gas (25,000 ppm, LEL=50%) in the subsurface at the property;
- 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 Drive-Point Piezometer Monitoring

Drive-point piezometer purging and sampling was conducted using a peristaltic pump. Minimum purge and ultra-low flow rate techniques were used to purge and sample each drive-point. Each location was purged of the standing water in the sample tubing prior to filling sample bottles. In the case where a drive-point was purged dry, samples were collected after sufficient water had recovered. Field temperature, pH, and conductivity measurements were recorded at the time of sampling using a YSI 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 for analysis to Bureau Veritas (BV) Laboratories. Laboratory reports and chain of custody forms are compiled in **Appendix D (D-2)**. Bureau Veritas is an accredited member of the Canadian Association of Laboratory Accreditation (CALA).

3.3.2 Groundwater Monitoring

Groundwater monitoring wells 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, and conductivity measurements were recorded at the time of sampling using a YSI 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 (BV) Laboratories. Laboratory reports and chain of custody forms are compiled in **Appendix D (D-2)**.

3.3.3 Surface Water Monitoring

Field temperature, pH, conductivity, and dissolved oxygen measurements were recorded in the field at the time of sampling. During both sampling events the field parameters were measured using a YSI multi-meter calibrated as per the manufacturer's instructions prior to the Site visits. Surface water samples were filtered by the laboratory for the dissolved aluminum analysis.

Surface water samples were collected in laboratory-prepared and supplied bottles and submitted to Bureau Veritas (BV) Laboratories. Surface water samples were stored at approximately 4° Celsius during shipment to BV Laboratories 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 (D-3)**.

3.3.4 Landfill Gas Monitoring

An RKI Eagle gas monitor with methane detection was used to monitor landfill gas at the Site during the semi-annual monitoring events.

There are no sampling valves, ports, or vapour monitors on-site. Gas monitoring was conducted for the site attendant's building and from the groundwater monitoring wells and drive-point piezometers during both the spring and fall 2025 sampling events. Gas monitoring measurements from the groundwater monitoring wells were collected prior to collecting groundwater levels or samples. These measurements were completed 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.

3.3.5 Quality Assurance/Quality Control 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 per sample matrix was collected during each sampling event at the WDS.

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:

$$RPD = 2 \times \frac{|(S - D)|}{(S + D)} \times 100$$

Where: S = concentration in the original sample
D = concentration in 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 readable 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 can produce repeatable results.

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

One blind field duplicate per media was sampled and submitted for analysis during each of the sampling events. The field duplicate bottles were filled simultaneously with the actual sample bottles at the sample location selected for duplication. The laboratory prepared bottles (identified and duplicate) for each group of chemical parameters (e.g., metals, nutrients, general chemistry etc.) were filled simultaneously to ensure identical water was collected into each container. This continued for each matching parameter group bottle until both sample bottle sets for that location were filled.

4 Monitoring Results

4.1 Groundwater Quality

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

The field pH results for events in 2025 ranged from 6.47 to 8.36 in the spring and ranged from 6.59 to 7.32 in the fall, as indicated in Table 9 below. Low pH values are typical in the region.

Table 9: Groundwater Quality Field Measurements

Groundwater Monitor	pH		Temperature (°C)		Conductivity (µS/cm)	
	5-May-25	16-Oct-25	5-May-25	16-Oct-25	5-May-25	16-Oct-25
MG-DP1	7.34	7.32	8.0	9.5	757	747
MG-DP2	6.68	6.85	9.2	9.5	333.8	320.6
MG-DP3	6.66	6.63	8.2	9.9	1501	1536
MG-DP4	8.36	NM	9.5	NM	240.6	NM
MG-DP5	7.06	6.87	8.5	8.8	1054	1052
MG-18-1	6.47	6.59	9.7	9.2	724	547
MG-18-2	NM	NM	NM	NM	NM	NM
MG-18-3R	7.08	6.77	8.4	7.5	158.1	137.7

Note: [1] EL-MW1 insufficient water to collect field parameters after sampling.
°C – degrees Celsius
µS/cm – micro Siemens per centimetre
NM: not monitored: MG-18-2 was damaged and a water level could not be taken (spring and fall); MG-DP4 had insufficient water (fall)

Ontario Drinking Water Standards, Objectives and Operational Guidelines

The 2025 drive-point and monitoring well water quality analytical results are shown in Table 16 (end of the text). The laboratory reports and chain of custody records are included in **Appendix D (D-3)**. The groundwater chemistry results were compared to the ODWQS and parameters with results falling outside the criteria are summarized in Table 10 below.

Table 10: Groundwater Quality Parameters Not meeting ODWQS

Location	General Description	Parameter(s) Not Meeting ODWQS
Drive-point Piezometer Data		
MG-DP1	Downgradient to the north of the WDS	DOC TDS (Spring) Dissolved Manganese
MG-DP2	Downgradient to the northwest of the WDS	DOC Manganese
MG-DP3	Downgradient to the west of the WDS	Alkalinity DOC TDS Dissolved Iron Dissolved Manganese
Drive-point Piezometer Data		
MG-DP4	Downgradient to the north of the WDS	DOC (Spring)
MG-DP5	Downgradient to the west of the WDS	DOC TDS Dissolved Iron Dissolved Manganese Dissolved Zinc
Monitoring Well Data		
MG-18-1	Leachate well on the north side of the WDS	DOC (Spring) TDS (Spring) Dissolved Iron Dissolved Manganese
MG-18-2	Leachate well on the west side of the WDS	Damaged
MG-18-3R	Replacement background well on the east side of the WDS	None

A limited suite of VOCs was analyzed at monitoring wells MG-18-1 and MG-18-2 during the fall 2019, 2020, and 2021 sampling events, and for the spring 2022 event. A full suite of VOCs was analyzed during the fall 2022 and spring 2024 sampling events. During the spring 2024 sampling event, concentrations of benzene and vinyl chloride at MG-18-2 exceeded the ODWQG. Exceedances of benzene and vinyl chloride at MG-18-2 have also been reported for previous sampling events, indicating a recurring condition at this location.

Reasonable Use Values (RUVs)

The following calculations are based on the background groundwater (MG-18-3 and MG-18-3R) quality between May 2019 and October 2025 sampling events. It is important to note that the

RUVs are based on only five data points (five sampling events)and as more sampling events are added to the calculations, the reliability of the RUVs will increase.

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

Where:

- Cm: maximum allowable concentration in groundwater beneath adjacent property (RUV)
- 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 MECP 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)

The following Table 11 summarizes the data used to calculate Cm values (RUVs).

Table 11: Reasonable Use Calculations

Parameter	Units	ODWSOG	Historical Median	x	RUV
		Cr	Cb		Cm
Alkalinity (lower)	mg/L	30	65.5	0.5	47.75
Alkalinity (upper)	mg/L	500	65.5	0.5	282.75
Aluminum (diss)	mg/L	0.1	0.00245	0.5	0.051225
Barium (diss)	mg/L	1	0.016	0.25	0.262
Boron (diss)	mg/L	5	0.0075	0.25	1.25563
Cadmium (diss)	mg/L	0.005	0.000045	0.25	0.0012837
Chloride	mg/L	250	0.5	0.5	125.25
Chromium (diss)	mg/L	0.05	0.0025	0.25	0.014375
Dissolved Organic Carbon	mg/L	5	1.95	0.5	3.475
Iron (diss)	mg/L	0.3	0.05	0.5	0.175
Lead (diss)	mg/L	0.01	0.00025	0.25	0.0026875
Manganese (diss)	mg/L	0.05	0.0315	0.5	0.04075
Nitrate as N	mg/L	10	0.05	0.25	2.5375
pH (lower)	Unitless	6.5	7.355	0.5	6.9275
pH (upper)	Unitless	8.5	7.355	0.5	7.9275
Sodium (diss)	mg/L	200	3	0.5	101.5
Sulphate	mg/L	500	7.15	0.5	253.575
Total Dissolved Solids	mg/L	500	280	0.5	390
Zinc (diss)	mg/L	5	0.0025	0.5	2.50125

Notes: mg/L – milligrams per litre

Parameters from the 2025 Musclow-Greenview WDS monitoring program that exceeded the RUVs are shown in Table 12 below.

Table 12: Groundwater Quality Parameters Below or Exceeding RUV Criteria

Location	Parameter(s) Below or Exceeding RUV Criteria
Drive-Point Data	
MG-DP1	DOC pH (upper limit in spring) TDS Dissolved Manganese
MG-DP2	DOC Dissolved Manganese
MG-DP3	Alkalinity (upper limit) DOC TDS Dissolved Iron Dissolved Manganese
MG-DP4	DOC pH (upper limit in spring)
MG-DP5	Alkalinity (upper limit) DOC TDS Dissolved Iron Dissolved Manganese Dissolved Zinc
Monitoring Well Data	
MG-18-1	DOC TDS (spring) Dissolved Iron Dissolved Manganese
MG-18-2	Damaged
MG-18-3R	None

Provincial Water Quality Objectives (PWQO)

Since groundwater has the potential to discharge to surface water at the Musclow-Greenview WDS, groundwater has also been compared to PWQO for surface water. The results are presented in Table 16 at the end of the text. The parameters not meeting PWQO criteria are summarized below in Table 13.

Table 13: Groundwater Quality Parameters Not Meeting PWQO Criteria

Location	General Description	Parameter(s) Not Meeting PWQO
Drive-Point Data		
MG-DP1	Downgradient to the north of the WDS	None
MG-DP2	Downgradient to the northwest of the WDS	None
MG-DP3	Downgradient to the west of the WDS	Dissolved Boron Dissolved Cobalt Dissolved Iron
MG-DP4	Downgradient to the north of the WDS	None
MG-DP5	Downgradient to the west of the WDS	Dissolved Cobalt Dissolved Iron Dissolved Zinc
Monitoring Well Data		
MG-18-1	Leachate well on the west side of the WDS	Dissolved Cobalt Dissolved Iron
MG-18-2	Background well on the east side of the WDS	Damaged
MG-18-3R	Leachate well on the west side of the WDS	None

The 2025 groundwater analytical results are presented on Table 17. Historical groundwater data is provided in **Appendix E (E-1)**.

4.2 Surface Water Monitoring Locations Observations

Based on Site observations, it appears that surface water does not have a direct flow pathway from the landfill mound and is relatively stagnant in the northwest and north portions of the Site, particularly at MG-SW1. This is especially true in the drier summer months and when water levels in the wetland are low. The wetland area surrounding the northwest and west sides of the WDS ultimately drains toward MG-SW3 and MG-SW6 which act as the downgradient sampling locations. These historical observations were confirmed during the spring sampling event, with no flow observed at MG-SW1, MG-SW3, and MG-SW7, and minimal flow observed at MG-SW2 and MG-SW6. The background location (MG-SW4A) exhibited a measured flow of 0.45 m/s, and beaver activity was observed both upstream and downstream of the location. During the spring samples were collected from all locations.

During the fall sampling event, locations MG-SW1, MG-SW2, MG-SW3, and MG-SW6 were observed to be dry, and no samples were collected. The background location (MG-SW4A) had water present with no observable flow, and MG-SW7 also had water present with no observable flow. Samples were collected from MG-SW4A and MG-SW7.

4.3 Surface Water Quality Results

Surface water quality results were compared to PWQO. 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 18 summarizes the parameters that exceeded PWQO (and does include WDS Technical Guidance Table A and Table B criteria as a reference only).

Table 14: Surface Water Quality Parameter Exceedances

Location	Exceeded PWQO
MG-SW1	Total Iron (spring)
MG-SW2	Total Phosphorus (spring) Total Iron (spring)
MG-SW3	Total Boron (spring)
MG-SW4A	Phenols (fall) Total Phosphorus (fall) Total Cobalt (fall) Total Iron (fall)
MG-SW6	Total Phosphorus (spring)
MG-SW7	Total Phosphorus (fall) Total Iron (fall)

The average 2025 alkalinity concentration at MG-SW4A (background location in the creek) was 44.0 mg/L. Alkalinity is typically low in the region. Under the PWQO, alkalinity concentrations should not be reduced by more than 25 percent, corresponding to a threshold of 33.0 mg/L based on background conditions. During the spring 2025 sampling event, the alkalinity concentration at MG-SW4A was 32.0 mg/L, and the alkalinity concentration at MG-SW7 was 21.0 mg/L. All other alkalinity concentrations measured during the 2025 sampling events were above 33.0 mg/L.

The 2025 surface water results are presented on Table 18. Historical surface water data is provided in **Appendix E (E-2)**.

4.4 Landfill Gas Monitoring

Landfill gas readings collected during the 2025 spring and fall sampling events are presented in Table 15 below.

Table 15: 2025 Landfill Gas Field Data

Building	Description of Reading Location	Reading (ppm)
May 5, 2025, Sampling Event		
Attendant's Building	RKI probe inserted through main door	0
DP1	Well head	40
DP2	Well head	40
DP3	Well head	0
DP4	Well head	30
DP5	Well head	40
MG-18-1	Well head	15
MG-18-2	Well head	Damaged
MG-18-3	Well head	0
October 16, 2025, Sampling Event		
Attendant's Building	RKI probe inserted through main door	5
DP1	Well head	20
DP2	Well head	10
DP3	Well head	0
DP4	Well head	15
DP5	Well head	0
MG-18-1	Well head	15
MG-18-2	Well head	Damaged
MG-18-3R	Well head	10

4.5 QA/QC Results

One groundwater duplicate and one surface water duplicate sample were collected during each of the spring and fall 2025 sampling events. The consistency of the results was evaluated using the relative percent difference (RPD) for each duplicate pair. For the groundwater duplicates collected during the fall event, TDS and TSS exceeded the QA/QC criteria, with RPDs of 50% and 70%, respectively. No surface water duplicate parameters exceeded QA/QC criteria during either the spring or fall sampling events.

The QA/QC results are provided in **Appendix D (D-4).**

4.6 Trigger Mechanisms and Contingency Plan

In August 2019, BluMetric in consultation with the MECP developed revised Trigger Mechanisms and Contingency Plans for the Musclow-Greenview WDS. This document is provided in **Appendix F, Item F1**. Following review of the 2024 AMR, and based on new data obtained between 2019

and 2025 and technical surface water review, an updated proposed Trigger Mechanisms and Contingency Plan is provided as **Item F2**.

As part of the current trigger plan, MG-SW3 and MG-DP3 are considered the surface water and groundwater water trigger assessment points for the western property boundary, respectively.

Surface water location MG-SW3 is sampled semi-annually. Trigger assessment criteria are total iron, total boron, total lead, dissolved aluminum, unionized ammonia, and total zinc. The contingency plan is activated if two or more of the assessment criteria exceeds PWQO. The MG-SW3 analytical results in 2025 did not trigger the Tier 1 Contingency Plan response for surface water.

MG-SW3 is also sampled semi-annually for toxicity results. A toxicity sample was collected from MG-SW3 during the spring but was found to be dry in the fall. This test includes single-concentration acute lethality testing of Daphnia magna (48 hour) and rainbow trout (96 hour). The single concentration test is typically reported as a “pass” or “fail” test, with 50% mortality being the passing limit. The results from the toxicity testing at MG-SW3 for the spring sampling event indicated that the percent mortality for Daphnia magna was 3.3% and Rainbow Trout were 10%. The MG-SW3 toxicity results in 2025 did not trigger the Tier 1 Contingency Plan response for surface water. The toxicity laboratory results are presented in **Appendix D (D-3).**

In addition, groundwater discharges to surface water before the property line, so the intent of Guideline B-7 is satisfied. As such, a Trigger Mechanisms and Contingency Plan for groundwater is not necessary at this time but could be considered in the future.

5 Assessment, Interpretation, and Discussion

5.1 Groundwater Assessment

Groundwater chemistry results for the five drive-point piezometers and on-site monitoring wells sampled during the two 2025 monitoring events are summarized in Table 16 (end of text). Parameters exceeding the RUVs, ODWQS, and/or PWQO are identified and flagged within the table.

Historical groundwater quality data for the Musclow-Greenview WDS are provided in Appendix E-1. Trend graphs for select parameters are included following the tables, figures, and photographs at the end of this report to support evaluation of long-term groundwater quality trends.

5.1.1 Drive-Point Water Quality Assessment

MG-DP1:
Drive-point MG-DP1 is located north of the WDS and is considered downgradient based on the radial groundwater flow pattern away from the Site. Since monitoring began in 2016, groundwater quality at MG-DP1 has generally remained stable, with slight increasing trends observed for barium, chloride, sodium, and TDS. Sulphate concentrations are the highest among the drive-point locations; however, they remain well below ODWQS and RUV.

Exceedances of ODWQS and RUV in 2025 were limited to DOC, TDS, and dissolved manganese. No PWQO exceedances were recorded at this location.

MG-DP2:
Drive-point MG-DP2 is located northwest of the waste mound toe and is considered downgradient. Groundwater quality at this location has remained generally consistent since monitoring began in 2016.

Exceedances of ODWQS and RUV were limited to DOC and dissolved manganese. No PWQO exceedances were recorded at this location.

MG-DP3:
Drive-point MG-DP3 is located immediately beyond the western property boundary and is considered downgradient. Results indicate impacts consistent with WDS influence at this location. Persistent exceedances of ODWQS, RUV, and PWQO have been recorded for several parameters, including alkalinity, DOC, TDS, dissolved boron, dissolved cobalt, dissolved iron, and dissolved manganese.

PWQO exceedances for 2025 included dissolved boron, dissolved cobalt, and dissolved iron. Although boron concentrations remain below ODWQS, they have consistently exceeded interim PWQO since 2017.

Based on 2025 results, shallow groundwater in the vicinity of MG-DP3 has the potential to influence surface water at MG-SW3. Continued monitoring is warranted to evaluate downgradient migration trends.

MG-DP4:

Drive-point MG-DP4 is located north of the WDS, between MG-DP1 and the waste mound. Concentrations have generally remained stable since 2016. A significant aluminum exceedance was observed during the Fall 2022 sampling event (exceeding RUV and PWQO); however, subsequent results (2023–2025) have been at or near laboratory detection limits, indicating that the 2022 result does not represent an emerging trend.

In 2025, DOC exceeded ODWQS criteria during both sampling events and exceeded the RUV during the spring event only. pH exceeded the upper limit during the spring event. No other exceedances were recorded. Concentrations of several parameters remain higher at MG-DP1 relative to MG-DP4.

MG-DP5:

Drive-point MG-DP5 is located further downgradient beyond the western property boundary, west of MG-DP3. Results suggest potential WDS-related impacts at this location. Since monitoring began in fall 2021, increasing concentrations of dissolved iron and dissolved manganese have been observed. Dissolved cobalt concentrations peaked in 2023 and decreased in 2025, although they remain elevated relative to earlier results.

Exceedances of ODWQS, RUV, and PWQO include alkalinity, DOC, TDS, dissolved cobalt, dissolved iron, dissolved manganese, and dissolved zinc. Continued monitoring is required to assess downgradient migration and potential surface water interactions. Based on these results, continued semi-annual sampling of MG-SW6 is recommended.

DOC Considerations:

Elevated DOC concentrations may, in part, reflect natural wetland influences. Published DOC ranges for marshes and peatlands are approximately 19–38 mg/L (Moore, 2003), and the majority of 2025 results fall below this range. Exceptions include MG-DP2 (spring: 19.0 mg/L) and MG-DP3 (fall: 23.0 mg/L). However, historical DOC concentrations at the Site ranging from 59.9 to 185 mg/L are likely indicative of WDS influence rather than natural background conditions.

Interpretation and Recommendations:

Groundwater at the Site is expected to discharge to surface at or before the property boundary. Based on current data, groundwater downgradient of the WDS property boundary is generally anticipated to remain compliant with Guideline B-7; however, localized impacts are evident at MG-DP3 and MG-DP5.

Given recent exceedances and observed trends, it is recommended that the Municipality plan for a focused assessment of downgradient groundwater conditions to further evaluate potential WDS-related migration. Continued semi-annual monitoring at MG-DP3, MG-DP5, and associated surface water locations is warranted to track temporal trends and confirm the extent of impact.

5.1.2 Monitoring Well Water Quality Assessment

Groundwater quality at the Site is monitored using three on-site wells: MG-18-1, MG-18-2, and MG-18-3/MG-18-3R. Monitoring well MG-18-3R was installed adjacent to the original background well MG-18-3 in response to MECP direction (July 2019), which indicated that an alternate background well would be required if MG-18-3 continued to be dry.

MG-18-1:

MG-18-1 is a leachate characterization well located along the northern edge of the approved waste footprint. Groundwater quality at this location has remained generally consistent since monitoring began in 2019; however, persistent criteria exceedances indicative of leachate influence have been observed.

Historically, frequent RUV and ODWSOG exceedances of dissolved manganese and consistent PWQO exceedances of dissolved cobalt have been reported. In addition, consistent RUV exceedances of dissolved iron (since October 2021), TDS, and DOC have occurred since monitoring began.

During the 2025 monitoring period, MG-18-1 was successfully sampled in both the spring and fall events. ODWQS exceedances were observed for DOC (spring), TDS (spring), dissolved iron, and dissolved manganese. PWQO exceedances for Dissolved Cobalt were recorded during both sampling events. RUV exceedances were observed for DOC, TDS (spring), dissolved iron, and dissolved manganese. Overall, results remain consistent with historical trends and ongoing leachate characterization at this location.

MG-18-2:

MG-18-2 is a leachate characterization well located along the western edge of the approved footprint. Since monitoring began in 2019, several parameters have consistently exceeded applicable criteria, including boron, cobalt, manganese, and sodium. Additional recurring RUV and ODWQS exceedances have been recorded for alkalinity, TDS, DOC, iron, and manganese.

A new maximum concentration for manganese was recorded during the spring 2024 sampling event. During the fall 2024 event and subsequent Site visits, the well was found damaged and was not sampled.

From historical sampling events, groundwater chemistry at MG-18-2 reflects leachate influence consistent with historical conditions. As MG 18-2 is damaged, a replacement well should be installed to act as a leachate characterization well.

MG-18-3/3R:
Background monitoring well MG-18-3 was historically sampled only once (2019) due to insufficient water levels. Replacement well MG-18-3R was successfully sampled for both 2025 monitoring events. No exceedances of RUV or ODWQS were identified at MG-18-3R in 2025, and results are consistent with background groundwater quality.

VOC Monitoring:
In 2024, VOCs were analyzed at MG-18-1 and MG-18-2 for the spring sampling event. Concentration of benzene and vinyl chloride at MG-18-2 exceeded the ODWQS, but were below PWQO. Benzene exceedances were also identified at this location during both the 2022 events, as well as the fall 2021 and fall 2019 sampling events. VOC exceedances have not been identified at MG-18-1 since monitoring began in 2019. The MECP review comments received in July 2019 indicate that comprehensive VOC sampling shall be conducted at only MG-18-1 and MG-18-2 on a biannual frequency. The next VOC sampling event will occur in 2026.

Bedrock Aquifer Considerations:
It is not currently expected that the bedrock groundwater aquifer is impacted by leachate or is out of compliance with RUVs and Guideline B-7. Due to the wetland surrounding the Site, groundwater is expected to discharge to surface at or before the property line prior to reaching any potential groundwater receptors. Based on this, a bedrock monitoring well is not deemed necessary. In addition, the WDS is considered to be compliant with Guideline B-7.

5.2 Surface Water Assessment

Surface water chemistry results from the two 2025 monitoring events are summarized in Table 17 (end of text). Parameters exceeding PWQO are identified and flagged and MECP Table A and Table B criteria are included for reference only. Historical surface water quality data for the Musclow-Greenview WDS are provided in Appendix E (E-2). Mann-Kendall trend analyses for

select parameters are included in Appendix G, following the tables, figures, and photographs at the end of this report.

MG-SW1:

Surface water monitoring location MG-SW1 is located approximately 90 m north of the waste footprint. During 2025, a sample was collected in the spring; dry conditions prevented fall sampling.

Spring analytical results indicate a PWQO exceedance for total iron. All other parameters at MG-SW1 were below PWQO.

MG-SW2:

MG-SW2 is located approximately 45 m northwest of the toe of the final waste mound. A spring sample was collected in 2025; dry conditions prevented fall sampling.

Spring analytical results show PWQO exceedances for total phosphorus and total iron concentrations. All other parameters were below PWQO.

MG-SW3:

MG-SW3 is located approximately 55 m southwest of the toe of the final waste mound. A spring sample was collected in 2025; dry conditions prevented fall sampling.

Spring results indicate a PWQO exceedance for total boron. All other parameters were below applicable guidelines.

MG-SW4A:

MG-SW4A represents background surface water conditions and is located along Goodkey Creek, approximately 860 m northwest of the final waste footprint. Samples and field duplicates were collected during both spring and fall 2025 monitoring events.

During the spring event, all parameters were below PWQO. During the fall event, PWQO exceedances were reported for phenols, total phosphorus, and total cobalt.

Historically, PWQO exceedances for total iron have occurred routinely during fall sampling events at this location, along with sporadic exceedances of phenols and dissolved aluminum. The former background location (MG-SW4) also exhibited sporadic exceedances of phenols, total phosphorus,

total cadmium, total iron, and total zinc, suggesting seasonal and/or natural variability in background surface water quality.

MG-SW6:
MG-SW6 is located approximately 70 m west of MG-SW3 and 120 m west of the final waste footprint. A spring sample was collected in 2025; dry conditions prevented fall sampling.

Spring results indicate a PWQO exceedance for total phosphorus. All other parameters were below PWQO.

MG-SW7:
MG-SW7 is located approximately 130 m southwest of MG-SW3 and 180 m west of the final waste footprint. Samples were collected during both 2025 monitoring events.

All parameters were below PWQO during the spring event. During the fall event, PWQO exceedances were reported for total phosphorus and total iron.

Overall, surface water quality results indicate that impacts remain localized to monitoring locations immediately downgradient of the WDS, particularly MG-SW2 and MG-SW3, where concentrations above PWQO are generally higher relative to background conditions at MG-SW4A. Total phosphorus, iron, and phenols have historically exceeded PWQO at multiple locations, with the highest concentrations typically observed at MG-SW2 and MG-SW3; however, these parameters are also influenced by wetland-related background conditions and seasonal variability. Continued monitoring is warranted to track boron at MG-SW3 and to confirm that observed exceedances remain stable and localized.

5.3 Landfill Gas Assessment

The RKI Eagle gas monitoring results for 2025 indicated no results of methane gas concentrations above the concentration of concern, 25,000 ppm, for the subsurface.

During both events, monitoring well MG-18-2 was broken and no gas reading was able to be recorded. All other locations had concentrations between 0 and 40 ppm which is well below the concentration of concern. Gas monitoring must be conducted at all groundwater monitoring wells and on-site structures (site attendant's building).

5.4 Mann-Kendall Analysis

A Mann-Kendall trend analysis was conducted for all groundwater and surface water monitoring locations using available data from the past 10 years. The analysis supports interpretation of 2025 results and informs future monitoring programs. A summary of trends for each location is provided below, with the complete analysis presented in **Appendix G.**

Groundwater Monitoring Wells:

MG-18-1: Leachate characterization well (north edge of WDS footprint)
Parameters evaluated: DOC, hardness, TDS, dissolved aluminum (0.45 µm), dissolved cobalt, dissolved iron, dissolved manganese and dissolved zinc.

- DOC: stable trend
- Hardness, TDS, dissolved aluminum, dissolved manganese, dissolved zinc: no discernible trend
- Dissolved cobalt: a probable increasing trend
- Dissolved iron: increasing trend

MG-18-2: Leachate characterization well (west edge of WDS footprint)
Parameters evaluated: alkalinity, DOC, hardness, TDS, dissolved aluminum (0.45 µm), dissolved barium, dissolved boron, dissolved cobalt, dissolved iron, dissolved manganese, dissolved silver, benzene and vinyl chloride.

- Alkalinity: a probable decreasing trend
- DOC, dissolved barium, dissolved iron: stable trend
- Hardness, TDS, dissolved aluminum, benzene: no discernible trend
- Dissolved boron, dissolved cobalt, dissolved manganese: increasing trend
- Dissolved silver, vinyl chloride: insufficient data to establish trend

MG-18-3R: Background Well
Parameters evaluated: TDS, dissolved cobalt, dissolved manganese.

- TDS: stable trend
- Dissolved manganese: decreasing trend
- Dissolved cobalt: insufficient data to establish trend

Drive-Point Piezometers:

MG-DP1: North of WDS
Parameters evaluated: DOC, hardness, TDS, dissolved iron, dissolved manganese and dissolved zinc.

- DOC, dissolved iron: decreasing trend
- Hardness: no discernible trend
- TDS: increasing trend
- Dissolved manganese: stable
- Dissolved zinc: insufficient data to establish trend

MG-DP2: Northwest of WDS toe
Parameters evaluated: DOC, hardness, dissolved boron, dissolved iron and Dissolved manganese.

- DOC: stable trend
- Hardness: no discernible trend
- Dissolved boron, dissolved iron, dissolved manganese: decreasing trend

MG-DP3: West of WDS, beyond property boundary
Parameters evaluated: alkalinity, DOC, hardness, TDS, dissolved boron, , dissolved cobalt, dissolved iron and dissolved manganese.

- Alkalinity, hardness, TDS, dissolved boron, dissolved cobalt, dissolved iron: increasing trend
- DOC: decreasing trend
- Dissolved manganese: no discernible trend

MG-DP4: North of WDS, between MG-DP1 and WDS
Parameters evaluated: DOC, hardness, dissolved aluminum (0.45 µm), dissolved cobalt and dissolved manganese.

- DOC: stable trend
- Hardness, dissolved manganese: decreasing trend
- Dissolved aluminum (0.45 µm): no discernible trend
- Dissolved cobalt: insufficient data to establish trend

MG-DP5: Further west beyond property boundary
Parameters evaluated: DOC, hardness, TDS, dissolved cobalt, dissolved iron, dissolved manganese and dissolved zinc.

- DOC, dissolved cobalt: no trend

- Hardness, TDS: stable trend
- Dissolved iron: increasing trend
- Dissolved manganese: a probable increasing trend
- Dissolved zinc: decreasing trend

Surface Water Monitoring Locations:

MG-SW1: North of waste footprint
Parameters evaluated: Phenols, total phosphorus, dissolved aluminum, total cadmium, total cobalt, total copper, total iron, total lead and total zinc.

- Phenols, total phosphorus, total cobalt, total copper, total Iron, total zinc: no discernable trend
- Dissolved aluminum: stable trend
- Total cadmium, total lead: insufficient data to establish a trend

MG-SW2: Northwest of WDS toe
Parameters evaluated: Phenols, total phosphorus, total cadmium, total cobalt, total iron, total lead, total silver and total zinc.

- Phenols: no discernible trend
- Total Phosphorus, Total Cobalt, Total Iron: decreasing trend
- Total Cadmium, Total Silver: insufficient data to establish a trend
- Total Lead, Total Zinc: stable trend

MG-SW3: Southwest of WDS toe
Parameters evaluated: Phenols, total phosphorus, total boron, total cadmium, total cobalt, total iron, total lead, total vanadium and total zinc.

- Phenols, total cobalt, total lead, total zinc: no discernible trend
- Total phosphorus: a probable decreasing trend
- Total boron: increasing trend
- Total cadmium, total vanadium: insufficient data to establish a trend
- Total iron: decreasing trend

MG-SW4A: Background (Goodkey Creek)
Parameters evaluated: Phenols, total phosphorus, dissolved aluminum, total cobalt and total iron.

- Phenols, dissolved aluminum: stable trend
- Total phosphorus, total iron: no discernible trend

- Total Cobalt: insufficient data to establish a trend

MG-SW6: West of MG-SW3
Parameters evaluated: Phenols, total phosphorus, total cadmium and total iron.

- Phenols, total cadmium: insufficient data to establish a trend
- Total phosphorus: a probable decreasing trend
- Total iron: stable trend

MG-SW7: Southwest of MG-SW3
Parameters evaluated: Phenols, total phosphorus and total iron.

- Phenols, total phosphorus: insufficient data to establish a trend
- Total iron: stable trend

The Mann-Kendall trend analysis for the past 10 years indicates that groundwater and surface water quality at the Musclow-Greenview WDS has generally remained stable, with localized trends reflecting Site-specific influences. Background groundwater at MG-18-3R shows stable TDS and decreasing dissolved manganese, while leachate characterization wells MG-18-1 and MG-18-2 exhibit increasing trends in dissolved iron, cobalt, boron, and manganese, indicating ongoing localized leachate impacts. Among the drive-point piezometers, MG-DP1 and MG-DP2 remain largely stable, whereas MG-DP3 and MG-DP5 show increasing trends for alkalinity, hardness, TDS, and select dissolved metals, suggesting potential shallow groundwater impacts from the WDS. Surface water monitoring locations demonstrate largely stable conditions, with isolated trends including increasing boron at MG-SW3 and decreasing total phosphorus and iron at MG-SW2 and MG-SW3, while background locations such as MG-SW4A remain consistent. Overall, the trend analysis supports that groundwater and surface water continue to reflect minor, localized impacts from site operations, with no widespread deterioration observed, and reinforces the need for continued targeted monitoring at key locations to track potential changes over time.

6 Site Observations

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.

Estimated waste volumes for the Site are provided below in Table 16 and are based on Contractors' tonnages and estimations based on the number of bags deposited at the Site. The tonnages below include recyclables and waste from primarily residential sources in the municipality.

The waste report for 2025 indicates that approximately 23.78 tonnes of recyclables (R) and 208.92 tonnes of waste (W) were deposited in the Musclow-Greenview WDS. The quarterly breakdown is shown below in Table 16. Based on the estimated numbers, a total of 10.22% of residential waste was recycled in 2025. Waste deposited at the Site increased in 2025 by 6.65%. The 2025 numbers also indicate an approximate 6.38% decrease in the recycling of mixed fibres and commingled containers at the Musclow-Greenview WDS from the 2025 waste report.

It should be noted that 2024 and 2025 waste numbers are based on estimates. The 2024 and 2025 waste calculations are based on bag counts at the waste sites. There were 13,928 bags deposited at the Musclow-Greenview WDS in 2025, and an assumed 15 kg/bag (MHH's) was used in the tonnage calculations.

Table 16: Annual Recycling and Waste Tonnages

Q1		Q2		Q3		Q4		Year End	
(R)	(W)	(R)	(W)	(R)	(W)	(R)	(W)	(R)	(W)
2024									
5.8	35.3	6.2	51.9	7.8	60.1	5.7	48.7	**25.4**	**195.9**
2025									
4.80	39.11	6.25	55.44	7.65	64.16	5.1	50.22	**23.78**	**208.92**

In addition, segregated materials were collected at the nine waste disposal/transfer sites in the MHHs. The breakdown of these wastes in 2025 at the Musclow-Greenview site was:

- Scrap metal – 0.0 tonnes;
- Bulky wastes – 0.0 tonnes;
- Leaf and yard waste – 166 truck/trailer loads;
- Electrical and Electronic Equipment – 0.0 tonnes;
- 0 Batteries; and
- 102 tires.

There were no documented complaints for rejected waste at the Musclow-Greenview WDS and there were no emergency situations in 2025.

6.2 Capacity and Remaining Site Life

The approved capacity for the Musclow-Greenview WDS is 27,500 cubic metres (m^3). According to the most recent survey data (November 2022) and the updated 2017 D&O Plan, the current net volume remaining was calculated to be 18,103 m^3, including intermediate cover. The total volume of fill (intermediate cover) required to cover the waste site was calculated at 3,964 m^3. Thus, the volume remaining for waste and daily cover placement was estimated at 14,139 m^3. The remaining capacity of the WDS as of November 9, 2022, is illustrated on Figure 05.

The last five annual monitoring reports for the Site have recorded annual waste generation rates of 138.3 (2021), 160.7 (2022), 179.3 (2023), 195.9 (2024) and 208.92 (2025) tonnes, resulting in an average tonnage of 176.62 tonnes per year. The 176.62 tonnes are estimated to equate to 353.24 m^3 of compacted waste per year (no soil cover), assuming a compaction rate of 500 kg/m^3. Taking the requirement for clean fill to be applied as daily cover between waste layers, soil requirements are assumed to be 25% of the total waste volume. Therefore, the total annual fill rate is expected to be approximately 441.55 m^3 per year.

Based on the current available information and the average fill rate of 441.55 m^3 for the last five years, the life expectancy of the waste site is estimated to be 32 years from the November 2022 survey (i.e., 2054).

A number of factors (e.g., environmental capacity and changes to fill rates) can result in significant changes to the actual life of the Site. Due to the impacts to the wetland, a reduced capacity is likely.

7 Summary Statements, Conclusions, and Recommendations

The following summary statements, conclusions, and recommendations are based on the results of the 2025 monitoring program.

7.1 Groundwater

7.1.1 Drive-Point Piezometers

- It is recommended that the drive-point piezometers continue to be used as a measure of surface water quality not groundwater quality and therefore compared to the surface water criteria for compliance.

- An increasing trend in alkalinity, hardness, TDS, dissolved boron, cobalt, and iron is confirmed at MG-DP3. Dissolved boron continues to exceed the interim PWQO (while remaining below ODWS, and a corresponding increasing trend in total boron is also observed at MG-SW3. These results support that shallow groundwater near MG-DP3 has the potential to influence surface water quality at MG-SW3, warranting continued monitoring.
- At MG-DP5, dissolved iron shows an increasing trend and dissolved manganese shows a probable increasing trend, while hardness and TDS remain stable and zinc is decreasing. Although the dataset is more limited than long-term wells, the upward metal trends suggest localized downgradient influence potentially associated with the WDS. Continued monitoring is recommended to confirm persistence of these trends.
- To address potential impacts at MG-DP3 and MG-DP5, it is recommended that the Municipality plan for an assessment of the development of the Site based on this new data. Based on the results at MG-DP5 it is recommended that MG-SW6 continue to be sampled semi-annually in the surface water monitoring program.

7.1.2 Groundwater Monitoring Wells

- MG-18-2 is broken at approximately 2.2 m below ground surface. It is recommended that this leachate characterization well be replaced in order to continue to monitor the impacts on the west side of the Site.
- Groundwater adjacent to the WDS continues to be impacted by the Site.
- In accordance with MECP (July 2019) direction, comprehensive VOC sampling at MG-18-1 and MG-18-2 will continue on a biennial basis, with the next event scheduled for 2026.
- A replacement background monitoring well, MG-18-3R was installed in September 2023, directly adjacent to the original background monitoring well MG-18-3, in response to the MECP indicating that if MG-18-3 continued to be dry that an alternate background monitoring well may be required (MECP, July 2019).
- Groundwater is expected to discharge to surface at or before the property line and therefore it is expected that groundwater downgradient from the WDS property boundary is not being impacted by leachate and is compliant with Guideline B-7.
- It is not currently expected that the bedrock groundwater aquifer is impacted by leachate based on the above interpretation. Based on this, a bedrock monitoring well is not deemed necessary.

7.2 Surface Water

- Surface water in the wetland adjacent to the WDS continues to be impacted by the Site.
- Historically, concentrations of parameters above PWQO are generally higher for surface water sampling locations MG-SW2 (mid-stream) and MG-SW3 (downstream) when compared to upstream location MG-SW1. The concentrations of certain parameters above the PWQO at surface water locations indicate there are impacts from Site operations to the surface water in the immediate vicinity of the WDS.
- Surface water results at MG-SW3 from 2018 to 2025 indicate an increasing trend in total boron. Continued monitoring is required to further assess this upward trend. No other surface water monitoring locations exhibited increasing trends over the review period.
- Surface water monitoring should continue at five locations on a semi-annual basis for the Musclow-Greenview site. It is recommended that MG-SW4A continue to be sampled as the background location, replacing prior background locations MG-SW4 and MG-SW5. It is recommended that Site visits be made during the wet seasons in the spring and fall of 2026 to obtain the most representative samples.
- MG-SW6 should continue to be sampled on a semi-annual basis based on historical results at MG-DP5.
- Surface water location MG-SW7 should continue to be sampled every five years (e.g., 2025, 2030).
- Surface water samples should continue to be collected by peristaltic pump to avoid introducing organic matter into samples collected from shallow conditions.

7.3 Landfill Gas

- Landfill gas readings were collected from all available monitoring wells and drive-point piezometers during both sampling events in 2025. During both events monitoring well MG-18-2 was broken and no gas reading was able to be recorded. All other locations had concentrations between 0 and 40 ppm which are levels well below the applicable Regulation 232/98 limit of 25,000 ppm for methane in the subsurface.
- Landfill gas monitoring at all monitoring wells and the attendant's building should be continued during the 2026 semi-annual monitoring program.

7.4 Site Operations

- Site operations and the order and management of debris have greatly improved during recent years at the Musclow-Greenview WDS. The Municipality should continue these efforts.
- Construction of berms was initiated in 2016 to define locations for segregated materials. Materials should be removed at a frequency to maintain good segregation of metal, tires, and bulky items into the appropriately signed designated areas. The berms should also assist in reducing surface water contact with waste and the potential impacts site run-off may have on adjacent surface water bodies.
- Interim/daily cover should be applied on a regular basis to reduce the wind-blown litter around the site.
- It is recommended that waste transferred to the Site continue to be accounted for and documented by tracking the number of bags/vehicles deposited at the Site. Detailed descriptions and quantities of rejected waste should continue to be documented for the Musclow-Greenview WDS.
- Public education with respect to waste reduction and recycling should be an on-going effort by the Municipality, including reminders on the local collection points for household hazardous waste and electronic waste.

7.5 Landfill Capacity

- Based on the current available information and the average fill rate of 441.55 m^3 for the last five years, the life expectancy of the waste site is estimated to be 32 years from the November 2022 survey (i.e., 2054).
- A number of factors (e.g., environmental capacity and changes to fill rates) can result in significant changes to the actual life of the Site.

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.



Oscar Fisher, B.Eng.
Engineering Intern

Jaclyn Kalesnikoff, B.Sc., P.Geo.
Senior Hydrogeologist

9 References

BluMetric 2017, Development and Operations Plan Musclow Greenview WDS, The Corporation of the Township of Hastings Highlands, November 2017.

BluMetric, 2017 Annual Monitoring Report Musclow Greenview WDS, The Corporation of the Municipality of Hasting Highlands, February 2017.

Canadian Council of Ministers of the Environment (CCME), 1993. Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites. Volume 1: Main Report CCME EPC-NCS62E.

Groundwater Information Network, http://gw-info.net/ October 21, 2015.

Ministry of Northern Development and Mines (MNDM), Map 2544, 1991.

Ministry of Northern Development and Mines (MNDM), Map 2556, 1991.

MOE, 1998. Landfill Standards – A Guideline on the Regulatory and Approval Requirements for New and Expanding Landfill Sites. Queen's Printer for Ontario 127pp.

MOE, 1999. Provincial Water Quality Objectives.

Moore, T.R. DOC in Northern Boreal Landscape, Global Biochemical Cycles, Vol. 17, No. 4, December 4, 2003.

http://geog.mcgill.ca/faculty/moore/Global%20BiogeochemCycles_%2017_2050.pdf.

Tables

Hastings Highlands Analytical Chemistry Results: Table 17 - 2025 Groundwater Quality						Location	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-3R	MG-18-3R	MG-DP1	MG-DP1
						Sample ID	MG-18-1	MG-QAQC-GW1 (MG-18-1)	MG-18-1	MG-QAQC-GW1 (MG-18-1)	MG-18-3R	MG-18-3R	MG-DP1	MG-DP1
Parameter	Units	ODWQS-ALL-MERGED	RUV-MG	PWQO-INTERIM	PWQO-GENERAL	Sample Date	2025-May-05	2025-May-05	2025-Oct-16	2025-Oct-16	2025-May-05	2025-Oct-16	2025-May-05	2025-Oct-16
						Sample Depth	-	-	-	-	-	-	-	-
Anions						Detection Limit								
Chloride	mg/L	250	125.25	-	-	1	92	91	56	54	2	<1	38	40
Nitrate as N	mg/L	10	2.5375	-	-	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sulphate	mg/L	500	253.575	-	-	1	13	13	16	16	6.2	8.3	92	98
Cations														
Calcium (diss)	mg/L	-	-	-	-	0.2	85	86	60	61	24	21	140	130
Magnesium (diss)	mg/L	-	-	-	-	0.05	20	20	15	15	1.5	1.3	11	10
Sodium (diss)	mg/L	200	101.5	-	-	0.1	25	25	24	24	3.1	2.8	13	14
General Chemistry														
Alkalinity (as CaCO3)	mg/L	30 - 500	47.75 - 282.75	-	See Factsheet	1	220	220	170	160	70	62	240	240
Ammonia as N	mg/L	-	-	-	-	0.05	0.14	0.14	0.2	0.14	<0.05	<0.05	0.24	0.29
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	9.2	11	<4	<4	<4	<4	7.5	10
Dissolved Organic Carbon	mg/L	5	3.475	-	-	0.4	5.8	5.7	4.1	4	1.3	1.9	5.2	9.1
Electrical Conductivity	uS/cm	-	-	-	-	2	760	770	560	560	150	130	780	760
pH	pH units	6.5 - 8.5	6.9275 - 7.9275	-	6.5 - 8.5		7.35	7.48	7.37	7.57	7.48	7.32	7.99	7.77
Total Dissolved Solids	mg/L	500	390	-	-	10	500	535	205	340	120	220	540	465
Total Suspended Solids	mg/L	-	-	-	-	10	8600	8000	2900	6000	11000	5600	<10	<10
Metals														
Aluminum (diss, 0.45 µm)	mg/L	0.1	0.051225	Calculated	-	0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	0.0094	<0.0049	<0.0049
Barium (diss)	mg/L	1	0.262	-	-	0.002	0.093	0.09	0.068	0.069	0.019	0.013	0.073	0.075
Boron (diss)	mg/L	5	1.25563	0.2	-	0.01	0.13	0.13	0.15	0.15	<0.01	<0.01	0.057	0.06
Cadmium (diss)	mg/L	0.005	0.0012837	Calculated	-	0.00009	<0.00009	<0.00009	0.000095	0.00011	<0.00009	<0.00009	<0.00009	<0.00009
Chromium (diss)	mg/L	0.05	0.014375	-	-	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	**0.033**	**0.033**	**0.021**	**0.022**	<0.0005	<0.0005	<0.0005	<0.0005
Iron (diss)	mg/L	0.3	0.175	-	0.3	0.1	0.67	0.67	0.35	0.35	<0.1	<0.1	<0.1	<0.1
Lead (diss)	mg/L	0.01	0.0026875	Calculated	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.05	0.04075	-	-	0.002	5.8	5.8	4.1	4.2	0.035	0.0047	0.14	0.13
Silver (diss)	mg/L	-	-	-	0.0001	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Zinc (diss)	mg/L	5	2.50125	0.02	-	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 ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds RUV-MG	Reasonable Use Values Musclow Greenview
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General

Hastings Highlands Analytical Chemistry Results: Table 17 - 2025 Groundwater Quality						Location	MG-DP2	MG-DP2	MG-DP3	MG-DP3	MG-DP4	MG-DP4	MG-DP5	MG-DP5
						Sample ID	MG-DP2	MG-DP2	MG-DP3	MG-DP3	MG-DP4	MG-DP4	MG-DP5	MG-DP5
Parameter	Units	ODWQS-ALL-MERGED	RUV-MG	PWQO-INTERIM	PWQO-GENERAL	Sample Date	2025-May-05	2025-Oct-16	2025-May-05	2025-Oct-16	2025-May-05	2025-Oct-16	2025-May-05	2025-Oct-16
						Sample Depth	-	-	-	-	-	-	-	-
Anions						Detection Limit								
Chloride	mg/L	250	125.25	-	-	1	1.9	<1	74	90	5.6	3.5	57	49
Nitrate as N	mg/L	10	2.5375	-	-	0.1	<0.1	<0.1	<0.1	<0.1	0.14	<0.1	<0.1	0.11
Sulphate	mg/L	500	253.575	-	-	1	1.5	4.6	32	32	12	14	40	39
Cations														
Calcium (diss)	mg/L	-	-	-	-	0.2	48	43	270	250	33	31	120	160
Magnesium (diss)	mg/L	-	-	-	-	0.05	4.1	3.7	36	37	5.1	4.8	11	15
Sodium (diss)	mg/L	200	101.5	-	-	0.1	4.8	4	59	66	4.8	4.6	7.8	10
General Chemistry														
Alkalinity (as CaCO3)	mg/L	30 - 500	47.75 - 282.75	-	See Factsheet	1	220	160	750	710	98	88	310	360
Ammonia as N	mg/L	-	-	-	-	0.05	6.2	5.8	0.14	0.57	<0.05	<0.05	0.085	0.16
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<2	32	40	6	5
Chemical Oxygen Demand	mg/L	-	-	-	-	4	21	20	28	24	40	55	41	23
Dissolved Organic Carbon	mg/L	5	3.475	-	-	0.4	19	17	10	23	5.3	4.9	11	10
Electrical Conductivity	uS/cm	-	-	-	-	2	340	320	1600	1600	240	220	820	890
pH	pH units	6.5 - 8.5	6.9275 - 7.9275	-	6.5 - 8.5		7.77	7.27	7.14	7.32	8.21	7.8	7.23	7.15
Total Dissolved Solids	mg/L	500	390	-	-	10	175	110	955	945	125	135	510	620
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	20	<10	240	130	310	170
Metals														
Aluminum (diss, 0.45 µm)	mg/L	0.1	0.051225	Calculated	-	0.0049	<0.0049	<0.0049	<0.0049	<0.0049	0.0062	<0.0049	<0.0049	<0.0049
Barium (diss)	mg/L	1	0.262	-	-	0.002	0.032	0.03	0.19	0.22	0.013	0.012	0.037	0.057
Boron (diss)	mg/L	5	1.25563	0.2	-	0.01	0.028	0.03	**0.62**	**0.75**	0.018	0.014	0.06	0.1
Cadmium (diss)	mg/L	0.005	0.0012837	Calculated	-	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Chromium (diss)	mg/L	0.05	0.014375	-	-	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	<0.0005	**0.0055**	**0.0035**	<0.0005	<0.0005	**0.031**	**0.046**
Iron (diss)	mg/L	0.3	0.175	-	0.3	0.1	<0.1	<0.1	0.61	0.47	<0.1	<0.1	170	55
Lead (diss)	mg/L	0.01	0.0026875	Calculated	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.05	0.04075	-	-	0.002	0.071	0.064	0.43	0.42	<0.002	<0.002	1.9	2
Silver (diss)	mg/L	-	-	-	0.0001	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Zinc (diss)	mg/L	5	2.50125	0.02	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	32	63

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds ODWQS-ALL-MERGED	Ontario Drinking Water Quality Standards All Types Merged
Concentration exceeds RUV-MG	Reasonable Use Values Musclow Greenview
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General

Hastings Highlands Analytical Chemistry Results: Table 18 - 2025 Surface Water Quality							Location	MG-SW1	MG-SW2	MG-SW3	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A
							Sample ID	MG-SW1	MG-SW2	MG-SW3	MG-SW4A	MG-QAQC-SW1 (MG-SW4A)	MG-SW4A	MG-QAQC-SW1 (MG-SW4A)
Parameter	Units	Max Concentration	PWQO-INTERIM	PWQO-GENERAL	MECP-GD-TA	MECP-GD-TB	Sample Date	2025-May-05	2025-May-05	2025-May-05	2025-May-05	2025-May-05	2025-Oct-16	2025-Oct-16
							Sample Depth	-	-	-	-	-	-	-
Anions							Detection Limit							
Chloride	mg/L	42	-	-	180	128	1	19	34	42	4.4	4.1	9.3	8.8
Nitrate + Nitrite	mg/L	2.31	-	-	-	-	0.1	<0.1	<0.1	2.31	<0.1	<0.1	<0.1	<0.1
Nitrate as N	mg/L	2.28	-	-	-	-	0.1	<0.1	<0.1	2.28	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/L	0.032	-	-	-	-	0.01	<0.01	<0.01	0.032	<0.01	<0.01	<0.01	<0.01
Sulphate	mg/L	100	-	-	100	-	1	29	18	100	5.5	5.4	2.4	2.4
Cations														
Calcium (tot)	mg/L	150	-	-	-	-	0.2	51	83	150	11	11	21	21
Magnesium (tot)	mg/L	23	-	-	-	-	0.05	2	13	23	1.6	1.6	3.4	3.5
Potassium (tot)	mg/L	12	-	-	-	-	0.2	1.2	10	12	0.84	0.83	2.1	2.2
Sodium (tot)	mg/L	42	-	-	-	-	0.1	16	20	42	2.8	2.7	4.3	4.4
Field Parameters														
pH (Field)	pH units	7.4	-	-	-	-		7.14	7.18	7.4	6.99	6.99	6.96	6.96
Temperature	deg. C	15.2	-	-	-	-		11.5	15.2	11.4	11.4	11.4	4.3	4.3
General Chemistry														
Alkalinity (as CaCO3)	mg/L	400	-	See Factsheet	-	-	1	120	200	400	32	32	56	56
Ammonia as N	mg/L	1.6	-	-	-	-	0.05	0.057	1.6	0.23	<0.05	<0.05	0.052	0.054
Biochemical Oxygen Demand	mg/L	<2	-	-	-	-	2	<2	<2	<2	<2	<2	2	2
Chemical Oxygen Demand	mg/L	43	-	-	-	-	4	23	4.1	43	14	15	21	20
Electrical Conductivity	uS/cm	1100	-	-	-	-	2	360	540	1100	92	91	150	150
Hardness (as CaCO3)	mg/L	490	-	-	-	-	1	150	230	490	39	39	62	61
pH	pH units	7.84	-	6.5 - 8.5	6 - 9	-		7.65	7.6	7.84	7.46	7.43	7.31	7.27
Phenols	mg/L	0.0012	-	0.001	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	0.001
Total Dissolved Solids	mg/L	700	-	-	-	-	10	250	345	700	90	100	100	90
Total Kjeldahl Nitrogen	mg/L	2.2	-	-	-	-	0.1	0.44	2.2	0.9	0.27	0.24	0.48	0.42
Total Phosphorus	mg/L	0.063	-	0.02	-	-	0.02	<0.02	0.045	<0.02	<0.02	<0.02	0.063	0.05
Total Suspended Solids	mg/L	22	-	-	-	-	10	<10	16	<10	<10	<10	22	<10
Unionized Ammonia (Calc)	mg/L	0.0081	-	-	-	-	0.00061	<0.00061	0.0081	0.0015	<0.00061	<0.00061	<0.00061	<0.00061
Metals														
Aluminum (diss, 0.2 µm)	mg/L	0.033	Calculated	-	-	-	0.005	0.013	<0.005	0.007	0.033	0.031	0.031	0.03
Barium (tot)	mg/L	0.11	-	-	2.3	-	0.002	0.032	0.069	0.11	0.012	0.011	0.023	0.022
Boron (tot)	mg/L	0.98	0.2	-	3.55	1.5	0.01	<0.01	0.2	0.98	<0.01	0.014	<0.01	<0.01
Cadmium (tot)	mg/L	<0.00009	Calculated	-	0.00021	0.000017	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Cobalt (tot)	mg/L	0.0011	0.0009	-	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00093	0.0011
Copper (tot)	mg/L	0.0032	Calculated	-	0.0069	-	0.0009	0.0016	0.0032	0.0014	<0.0009	<0.0009	<0.0009	<0.0009
Iron (tot)	mg/L	3.5	-	0.3	1	-	0.1	0.55	3.5	0.16	0.12	0.12	3.4	2.9
Lead (tot)	mg/L	<0.0005	Calculated	-	0.002	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (tot)	mg/L	0.51	-	-	-	-	0.002	0.087	0.51	0.051	0.0064	0.0061	0.46	0.45
Zinc (tot)	mg/L	<0.005	0.02	-	0.089	0.03	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-

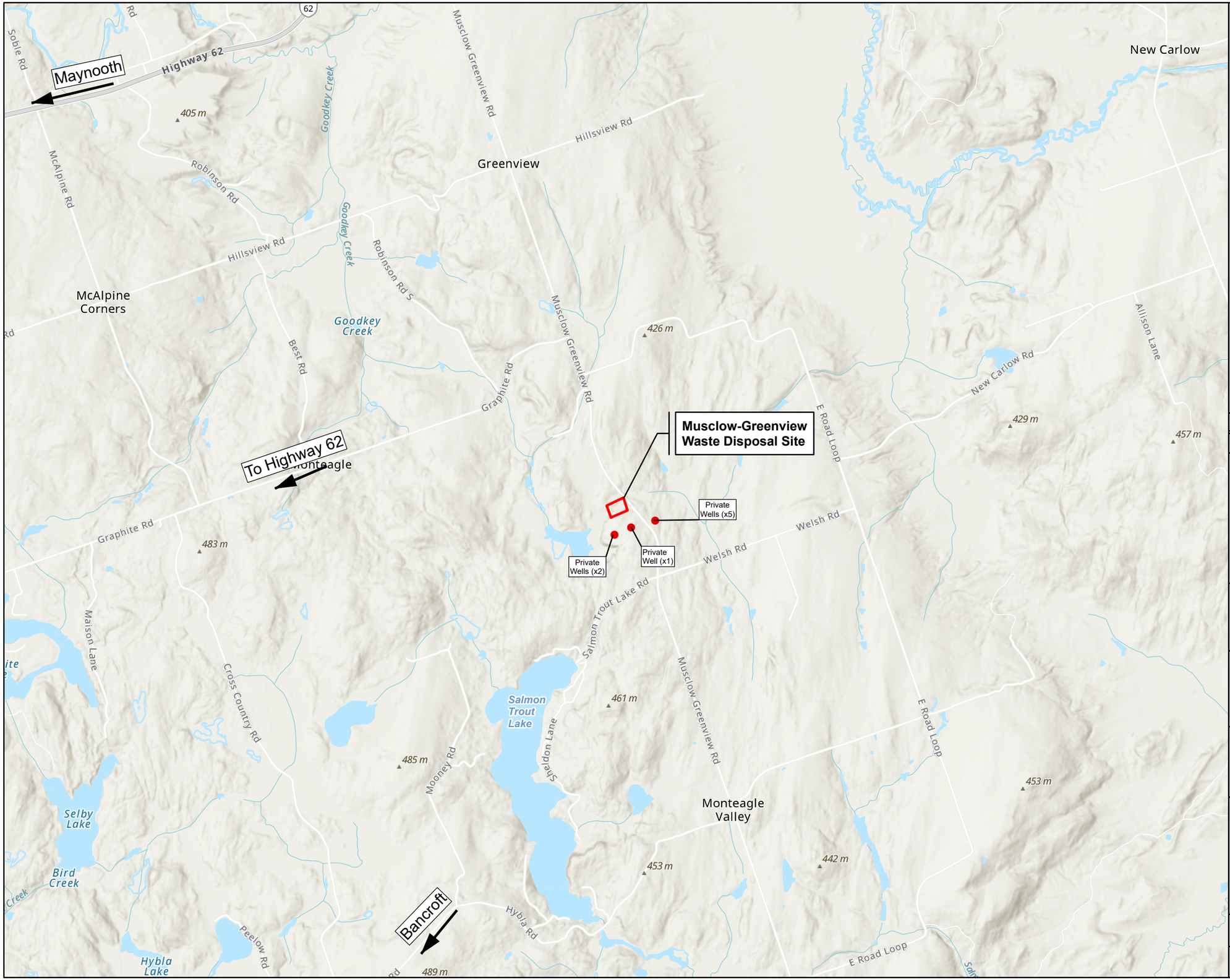
Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B

Hastings Highlands Analytical Chemistry Results: Table 18 - 2025 Surface Water Quality							Location	MG-SW6	MG-SW7	MG-SW7
							Sample ID	MG-SW6	MG-SW7	MG-SW7
Parameter	Units	Max Concentration	PWQO-INTERIM	PWQO-GENERAL	MECP-GD-TA	MECP-GD-TB	Sample Date	2025-May-05	2025-May-05	2025-Oct-16
							Sample Depth	-	-	-
Anions							Detection Limit			
Chloride	mg/L	42	-	-	180	128	1	13	<1	4.5
Nitrate + Nitrite	mg/L	2.31	-	-	-	-	0.1	<0.1	<0.1	<0.1
Nitrate as N	mg/L	2.28	-	-	-	-	0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/L	0.032	-	-	-	-	0.01	<0.01	<0.01	<0.01
Sulphate	mg/L	100	-	-	100	-	1	9.2	8.3	10
Cations										
Calcium (tot)	mg/L	150	-	-	-	-	0.2	29	8.3	34
Magnesium (tot)	mg/L	23	-	-	-	-	0.05	2.9	1	3.8
Potassium (tot)	mg/L	12	-	-	-	-	0.2	2	0.36	2.2
Sodium (tot)	mg/L	42	-	-	-	-	0.1	8.3	1.8	3.9
Field Parameters										
pH (Field)	pH units	7.4	-	-	-	-		7.4	6.49	7.29
Temperature	deg. C	15.2	-	-	-	-		12.1	9.2	5
General Chemistry										
Alkalinity (as CaCO3)	mg/L	400	-	See Factsheet	-	-	1	77	21	88
Ammonia as N	mg/L	1.6	-	-	-	-	0.05	<0.05	<0.05	0.13
Biochemical Oxygen Demand	mg/L	<2	-	-	-	-	2	<2	<2	<2
Chemical Oxygen Demand	mg/L	43	-	-	-	-	4	15	10	9
Electrical Conductivity	uS/cm	1100	-	-	-	-	2	220	67	210
Hardness (as CaCO3)	mg/L	490	-	-	-	-	1	93	28	96
pH	pH units	7.84	-	6.5 - 8.5	6 - 9	-		7.71	6.98	7.63
Phenols	mg/L	0.0012	-	0.001	0.04	0.004	0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	700	-	-	-	-	10	155	65	145
Total Kjeldahl Nitrogen	mg/L	2.2	-	-	-	-	0.1	0.29	0.21	0.38
Total Phosphorus	mg/L	0.063	-	0.02	-	-	0.02	0.025	<0.02	0.05
Total Suspended Solids	mg/L	22	-	-	-	-	10	<10	<10	22
Unionized Ammonia (Calc)	mg/L	0.0081	-	-	-	-	0.00061	<0.00061	<0.00061	<0.00061
Metals										
Aluminum (diss, 0.2 µm)	mg/L	0.033	Calculated	-	-	-	0.005	<0.005	0.03	0.006
Barium (tot)	mg/L	0.11	-	-	2.3	-	0.002	0.016	0.0063	0.025
Boron (tot)	mg/L	0.98	0.2	-	3.55	1.5	0.01	0.031	<0.01	<0.01
Cadmium (tot)	mg/L	<0.00009	Calculated	-	0.00021	0.000017	0.00009	<0.00009	<0.00009	<0.00009
Cobalt (tot)	mg/L	0.0011	0.0009	-	-	-	0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	0.0032	Calculated	-	0.0069	-	0.0009	<0.0009	<0.0009	<0.0009
Iron (tot)	mg/L	3.5	-	0.3	1	-	0.1	<0.1	0.11	3.4
Lead (tot)	mg/L	<0.0005	Calculated	-	0.002	-	0.0005	<0.0005	<0.0005	<0.0005
Manganese (tot)	mg/L	0.51	-	-	-	-	0.002	0.017	0.0065	0.22
Zinc (tot)	mg/L	<0.005	0.02	-	0.089	0.03	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-INTERIM	Provincial Water Quality Objectives Interim
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B

Figures



LEGEND

- Waste Disposal Site
- Private Wells Within 500m of the Site

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 Hasting Highlands

PROJECT

Musclow – Greenview 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		
250253-07	**March 06, 2026**		
DRAWN	CHECKED	FIG NO.	REV
PB	**OF**	**01**	**0**



LEGEND

- Approximate Property Outline (2 ha)
- Site Features
- Final Footprint Design (0.87 ha)
- Abandoned Monitoring Well
- Groundwater Monitoring Location
- Benchmark
- Surface Water Sampling Locations
- Supplemental Surface Water Sampling Locations
- Historical Surface Water Sampling Locations

NOTES:
Imagery taken on July 9th 2024

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

1:1,000

CLIENT

Municipality of Hasting Highlands

PROJECT

Musclow – Greenview Waste Disposal Site

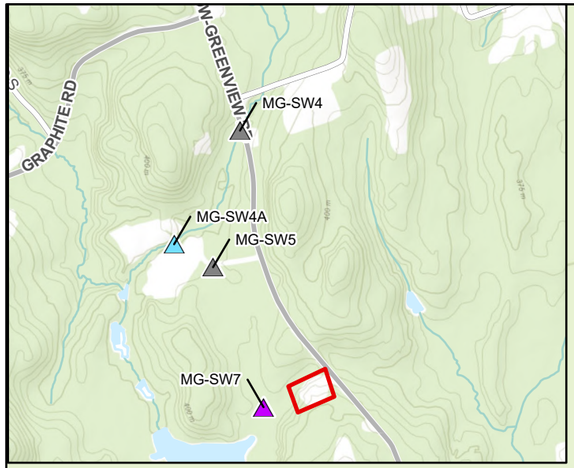
TITLE

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
250253-07	March 06, 2026

DRAWN	CHECKED	FIG NO.	REV
PB	OF	02	0



MG-SW1
MG-DP1
MG-DP4
MG-BM-01
Bulky Waste
Metals
Tires
Brush and Leaf
MG-DP2
MG-SW2
MG 18-3R
383.11
MG-18-3
MG-18-1
379.74
Property Boundary (2 ha)
Attendant's Building
Recycling Bins
Electrical and Electronic Equipment
Final Footprint Design (0.65 ha)
MG-18-2
MG-DP5
375.8
MG-SW6
MG-SW3
MG-DP3
MG-SW7
DRAINAGE SWALE ALONG SOUTH SIDE OF FINAL DESIGN FOOTPRINT
MUSCLOW-GREENVIEW RD
385 m
380 m
375 m
400 m

LEGEND

- Approximate Property Outline (2 ha)
- Site Features
- Final Footprint Design (0.87 ha)
- Treeline
- Groundwater Monitoring Well
- Abandoned Monitoring Well
- Benchmark
- Historical Surface Water Sampling Locations;
- Supplemental Surface Water Sampling Locations
- Surface Water Sampling Locations
- Inferred Ground Water Flow Direction
- 380.64 Groundwater Elevation (Spring, 2025)
- Water Elevation Contour

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

1:1,000

CLIENT

Municipality of Hasting Highlands

PROJECT

Musclow – Greenview Waste Disposal Site

TITLE

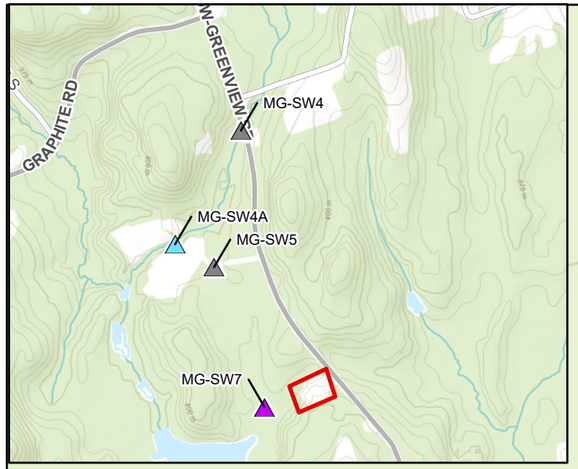
Groundwater Elevations - Spring 2025

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
250253-07	March 06, 2026

DRAWN	CHECKED	FIG NO.	REV
PB	OF	03	0

C:\SP\BluMetric Environmental\Geomatics - GIS\GIS_PROJECTS\PROJECTS\MHH\Projects\250253 - 2025 AMR\07-Musclow-Greenview\APRX\2026-03-06\250253-MHH-MusclowGreenview.aprx



MG-SW1
MG-DP1
MG-DP4
MG-BM-01
MG-DP2
MG-SW2
Bulky Waste
Metals
Tires
Brush and Leaf
MG 18-3R
378.96
MG-18-3
MG-18-1
377.15
-378.5
-378
-377.5
-377
-376.5
-376
Property Boundary (2 ha)
Attendant's Building
Recycling Bins
Electrical and Electronic Equipment
Final Footprint Design (0.65 ha)
MG-18-2
MG-DP5
375.27
MG-SW6
MG-SW3
MG-DP3
MG-SW7
DRAINAGE SWALE ALONG SOUTH SIDE OF FINAL DESIGN FOOTPRINT
MUSCLOW-GREENVIEW RD
3375
385 m
380 m
395 m
400 m

LEGEND

- Approximate Property Outline (2 ha)
- Site Features
- Final Footprint Design (0.87 ha)
- Treeline
- Groundwater Monitoring Well
- Abandoned Monitoring Well
- Benchmark
- Historical Surface Water Sampling Locations;
- Supplemental Surface Water Sampling Locations
- Surface Water Sampling Locations
- Inferred Ground Water Flow Direction
- 380.64 Groundwater Elevation (Fall, 2025)
- Water Elevation Contour

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

1:1,000

CLIENT

Municipality of Hasting Highlands

PROJECT

Musclow – Greenview Waste Disposal Site

TITLE

Groundwater Elevations - Fall 2025

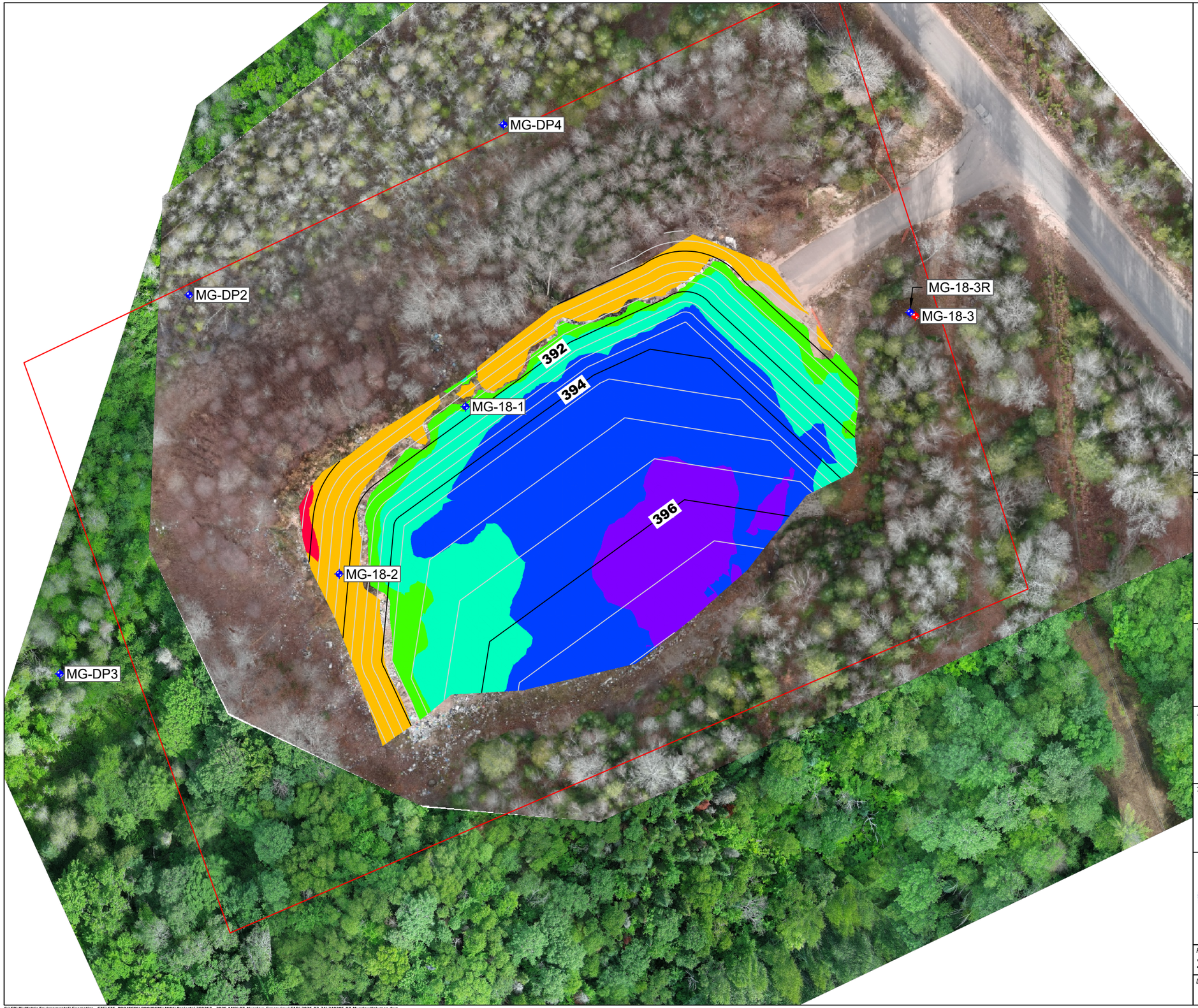
BluMetric Environmental

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
250253-07	March 06, 2026

DRAWN	CHECKED	FIG NO.	REV
PB	OF	04	0

C:\SP\BluMetric Environmental\Geomatics - GIS\GIS_PROJECTS\PROJECTS\MHH\Projects\250253 - 2025 AMR\07-Musclow-Greenview\APRX\2026-03-06\250253-MHH-MusclowGreenview.aprx



LEGEND

- Monitoring Well Location
- Abandoned Monitoring Well Location
- Approximate Property Outline (2 ha)
- Final Elevation Contour (0.5 m)
- Final Elevation Contour (2.0 m)

Volume to Remove (Cut): 1,162 m³
Volume to be Added (Fill): 18,130 m³
Volume of Intermediate Cover: 3,800 m³
Net Volume to be Added (Netfill): 16,967 m³

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Volume	Color
1	−4.08	−3.00	11	
2	−3.00	−0.25	906	
3	0.25	1.00	3800	
4	1.00	3.00	8182	
5	3.00	5.00	4549	
6	5.00	5.90	266	

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 15 30 Metres
1:750

N W E S

CLIENT

Municipality of Hastings Highlands

PROJECT

Musclow-Grenview Waste Disposal Site

TITLE

Remaining Fill Capacity as of July 7th, 2024

BluMetric™ Environmental
1682 Woodward Drive
Ottawa, Ontario, K2C 3R8
TEL: (613) 839-3053
FAX: (613) 839-5376
Email: info@blumetric.ca
Web: http://www.blumetric.ca

PROJECT #	DATE
250253-07	February 24, 2026

DRAWN	CHECKED	DWG NO.	REV
PB	OF	05	0

C:\SP\BluMetric Environmental\Geomatics - GIS\GIS_PROJECTS\PROJECTS\MHH\Projects\250253 - 2025 AMR\07-Musclow-Greenview\CAD\2026-02-24\240205-07-MusclowVolumes.dwg

Site Photographs



Photo 1: Front entrance with signage – May 5, 2025



Photo 2: Front entrance with signage – May 5, 2025



Photo 3: Attendant's building and recycling depot – May 5, 2025



Photo 4: Brush and yard waste – May 5, 2025



Photo 5: Segregated metals – May 5, 2025



Photo 6: Segregated tires – May 5, 2025



Photo 7: Bulk waste area – May 5, 2025



Photo 8: Active waste area– May 5, 2025



Photo 9: MG-SW1 monitoring location – May 5, 2025



Photo 10: MG-SW2 monitoring location – May 5, 2025



Photo 11: MG-SW3 monitoring location – May 5, 2025



Photo 12: MG-SW4A monitoring location – May 5, 2025



Photo 13: MG-SW6 (a) monitoring location – May 5, 2025



Photo 14: MG-SW6 (b) monitoring location – May 5, 2025



Photo 15: MG-SW7 (a) monitoring location – May 5, 2025



Photo 16: MG-SW7 (b) monitoring location – May 5, 2025



Photo 17: Front entrance with signage – October 16, 2025



Photo 18: Attendant's building and recycling depot – October 16, 2025



Photo 19: Northeast view of site (a) – October 16, 2025



Photo 20: Northeast view of site (b) – October 16, 2025



Photo 21: Segregated metals – October 16, 2025



Photo 22: Segregated tires – October 16, 2025



Photo 23: Bulk waste area – October 16, 2025



Photo 24: Brush and yard waste – October 16, 2025



Photo 25: Segregated waste piles–
October 16, 2025



Photo 26: Attendant's building –
October 16, 2025



Photo 27: MG-SW1 monitoring location –
October 16, 2025



Photo 28: MG-SW2 monitoring location –
October 16, 2025



Photo 29: MG-SW3 monitoring location – October 16, 2025



Photo 30: MG-SW4A monitoring location – October 16, 2025



Photo 31: MG-SW6 monitoring location – October 16, 2025



Photo 32: MG-SW7 monitoring location – October 16, 2025

Appendix A

A-1 Environmental Compliance Approval

Content Copy Of Original

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A362303
Issue Date: October 24, 2019

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

Site Location: Musclow-Greenview WDS
3375 Musclow-Greenview Road
Lot Part of 11, Concession 11
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 1 hectare waste disposal/transfer site within a total site area of 2 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;
- *"HHW"* means household hazardous waste;
- *"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 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 Musclow-Greenview WDS, 3375 Musclow-Greenview Road; 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) Within one-hundred and eighty (180) 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 thirty (30) 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.

Inspections by the *Ministry*

(16) 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

(17) (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 "A" 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 the *Ministry* staff.

(18) 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.

(19) 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.

(20) 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 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's* 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:

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

Saturday : 7:00 a.m. - 12:00 p.m.

Sunday : 12:00
p.m. - 5:00 p.m.
Statutory Holiday
Monday : 12:00
p.m. - 5:00 p.m.

(8) On-site equipment used for daily site preparation and closing activities may be operated one (1) hour before and one (1) hour after the hours of operation approved by this *Approval.*
(9) With the prior written approval from the *District Manager,* the time periods may be extended to accommodate seasonal or unusual quantities of waste.

Site Security

(10) (a) 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.

(b) Waste/recyclables relocated on-site or removed from the *Site* by a registered/licensed waste hauler shall be carried out by trained personnel during the hours of 7 a.m. and 5 p.m. Monday to Friday.

(11) 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 *Regulation 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 and total annual quantity (volume or 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 *Regulation* 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) The approved volumetric capacity of the *Site,* consisting of the waste, daily cover and intermediate cover, but excluding the final cover is 27,500 cubic metres.
(5) This approval is for the design, operation and use of 27,500 cubic meters as described in the Development and Operations Plan dated November 2017 prepared by BlueMetric Environmental included in Schedule "A". This volume includes the historical waste volume of 11,680 cubic meters as of July 2017.

Service Area

(6) Only waste that is generated within the boundaries of the Municipality of Hastings Highlands may be accepted at the *Site.*
(7) Waste from Universal Seal Incorporated shall not be deposited at the *Site.*

Cover

(8) 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 *Regulation 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.

(9) Cover material shall be applied as follows:

(a) **Periodic Cover** - Weather permitting, deposited waste shall be covered **at the end of each third week** in a manner acceptable to the *District Manager* so that no waste is exposed to the atmosphere. If this frequency creates nuisance effects the *Owner* shall apply more frequent cove as directed by the *District Manager;*
(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.

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,* as amended from time to time or limits set by the Regional Director, for the protection of the groundwater at and off the *Site.*

Surface Water and Groundwater

(3) The *Owner* shall monitor surface water and ground water in accordance with Schedules "B" and "C".

(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) Trigger mechanisms shall be in accordance with Appendix F (revised March 13, 2018), the Development and Operations Plan dated November 2017 prepared by BlueMetric Environmental included in Schedule "A".
(9) The *Owner* shall revise the trigger mechanisms and contingency plans in consultation with the *District Manager.* By March 2022, the *Owner* shall submit to the *Director,* an application to amend the existing trigger mechanisms and 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.

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 Ontario Regulation 189/94 (O. Reg. 189/94); 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. 189/94.

(3) 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.

(4) 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.
(5) 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 June 21, 1989.
2. Letter from J.W. Tooley, MOE, to E.N. Tulley, Township of Monteagle, dated November 21, 1989.
3. Letter from E.N. Tulley, 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 the Environment and Energy, Re: Application for a Transfer Site to allow recycling site at landfill.
6. Letter dated March 3, 1993, from Eleanor N. Tully, Monteagle Township, to Brian Nickel, Ministry of the Environment and Energy, Re: Reply to Brian Nickel's faxed letter of March 3, 1993.
7. Ministry of Natural Resources Land Us Permit No. LUP 5201075 dated March 26, 1993.
8. Letter dated July 20, 1993, from Eleanor N. Tully, Monteagle Township, to D.E. Graham, Ministry of the Environment and Energy, Re: Submission of application requirements as requested by D.E. Graham's letter of May 7, 1993.
9. Application 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 the 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 the 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. Environmental Compliance Approval Application dated November 29, 2017 and signed by Pat Pilgrim, CAO, the Corporation of the Municipality of Hastings Highlands, including the attached supporting documentation.

14. Report titled "Development and Operations Plan, Musclow-Greenview Waste Disposal Site" dated November 2017 and prepared by BluMetric Environmental Inc.
15. Letter report dated April 18, 2018 from Iris O'Connor, BluMetric Environmental Inc. to Ranjani Munasinghe, Ministry of the Environment and Climate Change responding to comments from Technical Support Section, Ministry of the Environment and Climate Change for the Development and Operations Plan dated November 2017.

SCHEDULE "B"

Surface Water Monitoring Plan

Monitoring Locations	Parameters
SW1, SW2, SW3, new background	Biological Oxygen Demand (BOD_5), Phenols, Total Phosphorus, Total Kejdahl Nitrogen (TKN), Ammonia, Chloride, Nitrate, Nitrite, Sodium, Calcium, Magnesium, Sulphate, Alkalinity, Potassium, Aluminum, Barium, Boron, Cadmium, Copper, Cobalt, Iron, Lead, Manganese, Zinc, Chemical Oxygen Demand (COD), Conductivity, pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Hardness

SCHEDULE "C"

Groundwater Monitoring Plan

Monitoring Locations	Parameters
MG-DP1, MG-DP2, MG-DP3, MG-DP4	Dissolved Organic Carbon (DOC), Biological Oxygen Demand (BOD_5), Ammonia, Chloride, Nitrate, Sodium, Calcium, Magnesium, Sulphate, Alkalinity, Aluminum (dissolved), Barium, Boron, Cadmium, Chromium, Cobalt, Iron, Lead, Manganese, Silver, Zinc, Chemical Oxygen Demand (COD), Conductivity, pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS)

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

GENERAL

- The reason for Conditions 1(1), (2), (4), (5), (6), (7), (8), (9), (10), (17), (18) and (19) 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) and (15) 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(16) 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 (20) has been included in order to clarify what information may be subject to the Freedom of Information and Protection of Privacy Act, RSO 1990, CF-31 .

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 (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 the *Ministry* guidelines.
- The reasons for Condition 2(7), 2(8) and 2(9) 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(10) and 2(11) 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(7) 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(8) is to provide the *Owner* the process for getting the approval for alternative daily and intermediate cover material.
- The reasons for Condition 7(9) 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.*

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.

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 the *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). A362303 issued on April 27, 2018

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 24th day of October, 2019

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, P. Eng., BluMetric Environmental Inc.

Appendix A

A-2 Land Transfer Information

Ontario ServiceOntario

PARCEL REGISTER (ABBREVIATED) FOR PROPERTY IDENTIFIER

LAND REGISTRY OFFICE #21 | 40034-0210 (LT)

PREPARED FOR Cassidy1
ON 2017/08/28 AT 14:59:56

* CERTIFIED IN ACCORDANCE WITH THE LAND TITLES ACT * SUBJECT TO RESERVATIONS IN CROWN GRANT *

PROPERTY DESCRIPTION: PT LT 11 CON 11 MONTEAGLE PT 1 21R663; HASTINGS HIGHLANDS ; COUNTY OF HASTINGS

PROPERTY REMARKS:

ESTATE/QUALIFIER:
FEE SIMPLE
LT CONVERSION QUALIFIED

RECENTLY:
FIRST CONVERSION FROM BOOK

PIN CREATION DATE:
2008/03/17

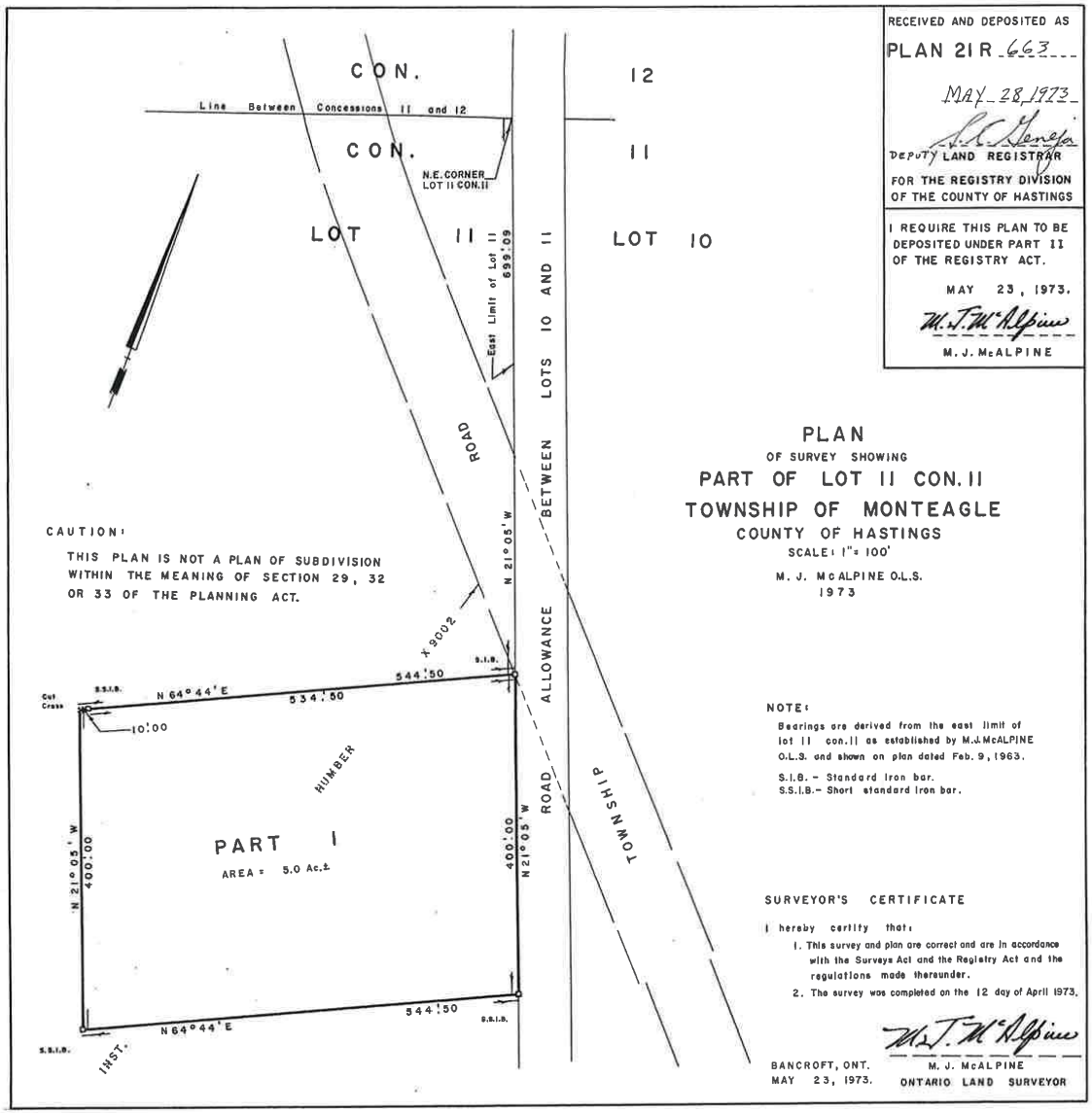
OWNERS' NAMES
THE CORPORATION OF THE TOWNSHIP OF MONTEAGLE

CAPACITY SHARE
ROWN

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
** PRINTOUT INCLUDES ALL DOCUMENT TYPES AND DELETED INSTRUMENTS SINCE 2008/03/14 **						
**SUBJECT, ON FIRST REGISTRATION UNDER THE LAND TITLES ACT, TO:						
** SUBSECTION 44(1) OF THE LAND TITLES ACT, EXCEPT PARAGRAPH 11, PARAGRAPH 14, PROVINCIAL SUCCESSION DUTIES *						
** AND ESCHEATS OR FORFEITURE TO THE CROWN.						
** THE RIGHTS OF ANY PERSON WHO WOULD, BUT FOR THE LAND TITLES ACT, BE ENTITLED TO THE LAND OR ANY PART OF						
** IT THROUGH LENGTH OF ADVERSE POSSESSION, PRESCRIPTION, MISDESCRIPTION OR BOUNDARIES SETTLED BY						
** CONVENTION.						
** ANY LEASE TO WHICH THE SUBSECTION 70(2) OF THE REGISTRY ACT APPLIES.						
**DATE OF CONVERSION TO LAND TITLES: 2008/03/17 **						
21R663	1973/05/28	PLAN REFERENCE				C
QR284199	1980/07/02	TRANSFER	$2		THE CORPORATION OF THE TOWNSHIP OF MONTEAGLE	C
QR284200	1980/07/02	NOTICE			CORPORATION OF THE TOWNSHIP OF MONTEAGLE	C

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

21R-663



RECEIVED AND DEPOSITED AS
PLAN 21R-663
MAY 28 1973
DEPUTY LAND REGISTRAR
FOR THE REGISTRY DIVISION
OF THE COUNTY OF HASTINGS

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER PART II OF THE REGISTRY ACT.

MAY 23, 1973.

M. J. McALPINE

PLAN
OF SURVEY SHOWING
PART OF LOT 11 CON. II
TOWNSHIP OF MONTEAGLE
COUNTY OF HASTINGS
SCALE: 1" = 100'

M. J. McALPINE O.L.S.
1973

CAUTION:

THIS PLAN IS NOT A PLAN OF SUBDIVISION WITHIN THE MEANING OF SECTION 29, 32 OR 33 OF THE PLANNING ACT.

NOTE:

Bearings are derived from the east limit of lot 11 con. II as established by M.J. McALPINE O.L.S. and shown on plan dated Feb. 9, 1963.

S.I.B. - Standard iron bar.
S.S.I.B. - Short standard iron bar.

SURVEYOR'S CERTIFICATE

I hereby certify that:

1. This survey and plan are correct and are in accordance with the Surveys Act and the Registry Act and the regulations made thereunder.
2. The survey was completed on the 12 day of April 1973.

BANCROFT, ONT.
MAY 23, 1973.

M. J. McALPINE
ONTARIO LAND SURVEYOR

Deed — *Without* Spousal Consent
(Amended July, 1979)

DYF & BURHAM LIMITED FORM NO. 13

284199

This Indenture

made in duplicate the Seventh day of May, one thousand nine hundred and eighty.

In Pursuance of the Short Forms of Conveyances Act:

Between

ARNOLD CLIFFORD KELUSKY, Farmer, and MAMIE KELUSKY, his wife, both of the Township of Monteagle, in the County of Hastings,

Hereinafter called the GRANTORS,

of the FIRST PART;

- and -

THE CORPORATION OF THE TOWNSHIP OF MONTEAGLE,

Hereinafter called the GRANTEE,

of the SECOND PART;

Witnesseth that in consideration of other good and valuable consideration and the sum of TWO----------($2.00)----------DOLLARS now paid by the said Grantee to the said Grantor, the receipt whereof is hereby by him acknowledged, he the said Grantor DOTH GRANT unto the said Grantee in fee simple

THOSE lands and premises located in the following municipality, namely, in the Township of Monteagle, in the County of Hastings, and being composed of Part of Lot 11 in Concession 11 of the said Township of Monteagle, and which said parcel or tract of land is more particularly described as PART 1 according to Plan 21R-663 now deposited in the Registry Office for the Registry Division of Hastings.

COMPARED

TO HAVE AND TO HOLD unto the said Grantee, his heirs, executors, administrators, successors and assigns to and for their sole and only use forever;
SUBJECT NEVERTHELESS to the reservations, limitations, provisoes and conditions expressed in the original grant thereof from the Crown.

The said Grantor COVENANTS with the said Grantee that he has the right to convey the said lands to the said Grantee notwithstanding any act of the said Grantor.

AND that the said Grantee shall have quiet possession of the said lands free from all encumbrances.

AND the said Grantor COVENANTS with the said Grantee that he will execute such further assurances of the said lands as may be requisite.

AND the said Grantor COVENANTS with the said Grantee that he has done no act to encumber the said lands.

AND the said Grantor RELEASES to the said Grantee ALL his claims upon the said lands.

PROVIDED that in construing these presents the words "Grantor" and "Grantee" and the pronouns "he", "his" or "him" relating thereto and used therewith shall be read and construed as "Grantor" or "Grantors", "Grantee" or "Grantees", and "he", "she", "it" or "they", "his", "her", "its" or "their", or "him", "her", "it" or "them", respectively, as the number and gender of the party or parties referred to in each case require, and the number of the verb agreeing therewith shall be construed as agreeing with the said word or pronoun so substituted.

IN WITNESS WHEREOF the said parties hereto have hereunto set their hands and seals.

SIGNED, SEALED AND DELIVERED
In the Presence of

Emmanuel Blazek

Arnold Clifford Kelusky (SEAL)
ARNOLD CLIFFORD KELUSKY

Mamie Kelusky (SEAL)
MAMIE KELUSKY

...Instructions
...se Side

Form 1

BYE & BURNHAM CO. LIMITED
FORM NO. 500

The Land Transfer Tax Act, 1974

AFFIDAVIT OF RESIDENCE AND OF VALUE OF THE CONSIDERATION

IN THE MATTER OF THE CONVEYANCE OF *(insert brief description of land)* PT. LOT 11, CONCESSION 11, PART 1, PLAN 21R-663, TOWNSHIP OF MONTEAGLE, COUNTY OF HASTINGS

BY *(print names of all transferors in full)* ARNOLD CLIFFORD KELUSKY & MAMIE KELUSKY

TO *(see instruction 1 and print names of all transferees in full)* THE CORPORATION OF THE TOWNSHIP OF MONTEAGLE

I, *(see instruction 2 and print name(s) in full)* O. GREGORY ANDERSON, OF THE VILLAGE OF BANCROFT, IN THE COUNTY OF HASTINGS,

MAKE OATH AND SAY THAT:

1. I am *(place a clear mark within the square opposite that one of the following paragraphs that describes the capacity of the deponent(s))* *(see instruction 2)*
   - ☐ (a) A person in trust for whom the land conveyed in the above-described conveyance is being conveyed;
   - ☐ (b) A trustee named in the above-described conveyance to whom the land is being conveyed;
   - ☐ (c) A transferee named in the above-described conveyance;
   - ☒ (d) The ~~solicitor~~ solicitor acting in this transaction for *(insert name(s) of principal(s))* The Corporation of the Township of Monteagle described in paragraph ~~(a) (b) (c)~~ (c) above; *(strike out references to inapplicable paragraphs)*
   - ☐ (e) The President, Vice-President, Manager, Secretary, Director, or Treasurer authorized to act for *(insert name(s) of corporation(s))* ..... described in paragraph(s) (a), (b), (c) above. *(strike out references to inapplicable paragraphs)*
   - ☐ (f) A transferee described in paragraph ( ) *(insert only one of paragraph (a), (b) or (c) above, as applicable)* and am making this affidavit on my own behalf and on behalf of *(insert name of spouse)* ..... who is my spouse described in paragraph ( ). *(insert only one of paragraph (a), (b) or (c) above, as applicable)*

   and as such, I have personal knowledge of the facts herein deposed to.
2. I have read and considered the definitions of "non-resident corporation" and "non-resident person" set out respectively in clauses f and g of subsection 1 of section 1 of the Act. *(see instruction 3)*
3. The following persons to whom or in trust for whom the land conveyed in the above-described conveyance is being conveyed are non-resident persons within the meaning of the Act. *(see instruction 4)* NONE
4. THE TOTAL CONSIDERATION FOR THIS TRANSACTION IS ALLOCATED AS FOLLOWS:

(a) Monies paid or to be paid in cash	$ 350.00	
(b) Mortgages (i) Assumed *(show principal and interest to be credited against purchase price)*	$ nil	
(ii) Given back to vendor	$ nil	
(c) Property transferred in exchange *(detail below)*	$ nil	
(d) Securities transferred to the value of *(detail below)*	$ nil	
(e) Liens, legacies, annuities and maintenance charges to which transfer is subject	$ nil	
(f) Other valuable consideration subject to land transfer tax *(detail below)*	$ nil	
(g) VALUE OF LAND, BUILDING, FIXTURES AND GOODWILL SUBJECT TO LAND TRANSFER TAX *(TOTAL OF (a) to (f))*	$ 350.00	$ 350.00
(h) VALUE OF ALL CHATTELS – Items of tangible personal property *(Retail Sales Tax is payable on the value of all chattels unless exempt under the provisions of The Retail Sales Tax Act, R S O 1970, c 415, as amended)*		$ nil
(i) Other consideration for transaction not included in (g) or (h) above		$ nil
(j) TOTAL CONSIDERATION		$ 350.00

ALL BLANKS MUST BE FILLED IN. INSERT "NIL" WHERE APPLICABLE.

5. If consideration is nominal, describe relationship between transferor and transferee and state purpose of conveyance. *(see instruction 5)* n/a
6. Other remarks and explanations, if necessary n/a

SWORN before me at the Village of Bancroft, in the County of Hastings, this 20th day of May, 1980.

A Commissioner for taking Affidavits, etc.

Annamarie Bintzel, a Commissioner, etc.

Hastings County, for O. Gregory Anderson Q.C.

Expires December 31, 1982

O. GREGORY ANDERSON
(signature(s))

PROPERTY INFORMATION RECORD

A. Describe nature of instrument: Deed

B. (i) Address of property being conveyed *(if available)* R. R. #1, MAPLE LEAF, Ontario. KOL 2RO

(ii) Assessment Roll No. *(if available)* N/A

C. Mailing address(es) for future Notices of Assessment under The Assessment Act for property being conveyed *(see instruction 6)* R. R. #1, Maple Leaf, Ontario. KOL 2RO

D. (i) Registration number for last conveyance of property being conveyed *(if available)* 115161

(ii) Legal description of property conveyed: Same as in D.(i) above. Yes ☐ No ☒ Not Known ☐

E. Name(s) and address(es) of each transferee's solicitor O. Gregory Anderson, Q.C., Barrister & Solicitor, P.O. Box 700, BANCROFT, Ontario. KOL 1CO

For Land Registry Office use only
REGISTRATION NO.
Land Registry Office No.
Registration Date

BY A. DURHAM CO. LIMITED

AFFIDAVIT OF SUBSCRIBING WITNESS

I, Annemarie Blazak

of the Village of Bancroft,

in the County of Hastings, Secretary,

make oath and say:

I am a subscribing witness to the attached instrument and I was present and saw it executed

*See footnote at Bancroft, Ontario by ARNOLD CLIFFORD KELUSKY & MAMIE KELUSKY

*See footnote I verily believe that each person whose signature I witnessed is the party of the same name referred to in the instrument.

SWORN before me at the Village of Bancroft, in the County of Hastings, this 20th day of May June 19 80.

Annemarie Blazak

A COMMISSIONER FOR TAKING AFFIDAVITS, ETC

*Where a party is unable to read the instrument or where a party signs by making his mark or in foreign characters add "after the instrument had been read to him and he appeared fully to understand it". Where executed under a power of attorney insert "(name of attorney) as attorney for (name of party)"; and for next clause substitute "I verily believe that the person whose signature I witnessed was authorized to execute the instrument as attorney for (name)".

AFFIDAVIT AS TO AGE AND SPOUSAL STATUS

~~X~~/WE ARNOLD CLIFFORD KELUSKY & MAMIE KELUSKY,

both of the Township of Monteagle,

in the County of Hastings,

*If attorney see footnote make oath and say: When we executed the attached instrument,

~~X~~/WE were at least eighteen years old.

Within the meaning of section 1(f) of The Family Law Reform Act, 1978:—

Strike out inapplicable clauses. ~~a) We were not spouses of one another.~~

b) We were spouses of one another.

~~X~~ ~~X~~

**Not a Matrimonial Home, etc. see footnote. We are not non-residents of Canada within the meaning of Sections 115 and 116 of The Income Tax Act.

Resident of Canada, etc.

(SEVERALLY) SWORN before me at the Village of Bancroft, in the County of Hastings, this 20th day of May June 19 80.

Annemarie Blazak

A COMMISSIONER FOR TAKING AFFIDAVITS, ETC

Arnold Clifford Kelusky

ARNOLD CLIFFORD KELUSKY

Mamie Kelusky

MAMIE KELUSKY

Annemarie Blazak, a Commissioner, etc., Hastings County, for O. Gregory Ashman, Q.C. Expires December 20, 1982

*Where affidavit is made by attorney substitute: "When I executed the attached instrument as attorney for (name), he/she was (spousal status and, if applicable, name of spouse) within the meaning of Section 1(f) of The Family Law Reform Act, 1978, and when he/she executed the power of attorney, he/she had attained the age of majority".

**Where spouse does not join in or consent, see Section 42(3) of The Family Law Reform Act, 1978 for complete separate affidavit).

AFFIDAVIT OF SUBSCRIBING WITNESS

I,

of the

in the

make oath and say:

I am a subscribing witness to the attached instrument and I was present and saw it executed

at by

*See footnote

*See footnote

I verily believe that each person whose signature I witnessed is the party of the same name referred to in the instrument.

SWORN before me at the

this day of 19

A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.

* *Where a party is unable to read the instrument or where a party signs by making his mark or in foreign characters add "after the instrument had been read to him and he appeared fully to understand it". Where executed under a power of attorney insert "(name of attorney) as attorney for (name of party)"; and for next clause substitute "I verily believe that the person whose signature I witnessed was authorized to execute the instrument as attorney for (name)".*

284199

Dated May 7, 19 80

ARNOLD CLIFFORD KELUSKY
and
MAMIE KELUSKY

TO

THE CORPORATION OF THE TOWNSHIP
OF MONTEAGLE

Address: R. R. #1,
MAPLE LEAF, Ontario.
K0L 2R0

Deed of Land

SITUATE
in the Township of Monteagle,
in the County of Hastings.

DYE & DURHAM CO. LIMITED

ASSESSMENT ROLL NO.

ADDRESS OF PROPERTY:

O. GREGORY ANDERSON, Q.C.,
Barrister & Solicitor,
P.O. Box 700,
BANCROFT, Ontario.
K0L 1C0

NOT RESPONSIBLE FOR TITLE OR DESCRIPTION HEREIN

PROPERTY OF THE REGISTRY OFFICE

ENTERED IN BOOK

FOR Monteagle

ENTERED BY

CHECKED BY

I CERTIFY THAT THIS INSTRUMENT IS REGISTERED IN THE REGISTRY DIVISION OF HASTINGS (21) AT BELLEVILLE, ONTARIO

1980 JUL -2 PM 1: 34

284199

A. E. Thomas
CLERK REGISTRAR

REGISTRATION FEE	15.00
LAND TRANSFER TAX	1.40
RETAIL SALES TAX	

284200

THE REGISTRY ACT

DECLARATION UNDER SECTION 23 OF THE ACT

I, OSWALD GREGORY ANDERSON, of the Village of Bancroft, in the County of Hastings, Solicitor, do solemnly declare that I am the Solicitor for The Corporation of the Township of Monteagle which is a party to the Provisional Certificate of Approval for a Waste Disposal Site hereto attached. The said instrument affects land within the Registry Division of the County of Hastings and more particularly THOSE lands and premises located in the following municipality, namely, in the Township of Monteagle, in the County of Hastings, and being composed of Part of Lot 11 in Concession 11 of the said Township of Monteagle, and which said parcel or tract of land is more particularly described as Part 1 according to Plan 21R-663 now deposited in the Registry Office for the Registry Division of Hastings.

I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath.

DECLARED before me)
at the Village of Bancroft,)
in the County of Hastings,)
this 23rd day of June, 1980)

OSWALD GREGORY ANDERSON

A Commissioner, etc.

Annemarie Blazek, a Commissioner, etc.
Hastings County, for O. Gregory Anderson Q.C.
Expires December 30, 19 82

Ministry of the Environment

Ontario

NOTICE

TO: Corporation of the Township of Monteagle
R.R. # 1
Maple Leaf, Ontario
KOL 2RO

You are hereby notified that Provisional Certificate of Approval No. A 362303 has been issued to you subject to the conditions outlined therein.

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

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

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

This Notice should be served upon:

The Secretary,
Environmental Appeal Board,
1 St. Clair Ave. West,
5th Floor,
Toronto, Ontario.
M4V 1K7

AND

The Director,
Section 39
Ministry of the Environment,

DATED this 31st day of March , 1980 .

Director,
Section 39
Ministry of the Environment.

MOE 1044 6/78

DATED THE 31st DAY OF

MARCH, 1980

BETWEEN

THE DIRECTOR

-and-

CORPORATION OF THE TOWNSHIP OF MONTEAGLE

PROVISIONAL CERTIFICATE

OF APPROVAL

UNDER

THE ENVIRONMENTAL

PROTECTION ACT, 1971

N. PART LOT 11, CONCESSION 11
TOWNSHIP OF MONTEAGLE
COUNTY OF HASTINGS

CORPORATION OF THE TOWNSHIP OF MONTEAGLE
MAPLE LEAF, ONTARIO
K0L 2R0

Ministry of the Environment
Ontario

Provisional Certificate No. A 362303

PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE

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

Corporation of the Township of Monteagle
R.R. # 1
Maple Leaf, Ontario
K0L 2R0

for the use and operation of a 1.0 hectare landfilling site within a total site area of 2.0 hectares.

all in accordance with the following plans and specifications:

Located: N. Part Lot 11, Concession 11
Township of Monteagle
County of Hastings

which includes the use of the site only for the disposal of the following categories of waste (NOTE: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval) domestic and commercial waste.

and subject to the following conditions:

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

Dated this 31st day of March, 19 80.

Director, Section 39,
The Environmental Protection Act, 1971

284200

PROPERTY OF THE REGISTRY OFFICE
ENTERED IN BOOK 4
FOR Deseronto
ENTERED BY
CHECKED BY

DATED MAY A.D. 1980

IN THE MATTER OF Part of
Lot 11, Concession 11
in the Township of Faraday
being Part 1, Plan 21R-663
County of Hastings

NOTICE RE: WASTE DISPOSAL
SITE

LAND REGISTRY OFFICE
OF BELLEVILLE,
ONTARIO
1980 JUL -2 PM 1:35
L.C. Blanger
LAND REGISTRAR

I CERTIFY THAT THIS
INSTRUMENT IS
REGISTERED IN THE
284200
REGISTRY DIVISION OF
HASTINGS (21)

5

O.GREGORY ANDERSON,Q.C.
Barrister & Solicitor,
P.O. Box 700
BANCROFT, Ontario
K0L 1C0

1500

Appendix B

Monitoring and Screening Checklist (MECP/MOE)

Appendix D-Monitoring and Screening Checklist
General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.
Instructions: A complete checklist consists of:
(a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
(b) completed contact information for the Competent Environmental Practitioner (CEP)
(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:
For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:
(a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..
Definition of Surface water CEP:
A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site Name	Musclow-Greenview Waste Disposal Site
Location (e.g. street address, lot, concession)	3375 Musclow Greenview Road
GPS Location (taken within the property boundary at front gate/ front entry)	279,927 m E, 5,010,658 m N
Municipality	Former Geographic Township of Monteagle
Client and/or Site Owner	Corporation of the Municipality of Hastings Highlands
Monitoring Period (Year)	2025
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval Number:	A362303
Director's Order No.:	
Provincial Officer's Order No.:	
Other:	

Report Submission Frequency	◉ **Annual** ○ **Other**	March 31st of year following reporting period	
The site is: **(Operation Status)**	◉ **Open** ○ **Inactive** ○ **Closed**		
Does your Site have a Total Approved Capacity?	◉ **Yes** ○ **No**		
If yes, please specify Total Approved Capacity	27,500	*Units*	Cubic Metres
Does your Site have a Maximum Approved Fill Rate?	○ **Yes** ◉ **No**		
If yes, please specify Maximum Approved Fill Rate	0	*Units*	
Total Waste Received within Monitoring Period (Year)	195.9	*Units*	Tonnes
Total Waste Received within Monitoring Period (Year) *Methodology*	Estimation		
Estimated Remaining Capacity	13,360	*Units*	Cubic Metres
Estimated Remaining Capacity *Methodology*	Estimation based on topographic survey completed on Nov 9, 2022 and 2023/2024 waste received		
Estimated Remaining Capacity *Date Last Determined*	31/Dec/2025		
Non-Hazardous Approved Waste Types	☒ Domestic ☒ Industrial, Commercial & Institutional (IC&I) ☒ Source Separated Organics (Green Bin) ☒ Tires	☒ Contaminated Soil ☒ Wood Waste ☒ Blue Box Material ☐ Processed Organics ☒ Leaf and Yard Waste	☐ Food Processing/Preparation Operations Waste ☐ Hauled Sewage Other:
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**	3/21/2018
Is your Site required to submit Financial Assurance?		○ **Yes** ◉ **No**	
Describe how your Landfill is designed.		◉ Natural Attenuation only ○ Fully engineered Facility ○ Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		○ **Yes** ◉ **No**	

If closed, specify C of A, control or authorizing document closure date:	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**	Groundwater discharges to surface water before the property line, so the intent of Guideline B-7 is satisfied. As such, a Trigger Mechanisms and Contingency Plan for groundwater is not necessary at this time but could be considered in the future.
2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document (s):	○ **Yes** ◉ **No** ○ **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
MG-18-2	Well broken at 2.2 meters below ground surface. Unable to sample.	Spring and Fall 2025

3) a) Is landfill gas being monitored or controlled at the site?	◉ **Yes** ○ **No**	
If yes to 3(a), please answer the next two questions below.		
b) Have any measurements been taken since the last reporting period that indicate landfill gas is present in the subsurface at levels exceeding criteria established for the site?	◉ **Yes** ○ **No**	
c) Has the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	○ **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 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**	

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**	No CAZ has been established for the Site. Additional work is concurrently being reported on and action items have been identified to minimize environmental impacts. Groundwater is believed to be discharging to surface water and Contingency Plans are being updated for surface water triggers.	
6) The site meets compliance and assessment criteria.	○ **Yes** ◉ **No**	See above.	
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**	New drive-point piezometer DP5 had exceedances further to the west of the WDS, including notable zinc exceedances. Boron concentrations to the west of the Site at SW3 are on an increasing trend.	
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 CEP Declaration:

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

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

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

Recommendations:

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

○ **No changes to the monitoring program are recommended**	Groundwater discharges to surface water before the property line, so the intent of Guideline B-7 is satisfied. As such, a Trigger Mechanisms and Contingency Plan for groundwater is not necessary at this time but could be considered in the future. Updates to surface water trigger level assessment drafted with monitoring report for 2025.
◉ **The following change(s) to the monitoring program is/are recommended:**	Monitoring Well MG-18-2 is broken, and should be replaced as it is a leachate characterization well. The current location is unsuitable and it is recommended to move the location to the south based on site observations.
○ **No Changes to site design and operation are recommended**	
◉ **The following change(s) to the site design and operation is/ are recommended:**	A new surface water diversion ditch/berm was installed in the fall of 2019. Operations should ensure this is kept clear, is flowing properly around the Site and is protected against erosion. Operations at the Site should be assessed in 2026 and an action plan to minimize water infiltration made at the Site.

Name:	Jaclyn Kalesnikoff, B.Sc., P.Geo.		
Seal:			
Signature:		**Date:**	25-Mar-2026
CEP Contact Information:			
Company:	BluMetric Environmental Inc.		
Address:	1682 Woodward Drive Ottawa, ON, K2C 3R8		
Telephone No.:	(877) 487-8436 x339	Fax No. :	(877) 487-8436
E-mail Address:	jkalesnikoff@blumetric.ca		
Co-signers for additional expertise provided:			
Signature:		**Date:**	Select Date
Signature:		**Date:**	Select Date

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):

Name (s)	Un-named Lake, Goodkey Creek
Distance(s)	0.25 km, 0.6 km

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	After several years of work, SW4A has now been determined to be the best location for monitoring background surface water.
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):	○ Yes ◉ No ○ **Not applicable (No C of A, authorizing / control document applies)**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
MG-SW1, MG-SW2, MG-SW3, MG-SW 6	Dry	October 2025
MG-SW4A and MG-SW7	Limited water present, no observable flow, could not sample	October 2025

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry C of A or authorizing/control document.	◉ **Yes** ○ **No** ○ **Not Applicable**	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:	◉ **Yes** ○ **No** ○ **Not Applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**

4) All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	◉ **Yes** ○ **No**	Not applicable

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

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

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

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO
SEE SW ATTACHMENT		.
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	○ **Yes** ◉ **No**	

7) All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.	○ **Yes** ◉ **No**	Cross gradient and downgradient concentrations remain above criteria for many parameters (iron, boron, phenols, total phosphorous) when compared to background.
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	Iron, boron, cobalt, zinc exceed the PWQO.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	○ **Yes** ◉ **No** ○ **Not Applicable**	Toxicity sampling at SW3 was initiated as regular sampling and if passes no further sampling is required. Both spring and fall toxicity sampling passed in 2025.

Surface Water CEP Declaration:

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

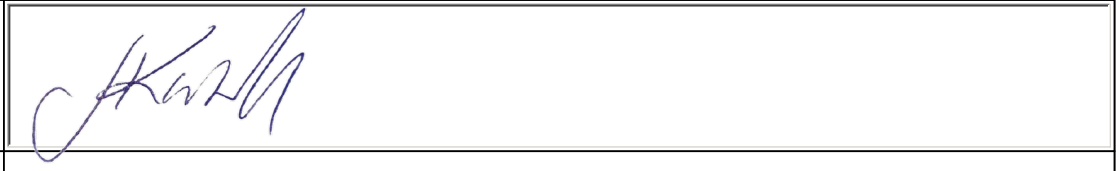
I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended)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

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

Recommendations:

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

◉ **No Changes to the monitoring program are recommended**	Sampling to be done at SW1, SW2, SW3, and SW4A, and SW6 in 2026. Implementation of updated surface water trigger level assessment plan.
○ **The following change(s) to the monitoring program is/are recommended:**	
○ **No changes to the site design and operation are recommended**	
◉ **The following change(s) to the site design and operation is/are recommended:**	Operations are to be evaluated and additional measures should be taken to reduce infiltration, run -off.

CEP Signature	
Relevant Discipline	Hydrogeologist
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 x339
Fax No. :	(877) 487-8436
E-mail Address:	jkalesnikoff@blumetric.ca

Save As		**Print Form**

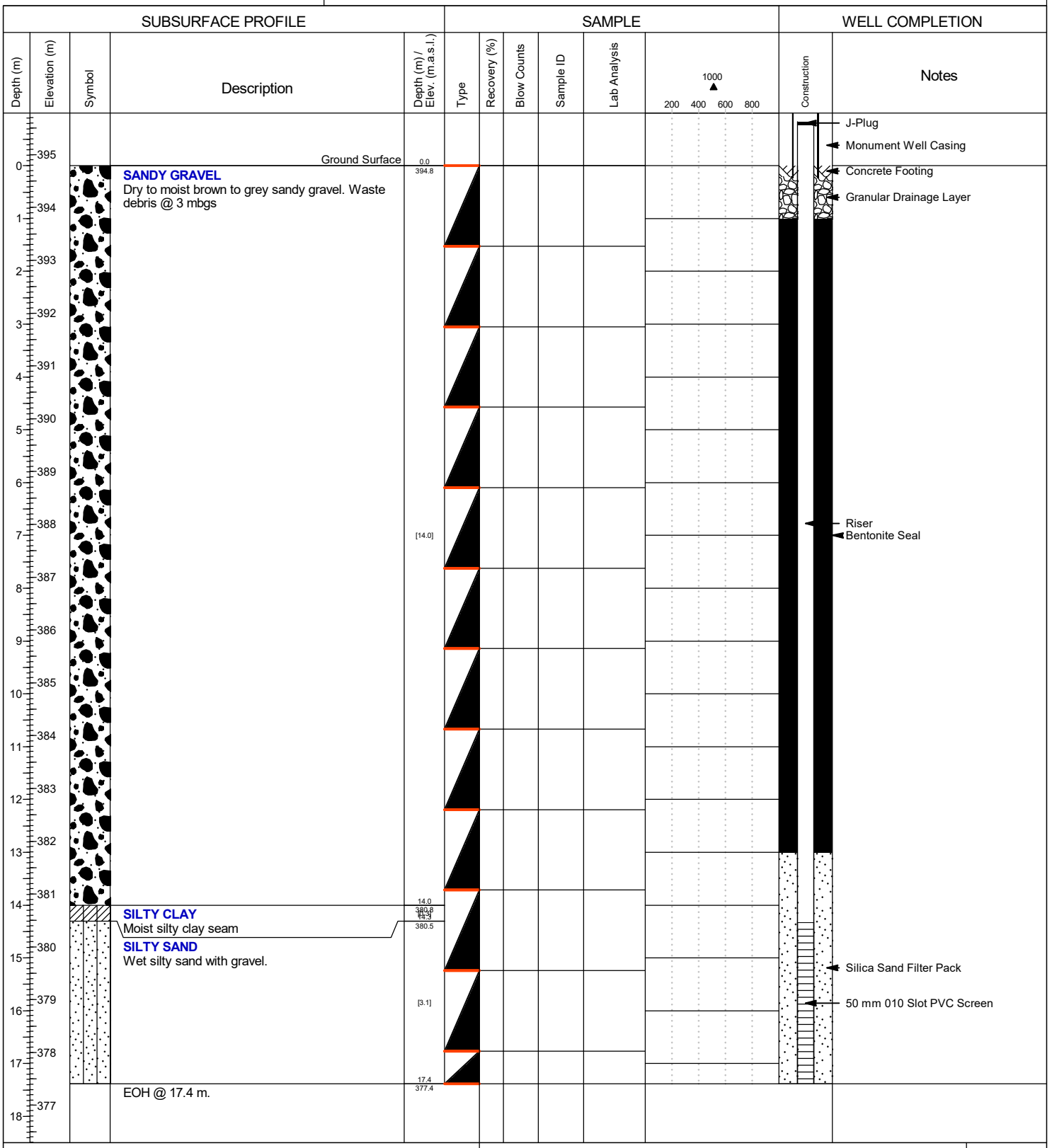
Appendix C

Monitoring Well Logs

Monitoring Well ID: MG18-1

Project No.: 180580-01
Client: MHH
Report: Musclow Greenview WDS
Site Address: Musclow Greenview
Ontario

Elevation Ground: *394.79 m*
TOP: *395.57 m*



Drill Date: December 19, 2018
Drilled By: Orbit Garant
Drilling Method: Hollow Stem Auger

Hole Diameter (OD): 0.20 m
Logged By: AB
Checked By: CM

AUGER SAMPLE
Perched Groundwater Strike / Unstabilized Groundwater Level
True Groundwater Strike / Stabilized Groundwater Level

Sheet
1 of 1

BH MW OB LOG 230226 - MG UPDATED.GPJ BLUMETRIC STANDARD.GDT 2/2/24

Monitoring Well ID: MG18-2

Project No.: 180580-01
Client: MHH
Report: Musclow Greenview WDS
Site Address: Musclow Greenview
Ontario

Elevation Ground: *390.61 m*
TOP: *391.33 m*

Depth (m)	Elevation (m)	Description	Depth (m) / Elev. (m.a.s.l.)
		Ground Surface	0.0
0	391		390.6
		SAND & GRAVEL Dry	[1.5]
1	390		1.5
			389.1
2	389	**WASTE MATERIAL** Dry, decomposed waste material and organic matter	[1.5]
	388		3.0
3			387.6
	387	**SAND & GRAVEL** Moist sand and gravel	[1.5]
4			4.5
	386		386.1
5		**WASTE MATERIAL** Decomposed waste and plastic, moist	
	385		
6			
	384		
7			
	383		[6.1]
8			
	382		
9			
	381		
10			10.6
	380		380.0
11		**SILTY SAND** Moist to wet silty sand	
	379		
12			
	378		
13			
	377		
14			
	376		
15			
	375		
16			[10.9]
	374		
17			
	373		
18			
	372		
19			
	371		
20			
	370		
21			21.5
	369	EOH @ 21.5 mbgs. MOE Well Tag # A255638	369.1

SAMPLE: Type | Recovery (%) | Blow Counts | Sample ID | Lab Analysis

1000 ▲
200 400 600 800

WELL COMPLETION: Construction | Notes

- J-Plug
- Monument Well Casing
- Concrete Footing
- Granular Drainage Layer
- Riser
- Bentonite Seal
- Silica Sand Filter Pack
- 50 mm 010 Slot PVC Screen

Drill Date: December 18, 2018
Drilled By: Orbit Garant
Drilling Method: Hollow Stem Auger

Hole Diameter (OD): 0.20 m
Logged By: AB
Checked By: CM

AUGER SAMPLE

Perched Groundwater Strike / Unstabilized Groundwater Level

True Groundwater Strike / Stabilized Groundwater Level

Sheet
1 of 1

BH MW OB LOG 230226 - MG UPDATED.GPJ BLUMETRIC STANDARD.GDT 2/2/24

Monitoring Well ID: MG18-3R

Project No.: 230226
Client: MHH
Report: Musclow Greenview WDS
Site Address: Musclow Greenview
Ontario

Elevation Ground: *389.94 m*
TOP: *390.78 m*

Depth (m)	Elevation (m)	Description	Depth (m) / Elev. (m.a.s.l.)
		Ground Surface	0.0 / 389.9
0–6	390–384	**SANDY SILT** Dry, brown to grey sandy silt with trace cobbles	[6.1]
6–12	384–378	**SANDY SILT** Moist, grey sandy silt with gravel and trace cobbles	6.1 / 383.8 – [6.1] – 12.2 / 377.8
12–16.2	378–374	**SANDY SILT** Wet to saturated, grey sandy silt with gravel and trace cobble	[4.0] – 16.1 / 373.8
16.2	374	EOH @ 16.2 m. Auger refusal @ EOH in assumed cobbles. MOE Tag A361505	

SAMPLE: Type, Recovery (%), Blow Counts, Sample ID, Lab Analysis; 1000 ▲ (200 400 600 800)

WELL COMPLETION: Construction

Notes:
- J-Plug
- Monument Well Casing
- Concrete Footing
- Native Backfill
- Riser
- Bentonite Seal
- Silica Sand Filter Pack
- 50 mm 010 Slot PVC Screen

Drill Date: September 18, 2023
Drilled By: Canadian Environmental
Drilling Method: Hollow Stem Auger
Hole Diameter (OD): 0.20 m
Logged By: BM
Checked By: CM

AUGER SAMPLE
Perched Groundwater Strike / Unstabilized Groundwater Level
True Groundwater Strike / Stabilized Groundwater Level

Sheet 1 of 1

BH MW OB LOG 230226 - MG UPDATED.GPJ BLUMETRIC STANDARD.GDT 2/2/24

Appendix D

Inspection Forms, Laboratory Reports, and Chain of Custody Records

Appendix D

D-1 Operation and Inspection Forms

SMALL LANDFILL
OPERATION AND INSPECTION FORM

BluMetric Environmental

Site Name: Musclow-Greenview WDS, MHHs	Date: May 5th, 2025	Weather:
Project #: 250253-07	BluMetric Staff: NW & BM	15°C. Sunny w/ some rain

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 _
❑	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 _ → MW-18-2 is broken but on the 2025 repair list
❑	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's 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.)

→ MHH workers on-site doing spring clean-up

→ Blown plastics observed in brush pile - should be removed

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

BluMetric™ Environmental

Site Name: Musclow-Greenview WDS, MHHs	**Date:** 2025/Oct/16	**Weather:** Sunny 2-8°C
Project #: 250253-07	**BluMetric Staff:** BM/NW	

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 _
❑ 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 - should be removed before winter
❑ Brush pile neat and appropriate size	Yes _	No _	
❑ Construction Debris neat and appropriate size	Yes _	No _	NA ✓

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 _	Attendent 5ppm
❑ 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.

Appendix D

D-2 Groundwater Laboratory Reports

Your Project #: 250253-07
Site Location: Musclow Greenview
Your C.O.C. #: 1062818-01-01

Attention: MHH Distribution

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/10/26
Report #: R8638873
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C5D1451
Received: 2025/10/17, 11:17

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	2	N/A	2025/10/24	CAM SOP-00448	SM 24 2320 B m
Alkalinity	6	N/A	2025/10/25	CAM SOP-00448	SM 24 2320 B m
Biochemical Oxygen Demand (BOD)	8	2025/10/20	2025/10/25	CAM SOP-00427	SM 24 5210B m
Chloride by Automated Colourimetry	5	N/A	2025/10/21	CAM SOP-00463	SM 24 4500-Cl E m
Chloride by Automated Colourimetry	3	N/A	2025/10/24	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	8	N/A	2025/10/24	CAM SOP-00416	SM 24 5220 D m
Conductivity	2	N/A	2025/10/24	CAM SOP-00414	SM 24 2510 m
Conductivity	6	N/A	2025/10/25	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	8	N/A	2025/10/22	CAM SOP-00446	SM 24 5310 B m
Dissolved Metals by ICPMS	7	N/A	2025/10/22	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2025/10/23	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	7	N/A	2025/10/21	CAM SOP-00441	USGS I-2522-90 m
Total Ammonia-N	1	N/A	2025/10/24	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	8	N/A	2025/10/21	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	2	2025/10/21	2025/10/24	CAM SOP-00413	SM 24th - 4500H+ B
pH (3)	6	2025/10/21	2025/10/25	CAM SOP-00413	SM 24th - 4500H+ B
Sulphate by Automated Turbidimetry	5	N/A	2025/10/21	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	1	N/A	2025/10/23	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	2	N/A	2025/10/24	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	8	2025/10/22	2025/10/23	CAM SOP-00428	SM 24 2540C m
Total Suspended Solids	7	2025/10/22	2025/10/22	CAM SOP-00428	SM 24 2540D m
Total Suspended Solids	1	2025/10/22	2025/10/23	CAM SOP-00428	SM 24 2540D 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

Your Project #: 250253-07
Site Location: Musclow Greenview
Your C.O.C. #: 1062818-01-01

Attention: MHH Distribution

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/10/26
Report #: R8638873
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C5D1451
Received: 2025/10/17, 11:17

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) 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 #: C5D1451
Report Date: 2025/10/26

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AWIY31			AWIY31			AWIY32		
Sampling Date		2025/10/16 11:00			2025/10/16 11:00			2025/10/16 11:55		
COC Number		1062818-01-01			1062818-01-01			1062818-01-01		
	UNITS	MG-DP1	RDL	QC Batch	MG-DP1 Lab-Dup	RDL	QC Batch	MG-DP2	RDL	QC Batch
Inorganics										
Total Ammonia-N	mg/L	0.29	0.050	A036348				5.8	0.050	A037487
Total BOD	mg/L	ND	2	A035753				ND	2	A035753
Total Chemical Oxygen Demand (COD)	mg/L	10	4.0	A037943	9.3	4.0	A037943	20	4.0	A037859
Conductivity	umho/cm	760	2.0	A036412	750	2.0	A036412	320	2.0	A036412
Total Dissolved Solids	mg/L	465	10	A037575				110	10	A037575
Dissolved Organic Carbon	mg/L	9.1	0.4	A036041				17	0.4	A036041
pH	pH	7.77		A036413	7.81		A036413	7.27		A036413
Total Suspended Solids	mg/L	ND	10	A037532	ND	10	A037532	ND	10	A037451
Dissolved Sulphate (SO4)	mg/L	98	1.0	A035966				4.6	1.0	A035966
Alkalinity (Total as CaCO3)	mg/L	240	1.0	A036406	240	1.0	A036406	160	1.0	A036406
Dissolved Chloride (Cl-)	mg/L	40	1.0	A035948				ND	1.0	A035948
Nitrate (N)	mg/L	ND	0.10	A036014	ND	0.10	A036014	ND	0.10	A036014

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.

Bureau Veritas Job #: C5D1451
Report Date: 2025/10/26

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AWIY33			AWIY33			AWIY34		
Sampling Date		2025/10/16 13:00			2025/10/16 13:00			2025/10/16 12:10		
COC Number		1062818-01-01			1062818-01-01			1062818-01-01		
	UNITS	MG-DP3	RDL	QC Batch	MG-DP3 Lab-Dup	RDL	QC Batch	MG-DP4	RDL	QC Batch
Inorganics										
Total Ammonia-N	mg/L	0.57	0.050	A036348				ND	0.050	A036348
Total BOD	mg/L	ND	2	A035753				40	2	A035753
Total Chemical Oxygen Demand (COD)	mg/L	24	4.0	A037859				55	4.0	A037943
Conductivity	umho/cm	1600	2.0	A036412				220	2.0	A036412
Total Dissolved Solids	mg/L	945	10	A037575				135	10	A037575
Dissolved Organic Carbon	mg/L	23	0.4	A036046				4.9	0.4	A036041
pH	pH	7.32		A036413				7.80		A036413
Total Suspended Solids	mg/L	ND	10	A037451				130	10	A037451
Dissolved Sulphate (SO4)	mg/L	32	1.0	A037496	31	1.0	A037496	14	1.0	A036856
Alkalinity (Total as CaCO3)	mg/L	710	1.0	A036406				88	1.0	A036406
Dissolved Chloride (Cl-)	mg/L	90	1.0	A037500	90	1.0	A037500	3.5	1.0	A036854
Nitrate (N)	mg/L	ND	0.10	A036014				ND	0.10	A036014

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.

Bureau Veritas Job #: C5D1451
Report Date: 2025/10/26

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AWIY35			AWIY35			AWIY36		
Sampling Date		2025/10/16 10:20			2025/10/16 10:20			2025/10/16 12:40		
COC Number		1062818-01-01			1062818-01-01			1062818-01-01		
	UNITS	MG-DP5	RDL	QC Batch	MG-DP5 Lab-Dup	RDL	QC Batch	MG-18-1	RDL	QC Batch
Inorganics										
Total Ammonia-N	mg/L	0.16	0.050	A036348				0.20	0.050	A036348
Total BOD	mg/L	5	2	A035753				ND	2	A035753
Total Chemical Oxygen Demand (COD)	mg/L	23	4.0	A037943				ND	4.0	A037943
Conductivity	umho/cm	890	2.0	A036412				560	2.0	A036412
Total Dissolved Solids	mg/L	620	10	A037563	615	10	A037563	205	10	A037575
Dissolved Organic Carbon	mg/L	10	0.4	A036046				4.1	0.4	A036041
pH	pH	7.15		A036413				7.37		A036413
Total Suspended Solids	mg/L	170	10	A037451				2900	50	A037451
Dissolved Sulphate (SO4)	mg/L	39	1.0	A035966				16	1.0	A036856
Alkalinity (Total as CaCO3)	mg/L	360	1.0	A036406				170	1.0	A036406
Dissolved Chloride (Cl-)	mg/L	49	1.0	A035948				56	1.0	A036854
Nitrate (N)	mg/L	0.11	0.10	A036014				ND	0.10	A036014

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.

Bureau Veritas Job #: C5D1451
Report Date: 2025/10/26

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AWIY37	AWIY38		
Sampling Date		2025/10/16 12:25	2025/10/16 12:40		
COC Number		1062818-01-01	1062818-01-01		
	UNITS	MG-18-3R	MG-QAQC-GW1	RDL	QC Batch
Inorganics					
Total Ammonia-N	mg/L	ND	0.14	0.050	A036348
Total BOD	mg/L	ND	ND	2	A035753
Total Chemical Oxygen Demand (COD)	mg/L	ND	ND	4.0	A037943
Conductivity	umho/cm	130	560	2.0	A036412
Total Dissolved Solids	mg/L	220	340	10	A037575
Dissolved Organic Carbon	mg/L	1.9	4.0	0.4	A036046
pH	pH	7.32	7.57		A036413
Total Suspended Solids	mg/L	5600	6000	50	A037451
Dissolved Sulphate (SO4)	mg/L	8.3	16	1.0	A035966
Alkalinity (Total as CaCO3)	mg/L	62	160	1.0	A036406
Dissolved Chloride (Cl-)	mg/L	ND	54	1.0	A035948
Nitrate (N)	mg/L	ND	ND	0.10	A036014

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 #: C5D1451
Report Date: 2025/10/26

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AWIY31	AWIY31	AWIY32	AWIY33	AWIY34		
Sampling Date		2025/10/16 11:00	2025/10/16 11:00	2025/10/16 11:55	2025/10/16 13:00	2025/10/16 12:10		
COC Number		1062818-01-01	1062818-01-01	1062818-01-01	1062818-01-01	1062818-01-01		
	UNITS	MG-DP1	MG-DP1 Lab-Dup	MG-DP2	MG-DP3	MG-DP4	RDL	QC Batch
Metals								
Dissolved Aluminum (Al)	ug/L	ND	ND	ND	ND	ND	4.9	A035647
Dissolved Barium (Ba)	ug/L	75	74	30	220	12	2.0	A035647
Dissolved Boron (B)	ug/L	60	60	30	750	14	10	A035647
Dissolved Cadmium (Cd)	ug/L	ND	ND	ND	ND	ND	0.090	A035647
Dissolved Calcium (Ca)	ug/L	130000	130000	43000	250000	31000	200	A035647
Dissolved Chromium (Cr)	ug/L	ND	ND	ND	ND	ND	5.0	A035647
Dissolved Cobalt (Co)	ug/L	ND	ND	ND	3.5	ND	0.50	A035647
Dissolved Iron (Fe)	ug/L	ND	ND	ND	470	ND	100	A035647
Dissolved Lead (Pb)	ug/L	ND	ND	ND	ND	ND	0.50	A035647
Dissolved Magnesium (Mg)	ug/L	10000	9800	3700	37000	4800	50	A035647
Dissolved Manganese (Mn)	ug/L	130	120	64	420	ND	2.0	A035647
Dissolved Silver (Ag)	ug/L	ND	ND	ND	ND	ND	0.090	A035647
Dissolved Sodium (Na)	ug/L	14000	14000	4000	66000	4600	100	A035647
Dissolved Zinc (Zn)	ug/L	ND	ND	ND	ND	ND	5.0	A035647

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.

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AWIY35		AWIY36	AWIY37	AWIY38		
Sampling Date		2025/10/16 10:20		2025/10/16 12:40	2025/10/16 12:25	2025/10/16 12:40		
COC Number		1062818-01-01		1062818-01-01	1062818-01-01	1062818-01-01		
	UNITS	MG-DP5	RDL	MG-18-1	MG-18-3R	MG-QAQC-GW1	RDL	QC Batch
Metals								
Dissolved Aluminum (Al)	ug/L	ND	4.9	ND	9.4	ND	4.9	A035647
Dissolved Barium (Ba)	ug/L	57	2.0	68	13	69	2.0	A035647
Dissolved Boron (B)	ug/L	100	10	150	ND	150	10	A035647
Dissolved Cadmium (Cd)	ug/L	ND	0.090	0.095	ND	0.11	0.090	A035647
Dissolved Calcium (Ca)	ug/L	160000	200	60000	21000	61000	200	A035647
Dissolved Chromium (Cr)	ug/L	ND	5.0	ND	ND	ND	5.0	A035647
Dissolved Cobalt (Co)	ug/L	46	0.50	21	ND	22	0.50	A035647
Dissolved Iron (Fe)	ug/L	55000	100	350	ND	350	100	A035647
Dissolved Lead (Pb)	ug/L	ND	0.50	ND	ND	ND	0.50	A035647
Dissolved Magnesium (Mg)	ug/L	15000	50	15000	1300	15000	50	A035647
Dissolved Manganese (Mn)	ug/L	2000	2.0	4100	4.7	4200	2.0	A035647
Dissolved Silver (Ag)	ug/L	ND	0.090	ND	ND	ND	0.090	A035647
Dissolved Sodium (Na)	ug/L	10000	100	24000	2800	24000	100	A035647
Dissolved Zinc (Zn)	ug/L	63000	25	ND	ND	ND	5.0	A035647

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 #: C5D1451
Report Date: 2025/10/26

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AWIY31
Sample ID: MG-DP1
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A036406	N/A	2025/10/24	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035753	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A035948	N/A	2025/10/21	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037943	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/24	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A036041	N/A	2025/10/22	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A035647	N/A	2025/10/22	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A036348	N/A	2025/10/21	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036014	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/24	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A035966	N/A	2025/10/21	Massarat Jan
Total Dissolved Solids	BAL	A037575	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA
Total Suspended Solids	BAL	A037532	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA

Bureau Veritas ID: AWIY31 Dup
Sample ID: MG-DP1
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A036406	N/A	2025/10/24	Surinder Rai
Chemical Oxygen Demand	SPEC	A037943	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/24	Surinder Rai
Dissolved Metals by ICPMS	ICP/MS	A035647	N/A	2025/10/22	Indira HarryPaul
Nitrate & Nitrite as Nitrogen in Water	LACH	A036014	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/24	Surinder Rai
Total Suspended Solids	BAL	A037532	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA

Bureau Veritas ID: AWIY32
Sample ID: MG-DP2
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A036406	N/A	2025/10/25	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035753	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A035948	N/A	2025/10/21	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037859	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A036041	N/A	2025/10/22	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A035647	N/A	2025/10/22	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A037487	N/A	2025/10/24	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036014	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/25	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A035966	N/A	2025/10/21	Massarat Jan
Total Dissolved Solids	BAL	A037575	2025/10/22	2025/10/23	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: AWIY32 **Collected:** 2025/10/16
Sample ID: MG-DP2 **Shipped:**
Matrix: Water **Received:** 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Suspended Solids	BAL	A037451	2025/10/22	2025/10/22	Hiu Fung Yan (James)

Bureau Veritas ID: AWIY33 **Collected:** 2025/10/16
Sample ID: MG-DP3 **Shipped:**
Matrix: Water **Received:** 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A036406	N/A	2025/10/25	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035753	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A037500	N/A	2025/10/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037859	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A036046	N/A	2025/10/22	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A035647	N/A	2025/10/22	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A036348	N/A	2025/10/21	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036014	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/25	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A037496	N/A	2025/10/23	Massarat Jan
Total Dissolved Solids	BAL	A037575	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA
Total Suspended Solids	BAL	A037451	2025/10/22	2025/10/22	Hiu Fung Yan (James)

Bureau Veritas ID: AWIY33 Dup **Collected:** 2025/10/16
Sample ID: MG-DP3 **Shipped:**
Matrix: Water **Received:** 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	SKAL	A037500	N/A	2025/10/24	Alina Dobreanu
Sulphate by Automated Turbidimetry	SKAL	A037496	N/A	2025/10/23	Massarat Jan

Bureau Veritas ID: AWIY34 **Collected:** 2025/10/16
Sample ID: MG-DP4 **Shipped:**
Matrix: Water **Received:** 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A036406	N/A	2025/10/25	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035753	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A036854	N/A	2025/10/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037943	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A036041	N/A	2025/10/22	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A035647	N/A	2025/10/22	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A036348	N/A	2025/10/21	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036014	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/25	Surinder Rai

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: AWIY34 **Collected:** 2025/10/16
Sample ID: MG-DP4 **Shipped:**
Matrix: Water **Received:** 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphate by Automated Turbidimetry	SKAL	A036856	N/A	2025/10/24	Massarat Jan
Total Dissolved Solids	BAL	A037575	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA
Total Suspended Solids	BAL	A037451	2025/10/22	2025/10/22	Hiu Fung Yan (James)

Bureau Veritas ID: AWIY35 **Collected:** 2025/10/16
Sample ID: MG-DP5 **Shipped:**
Matrix: Water **Received:** 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A036406	N/A	2025/10/24	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035753	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A035948	N/A	2025/10/21	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037943	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/24	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A036046	N/A	2025/10/22	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A035647	N/A	2025/10/23	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A036348	N/A	2025/10/21	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036014	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/24	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A035966	N/A	2025/10/21	Massarat Jan
Total Dissolved Solids	BAL	A037563	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA
Total Suspended Solids	BAL	A037451	2025/10/22	2025/10/22	Hiu Fung Yan (James)

Bureau Veritas ID: AWIY35 Dup **Collected:** 2025/10/16
Sample ID: MG-DP5 **Shipped:**
Matrix: Water **Received:** 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	A037563	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA

Bureau Veritas ID: AWIY36 **Collected:** 2025/10/16
Sample ID: MG-18-1 **Shipped:**
Matrix: Water **Received:** 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A036406	N/A	2025/10/25	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035753	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A036854	N/A	2025/10/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037943	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A036041	N/A	2025/10/22	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A035647	N/A	2025/10/22	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A036348	N/A	2025/10/21	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036014	N/A	2025/10/21	Chandra Nandlal

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 #: C5D1451
Report Date: 2025/10/26

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AWIY36
Sample ID: MG-18-1
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	A036413	2025/10/21	2025/10/25	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A036856	N/A	2025/10/24	Massarat Jan
Total Dissolved Solids	BAL	A037575	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA
Total Suspended Solids	BAL	A037451	2025/10/22	2025/10/22	Hiu Fung Yan (James)

Bureau Veritas ID: AWIY37
Sample ID: MG-18-3R
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A036406	N/A	2025/10/25	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035753	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A035948	N/A	2025/10/21	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037943	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A036046	N/A	2025/10/22	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A035647	N/A	2025/10/22	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A036348	N/A	2025/10/21	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036014	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/25	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A035966	N/A	2025/10/21	Massarat Jan
Total Dissolved Solids	BAL	A037575	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA
Total Suspended Solids	BAL	A037451	2025/10/22	2025/10/22	Hiu Fung Yan (James)

Bureau Veritas ID: AWIY38
Sample ID: MG-QAQC-GW1
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	A036406	N/A	2025/10/25	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035753	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A035948	N/A	2025/10/21	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037943	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	A036046	N/A	2025/10/22	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	A035647	N/A	2025/10/22	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	A036348	N/A	2025/10/21	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036014	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/25	Surinder Rai
Sulphate by Automated Turbidimetry	SKAL	A035966	N/A	2025/10/21	Massarat Jan
Total Dissolved Solids	BAL	A037575	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA
Total Suspended Solids	BAL	A037451	2025/10/22	2025/10/22	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	4.7°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 Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A035647	Dissolved Aluminum (Al)	2025/10/22	106	80 - 120	114	80 - 120	ND, RDL=4.9	ug/L	NC	20		
A035647	Dissolved Barium (Ba)	2025/10/22	99	80 - 120	98	80 - 120	ND, RDL=2.0	ug/L	1.3	20		
A035647	Dissolved Boron (B)	2025/10/22	91	80 - 120	91	80 - 120	ND, RDL=10	ug/L	0.14	20		
A035647	Dissolved Cadmium (Cd)	2025/10/22	101	80 - 120	99	80 - 120	ND, RDL=0.090	ug/L	NC	20		
A035647	Dissolved Calcium (Ca)	2025/10/22	NC	80 - 120	103	80 - 120	ND, RDL=200	ug/L	0.47	20		
A035647	Dissolved Chromium (Cr)	2025/10/22	96	80 - 120	95	80 - 120	ND, RDL=5.0	ug/L	NC	20		
A035647	Dissolved Cobalt (Co)	2025/10/22	100	80 - 120	100	80 - 120	ND, RDL=0.50	ug/L	NC	20		
A035647	Dissolved Iron (Fe)	2025/10/22	100	80 - 120	100	80 - 120	ND, RDL=100	ug/L	NC	20		
A035647	Dissolved Lead (Pb)	2025/10/22	96	80 - 120	94	80 - 120	ND, RDL=0.50	ug/L	NC	20		
A035647	Dissolved Magnesium (Mg)	2025/10/22	97	80 - 120	103	80 - 120	ND, RDL=50	ug/L	2.4	20		
A035647	Dissolved Manganese (Mn)	2025/10/22	99	80 - 120	98	80 - 120	ND, RDL=2.0	ug/L	2.2	20		
A035647	Dissolved Silver (Ag)	2025/10/22	81	80 - 120	91	80 - 120	ND, RDL=0.090	ug/L	NC	20		
A035647	Dissolved Sodium (Na)	2025/10/22	95	80 - 120	99	80 - 120	ND, RDL=100	ug/L	0.55	20		
A035647	Dissolved Zinc (Zn)	2025/10/22	99	80 - 120	97	80 - 120	ND, RDL=5.0	ug/L	NC	20		
A035753	Total BOD	2025/10/25					ND,RDL=2	mg/L	NC	30	96	80 - 120
A035948	Dissolved Chloride (Cl-)	2025/10/21	NC	80 - 120	93	80 - 120	ND, RDL=1.0	mg/L	0.30	20		
A035966	Dissolved Sulphate (SO4)	2025/10/21	102	75 - 125	96	80 - 120	ND, RDL=1.0	mg/L	2.6	20		
A036014	Nitrate (N)	2025/10/21	90	80 - 120	90	80 - 120	ND, RDL=0.10	mg/L	NC	20		
A036041	Dissolved Organic Carbon	2025/10/21	91	80 - 120	95	80 - 120	ND, RDL=0.4	mg/L	1.4	20		
A036046	Dissolved Organic Carbon	2025/10/22	92	80 - 120	95	80 - 120	ND, RDL=0.4	mg/L	0.95	20		
A036348	Total Ammonia-N	2025/10/21	103	75 - 125	95	80 - 120	ND, RDL=0.050	mg/L	1.0	20		
A036406	Alkalinity (Total as CaCO3)	2025/10/24			97	85 - 115	ND, RDL=1.0	mg/L	2.3	20		
A036412	Conductivity	2025/10/24			99	85 - 115	ND, RDL=2.0	umho/cm	0.53	10		
A036413	pH	2025/10/24			102	98 - 103			0.53	N/A		
A036854	Dissolved Chloride (Cl-)	2025/10/24	NC	80 - 120	94	80 - 120	ND, RDL=1.0	mg/L	1.7	20		
A036856	Dissolved Sulphate (SO4)	2025/10/24	91	75 - 125	99	80 - 120	ND, RDL=1.0	mg/L	2.9	20		
A037451	Total Suspended Solids	2025/10/22			97	80 - 120	ND, RDL=10	mg/L	1.4	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 Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A037487	Total Ammonia-N	2025/10/24	101	75 - 125	95	80 - 120	ND, RDL=0.050	mg/L	0	20		
A037496	Dissolved Sulphate (SO4)	2025/10/23	79	75 - 125	97	80 - 120	ND, RDL=1.0	mg/L	2.9	20		
A037500	Dissolved Chloride (Cl-)	2025/10/24	NC	80 - 120	91	80 - 120	ND, RDL=1.0	mg/L	0.026	20		
A037532	Total Suspended Solids	2025/10/23			99	80 - 120	ND, RDL=10	mg/L	NC	20		
A037563	Total Dissolved Solids	2025/10/23			98	80 - 120	ND, RDL=10	mg/L	0.81	20		
A037575	Total Dissolved Solids	2025/10/23			95	80 - 120	ND, RDL=10	mg/L	0.21	20		
A037859	Total Chemical Oxygen Demand (COD)	2025/10/24	105	80 - 120	100	80 - 120	ND, RDL=4.0	mg/L	18	20		
A037943	Total Chemical Oxygen Demand (COD)	2025/10/24	102	80 - 120	97	80 - 120	ND, RDL=4.0	mg/L	11	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).

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.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere

Cristina Carriere, Senior 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.

C5D1451
2025/10/17 11:17

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

NONT-2025-10-4097

Bottle Order #: 1062818

Invoice To:		Report To:		PROJECT INFORMATION:			
Company:	#1192 BluMetric Environmental Inc	Company:	#5638 BluMetric Environmental Inc	Quotation #:	C45785	COC #:	Project Manager:
Attention	Accounts Payable	Attention:	MHH Distribution	P.O. #:		C#1092818-01-01	Deepthi Shaji
Address:	1682 Woodward Drive	Address:	The Tower - The Woolen Mill 4 Cataraqui St	Project:	250253-07		
	Ottawa ON K2C 3R8		Kingston ON K7K 1Z7	Project Name:	Muskow Greenview		
Tel:	(613) 839-3053 Fax: (613) 839-5376	Tel:	(613) 531-2735 Fax:	Site #:			
Email:	ap@blumetric.ca	Email:	cbandler@blumetric.ca, cr..iller@blumetric.ca, edms@bl	Sampled By:	NW / BM		

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 ☐ Agr/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)

Field Filtered (please circle): (Metals / Hg / Cr VI) (DOC)

GW and Leachate - Column 2 (modified) - CCME

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	GW and Leachate - Column 2 (modified) - CCME	# of Bottles	Comments
1		MG-DP1	25/10/16	11:00	GW	✓	✓	7	
2		MG-DP2	25/10/16	11:55	GW	✓	✓	7	
3		MG-DP3	25/10/16	13:00	GW	✓	✓	7	
4		MG-DP4	25/10/16	12:10	GW	✓	✓	6	→Limited sample volume
5		MG-DP5	25/10/16	10:20	GW	✓	✓	7	
6		MG-18-1	25/10/16	12:40	GW	✓	✓	7	
7		~~MG-18-2~~							
8		MG-18-3R	25/10/16	12:25	GW	✓	✓	7	
9		MG-QAQC-GW1	25/10/16	12:40	GW	✓	✓	7	
10									

* Relinquished By (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: Present / Intact	Yes	No
Brad McCallum / BradM	2025/10/16	16:30		2025/10/17	1117			4.5 5.9			

* 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.

Your P.O. #: 250253-07
Your Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your C.O.C. #: 1041558-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/14
Report #: R8538368
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C551495
Received: 2025/05/07, 09:24

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	1	N/A	2025/05/14	CAM SOP-00448	SM 24 2320 B m
Alkalinity	7	N/A	2025/05/09	CAM SOP-00448	SM 24 2320 B m
Biochemical Oxygen Demand (BOD)	8	2025/05/08	2025/05/13	CAM SOP-00427	SM 24 5210B m
Chloride by Automated Colourimetry	4	N/A	2025/05/12	CAM SOP-00463	SM 24 4500-Cl E m
Chloride by Automated Colourimetry	1	N/A	2025/05/14	CAM SOP-00463	SM 24 4500-Cl E m
Chloride by Automated Colourimetry	3	N/A	2025/05/09	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	8	N/A	2025/05/12	CAM SOP-00416	SM 24 5220 D m
Conductivity	8	N/A	2025/05/09	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	8	N/A	2025/05/12	CAM SOP-00446	SM 24 5310 B m
Dissolved Metals by ICPMS	1	N/A	2025/05/14	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	4	N/A	2025/05/08	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	3	N/A	2025/05/09	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	8	N/A	2025/05/12	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	7	N/A	2025/05/10	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Nitrate & Nitrite as Nitrogen in Water (2)	1	N/A	2025/05/09	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	7	2025/05/08	2025/05/09	CAM SOP-00413	SM 24th - 4500H+ B
pH (3)	1	2025/05/09	2025/05/09	CAM SOP-00413	SM 24th - 4500H+ B
Sulphate by Automated Turbidimetry	4	N/A	2025/05/12	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	1	N/A	2025/05/14	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	3	N/A	2025/05/09	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	8	2025/05/12	2025/05/13	CAM SOP-00428	SM 24 2540C m
Total Suspended Solids	5	2025/05/10	2025/05/12	CAM SOP-00428	SM 24 2540D m
Total Suspended Solids	3	2025/05/12	2025/05/13	CAM SOP-00428	SM 24 2540D 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

Your P.O. #: 250253-07
Your Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your C.O.C. #: 1041558-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/14
Report #: R8538368
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C551495

Received: 2025/05/07, 09:24

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) 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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQQC90			AQQC90		
Sampling Date		2025/05/05 13:20			2025/05/05 13:20		
COC Number		1041558-01-01			1041558-01-01		
	UNITS	MG-DP1	RDL	QC Batch	MG-DP1 Lab-Dup	RDL	QC Batch
Inorganics							
Total Ammonia-N	mg/L	0.24	0.050	9926844	0.25	0.050	9926844
Total BOD	mg/L	ND	2	9924652			
Total Chemical Oxygen Demand (COD)	mg/L	7.5	4.0	9926206			
Conductivity	umho/cm	780	2.0	9925145			
Total Dissolved Solids	mg/L	540	10	9926764			
Dissolved Organic Carbon	mg/L	5.2	0.4	9926788			
pH	pH	7.99		9925144			
Total Suspended Solids	mg/L	ND	10	9926430	ND	10	9926430
Dissolved Sulphate (SO4)	mg/L	92	1.0	9925191			
Alkalinity (Total as CaCO3)	mg/L	240	1.0	9925142			
Dissolved Chloride (Cl-)	mg/L	38	1.0	9925189			
Nitrate (N)	mg/L	ND	0.10	9925697	ND	0.10	9925697

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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQQC91		AQQC92			AQQC92		
Sampling Date		2025/05/05 16:05		2025/05/05 14:55			2025/05/05 14:55		
COC Number		1041558-01-01		1041558-01-01			1041558-01-01		
	UNITS	MG-DP2	QC Batch	MG-DP3	RDL	QC Batch	MG-DP3 Lab-Dup	RDL	QC Batch
Inorganics									
Total Ammonia-N	mg/L	6.2	9926844	0.14	0.050	9926844			
Total BOD	mg/L	ND	9924652	ND	2	9924652			
Total Chemical Oxygen Demand (COD)	mg/L	21	9926206	28	4.0	9926206			
Conductivity	umho/cm	340	9925145	1600	2.0	9925583	1600	2.0	9925583
Total Dissolved Solids	mg/L	175	9926764	955	10	9926764			
Dissolved Organic Carbon	mg/L	19	9926788	10	0.4	9926788			
pH	pH	7.77	9925144	7.14		9925584	7.14		9925584
Total Suspended Solids	mg/L	ND	9926779	20	10	9926430			
Dissolved Sulphate (SO4)	mg/L	1.5	9925205	32	1.0	9925191			
Alkalinity (Total as CaCO3)	mg/L	220	9925142	750	1.0	9925578	760	1.0	9925578
Dissolved Chloride (Cl-)	mg/L	1.9	9925202	74	1.0	9925189			
Nitrate (N)	mg/L	ND	9925182	ND	0.10	9925182			

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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQQC93			AQQC94			AQQC94		
Sampling Date		2025/05/05 16:20			2025/05/05 12:15			2025/05/05 12:15		
COC Number		1041558-01-01			1041558-01-01			1041558-01-01		
	UNITS	MG-DP4	RDL	QC Batch	MG-DP5	RDL	QC Batch	MG-DP5 Lab-Dup	RDL	QC Batch
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9926844	0.085	0.050	9926844			
Total BOD	mg/L	32	2	9924652	6	2	9924652			
Total Chemical Oxygen Demand (COD)	mg/L	40	4.0	9926206	41	4.0	9926206			
Conductivity	umho/cm	240	2.0	9925145	820	2.0	9925145			
Total Dissolved Solids	mg/L	125	10	9926764	510	10	9926764			
Dissolved Organic Carbon	mg/L	5.3	0.4	9926788	11	0.4	9926788			
pH	pH	8.21		9925144	7.23		9925144			
Total Suspended Solids	mg/L	240	10	9926430	310	50	9926776			
Dissolved Sulphate (SO4)	mg/L	12	1.0	9925205	40	1.0	9927948	38	1.0	9927948
Alkalinity (Total as CaCO3)	mg/L	98	1.0	9925142	310	1.0	9928274	300	1.0	9928274
Dissolved Chloride (Cl-)	mg/L	5.6	1.0	9925202	57	1.0	9928162	56	1.0	9928162
Nitrate (N)	mg/L	0.14	0.10	9925182	ND	0.10	9925182			

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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQQC95		AQQC96			AQQC97		
Sampling Date		2025/05/05 14:20		2025/05/05 14:00			2025/05/05 14:20		
COC Number		1041558-01-01		1041558-01-01			1041558-01-01		
	UNITS	MG-18-1	QC Batch	MG-18-3R	RDL	QC Batch	MG-QAQC-GW1	RDL	QC Batch
Inorganics									
Total Ammonia-N	mg/L	0.14	9926844	ND	0.050	9926844	0.14	0.050	9926844
Total BOD	mg/L	ND	9924652	ND	2	9924652	ND	2	9924652
Total Chemical Oxygen Demand (COD)	mg/L	9.2	9926206	ND	4.0	9926206	11	4.0	9926206
Conductivity	umho/cm	760	9925145	150	2.0	9925145	770	2.0	9925145
Total Dissolved Solids	mg/L	500	9926764	120	10	9926768	535	10	9926764
Dissolved Organic Carbon	mg/L	5.8	9926788	1.3	0.4	9926788	5.7	0.4	9926788
pH	pH	7.35	9925144	7.48		9925144	7.48		9925144
Total Suspended Solids	mg/L	8600	9926442	11000	200	9926430	8000	100	9926784
Dissolved Sulphate (SO4)	mg/L	13	9925205	6.2	1.0	9925191	13	1.0	9925205
Alkalinity (Total as CaCO3)	mg/L	220	9925142	70	1.0	9925142	220	1.0	9925142
Dissolved Chloride (Cl-)	mg/L	92	9925202	2.0	1.0	9925189	91	1.0	9925202
Nitrate (N)	mg/L	ND	9925182	ND	0.10	9925182	ND	0.10	9925182

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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQQC90	AQQC91	AQQC92	AQQC93		
Sampling Date		2025/05/05 13:20	2025/05/05 16:05	2025/05/05 14:55	2025/05/05 16:20		
COC Number		1041558-01-01	1041558-01-01	1041558-01-01	1041558-01-01		
	UNITS	MG-DP1	MG-DP2	MG-DP3	MG-DP4	RDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L	ND	ND	ND	6.2	4.9	9924665
Dissolved Barium (Ba)	ug/L	73	32	190	13	2.0	9924665
Dissolved Boron (B)	ug/L	57	28	620	18	10	9924665
Dissolved Cadmium (Cd)	ug/L	ND	ND	ND	ND	0.090	9924665
Dissolved Calcium (Ca)	ug/L	140000	48000	270000	33000	200	9924665
Dissolved Chromium (Cr)	ug/L	ND	ND	ND	ND	5.0	9924665
Dissolved Cobalt (Co)	ug/L	ND	ND	5.5	ND	0.50	9924665
Dissolved Iron (Fe)	ug/L	ND	ND	610	ND	100	9924665
Dissolved Lead (Pb)	ug/L	ND	ND	ND	ND	0.50	9924665
Dissolved Magnesium (Mg)	ug/L	11000	4100	36000	5100	50	9924665
Dissolved Manganese (Mn)	ug/L	140	71	430	ND	2.0	9924665
Dissolved Silver (Ag)	ug/L	ND	ND	ND	ND	0.090	9924665
Dissolved Sodium (Na)	ug/L	13000	4800	59000	4800	100	9924665
Dissolved Zinc (Zn)	ug/L	ND	ND	ND	ND	5.0	9924665

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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQQC94	AQQC94			AQQC95	AQQC96		
Sampling Date		2025/05/05 12:15	2025/05/05 12:15			2025/05/05 14:20	2025/05/05 14:00		
COC Number		1041558-01-01	1041558-01-01			1041558-01-01	1041558-01-01		
	UNITS	MG-DP5	MG-DP5 Lab-Dup	RDL	QC Batch	MG-18-1	MG-18-3R	RDL	QC Batch
Metals									
Dissolved Aluminum (Al)	ug/L	ND	ND	4.9	9928360	ND	ND	4.9	9924667
Dissolved Barium (Ba)	ug/L	37	36	2.0	9928360	93	19	2.0	9924667
Dissolved Boron (B)	ug/L	60	60	10	9928360	130	ND	10	9924667
Dissolved Cadmium (Cd)	ug/L	ND	ND	0.090	9928360	ND	ND	0.090	9924667
Dissolved Calcium (Ca)	ug/L	120000	120000	200	9928360	85000	24000	200	9924667
Dissolved Chromium (Cr)	ug/L	ND	ND	5.0	9928360	ND	ND	5.0	9924667
Dissolved Cobalt (Co)	ug/L	31	31	0.50	9928360	33	ND	0.50	9924667
Dissolved Iron (Fe)	ug/L	170000	170000	500	9928360	670	ND	100	9924667
Dissolved Lead (Pb)	ug/L	ND	ND	0.50	9928360	ND	ND	0.50	9924667
Dissolved Magnesium (Mg)	ug/L	11000	11000	50	9928360	20000	1500	50	9924667
Dissolved Manganese (Mn)	ug/L	1900	1900	2.0	9928360	5800	35	2.0	9924667
Dissolved Silver (Ag)	ug/L	ND	ND	0.090	9928360	ND	ND	0.090	9924667
Dissolved Sodium (Na)	ug/L	7800	7800	100	9928360	25000	3100	100	9924667
Dissolved Zinc (Zn)	ug/L	32000	32000	25	9928360	ND	ND	5.0	9924667

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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQQC97		
Sampling Date		2025/05/05 14:20		
COC Number		1041558-01-01		
	UNITS	MG-QAQC-GW1	RDL	QC Batch
Metals				
Dissolved Aluminum (Al)	ug/L	ND	4.9	9924667
Dissolved Barium (Ba)	ug/L	90	2.0	9924667
Dissolved Boron (B)	ug/L	130	10	9924667
Dissolved Cadmium (Cd)	ug/L	ND	0.090	9924667
Dissolved Calcium (Ca)	ug/L	86000	200	9924667
Dissolved Chromium (Cr)	ug/L	ND	5.0	9924667
Dissolved Cobalt (Co)	ug/L	33	0.50	9924667
Dissolved Iron (Fe)	ug/L	670	100	9924667
Dissolved Lead (Pb)	ug/L	ND	0.50	9924667
Dissolved Magnesium (Mg)	ug/L	20000	50	9924667
Dissolved Manganese (Mn)	ug/L	5800	2.0	9924667
Dissolved Silver (Ag)	ug/L	ND	0.090	9924667
Dissolved Sodium (Na)	ug/L	25000	100	9924667
Dissolved Zinc (Zn)	ug/L	ND	5.0	9924667

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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

TEST SUMMARY

Bureau Veritas ID: AQQC90
Sample ID: MG-DP1
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9925142	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924652	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9925189	N/A	2025/05/09	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9926206	N/A	2025/05/12	Kruti Jitesh Patel
Conductivity	AT	9925145	N/A	2025/05/09	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9926788	N/A	2025/05/12	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	9924665	N/A	2025/05/08	Prempal Bhatti
Total Ammonia-N	SKAL/NH4	9926844	N/A	2025/05/12	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925697	N/A	2025/05/09	Helen He
pH	AT	9925144	2025/05/08	2025/05/09	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9925191	N/A	2025/05/09	Alina Dobreanu
Total Dissolved Solids	BAL	9926764	2025/05/12	2025/05/13	Binuja Kodithuwakku Arachchilage
Total Suspended Solids	BAL	9926430	2025/05/10	2025/05/12	Tina Teng

Bureau Veritas ID: AQQC90 Dup
Sample ID: MG-DP1
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	SKAL/NH4	9926844	N/A	2025/05/12	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925697	N/A	2025/05/09	Helen He
Total Suspended Solids	BAL	9926430	2025/05/10	2025/05/12	Tina Teng

Bureau Veritas ID: AQQC91
Sample ID: MG-DP2
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9925142	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924652	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9925202	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9926206	N/A	2025/05/12	Kruti Jitesh Patel
Conductivity	AT	9925145	N/A	2025/05/09	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9926788	N/A	2025/05/12	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	9924665	N/A	2025/05/08	Prempal Bhatti
Total Ammonia-N	SKAL/NH4	9926844	N/A	2025/05/12	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925182	N/A	2025/05/10	Helen He
pH	AT	9925144	2025/05/08	2025/05/09	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9925205	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926764	2025/05/12	2025/05/13	Binuja Kodithuwakku Arachchilage
Total Suspended Solids	BAL	9926779	2025/05/12	2025/05/13	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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

TEST SUMMARY

Bureau Veritas ID: AQQC92
Sample ID: MG-DP3
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9925578	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924652	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9925189	N/A	2025/05/09	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9926206	N/A	2025/05/12	Kruti Jitesh Patel
Conductivity	AT	9925583	N/A	2025/05/09	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9926788	N/A	2025/05/12	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	9924665	N/A	2025/05/08	Prempal Bhatti
Total Ammonia-N	SKAL/NH4	9926844	N/A	2025/05/12	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925182	N/A	2025/05/10	Helen He
pH	AT	9925584	2025/05/09	2025/05/09	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9925191	N/A	2025/05/09	Alina Dobreanu
Total Dissolved Solids	BAL	9926764	2025/05/12	2025/05/13	Binuja Kodithuwakku Arachchilage
Total Suspended Solids	BAL	9926430	2025/05/10	2025/05/12	Tina Teng

Bureau Veritas ID: AQQC92 Dup
Sample ID: MG-DP3
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9925578	N/A	2025/05/09	Nachiketa Gohil
Conductivity	AT	9925583	N/A	2025/05/09	Nachiketa Gohil
pH	AT	9925584	2025/05/09	2025/05/09	Nachiketa Gohil

Bureau Veritas ID: AQQC93
Sample ID: MG-DP4
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9925142	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924652	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9925202	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9926206	N/A	2025/05/12	Kruti Jitesh Patel
Conductivity	AT	9925145	N/A	2025/05/09	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9926788	N/A	2025/05/12	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	9924665	N/A	2025/05/08	Prempal Bhatti
Total Ammonia-N	SKAL/NH4	9926844	N/A	2025/05/12	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925182	N/A	2025/05/10	Helen He
pH	AT	9925144	2025/05/08	2025/05/09	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9925205	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926764	2025/05/12	2025/05/13	Binuja Kodithuwakku Arachchilage
Total Suspended Solids	BAL	9926430	2025/05/10	2025/05/12	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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

TEST SUMMARY

Bureau Veritas ID: AQQC94
Sample ID: MG-DP5
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9928274	N/A	2025/05/14	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924652	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9928162	N/A	2025/05/14	Massarat Jan
Chemical Oxygen Demand	SPEC	9926206	N/A	2025/05/12	Kruti Jitesh Patel
Conductivity	AT	9925145	N/A	2025/05/09	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9926788	N/A	2025/05/12	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	9928360	N/A	2025/05/14	Nan Raykha
Total Ammonia-N	SKAL/NH4	9926844	N/A	2025/05/12	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925182	N/A	2025/05/10	Helen He
pH	AT	9925144	2025/05/08	2025/05/09	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9927948	N/A	2025/05/14	Massarat Jan
Total Dissolved Solids	BAL	9926764	2025/05/12	2025/05/13	Binuja Kodithuwakku Arachchilage
Total Suspended Solids	BAL	9926776	2025/05/12	2025/05/13	Tina Teng

Bureau Veritas ID: AQQC94 Dup
Sample ID: MG-DP5
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9928274	N/A	2025/05/14	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9928162	N/A	2025/05/14	Massarat Jan
Dissolved Metals by ICPMS	ICP/MS	9928360	N/A	2025/05/14	Nan Raykha
Sulphate by Automated Turbidimetry	SKAL	9927948	N/A	2025/05/14	Massarat Jan

Bureau Veritas ID: AQQC95
Sample ID: MG-18-1
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9925142	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924652	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9925202	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9926206	N/A	2025/05/12	Kruti Jitesh Patel
Conductivity	AT	9925145	N/A	2025/05/09	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9926788	N/A	2025/05/12	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	9924667	N/A	2025/05/09	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9926844	N/A	2025/05/12	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925182	N/A	2025/05/10	Helen He
pH	AT	9925144	2025/05/08	2025/05/09	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9925205	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926764	2025/05/12	2025/05/13	Binuja Kodithuwakku Arachchilage
Total Suspended Solids	BAL	9926442	2025/05/10	2025/05/12	Madhav Somani

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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

TEST SUMMARY

Bureau Veritas ID: AQQC96
Sample ID: MG-18-3R
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9925142	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924652	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9925189	N/A	2025/05/09	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9926206	N/A	2025/05/12	Kruti Jitesh Patel
Conductivity	AT	9925145	N/A	2025/05/09	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9926788	N/A	2025/05/12	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	9924667	N/A	2025/05/09	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9926844	N/A	2025/05/12	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925182	N/A	2025/05/10	Helen He
pH	AT	9925144	2025/05/08	2025/05/09	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9925191	N/A	2025/05/09	Alina Dobreanu
Total Dissolved Solids	BAL	9926768	2025/05/12	2025/05/13	Tina Teng
Total Suspended Solids	BAL	9926430	2025/05/10	2025/05/12	Tina Teng

Bureau Veritas ID: AQQC97
Sample ID: MG-QAQC-GW1
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9925142	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924652	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9925202	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9926206	N/A	2025/05/12	Kruti Jitesh Patel
Conductivity	AT	9925145	N/A	2025/05/09	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9926788	N/A	2025/05/12	Gyulshen Idriz
Dissolved Metals by ICPMS	ICP/MS	9924667	N/A	2025/05/09	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9926844	N/A	2025/05/12	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925182	N/A	2025/05/10	Helen He
pH	AT	9925144	2025/05/08	2025/05/09	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9925205	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926764	2025/05/12	2025/05/13	Binuja Kodithuwakku Arachchilage
Total Suspended Solids	BAL	9926784	2025/05/12	2025/05/13	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.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.3°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 #: C551495
Report Date: 2025/05/14

QUALITY ASSURANCE REPORT

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
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
9924652	Total BOD	2025/05/13					ND,RDL=2	mg/L	NC	30	94	80 - 120
9924665	Dissolved Aluminum (Al)	2025/05/08	114	80 - 120	99	80 - 120	ND, RDL=4.9	ug/L				
9924665	Dissolved Barium (Ba)	2025/05/09	NC	80 - 120	100	80 - 120	ND, RDL=2.0	ug/L	1.4	20		
9924665	Dissolved Boron (B)	2025/05/09	94	80 - 120	92	80 - 120	ND, RDL=10	ug/L	2.7	20		
9924665	Dissolved Cadmium (Cd)	2025/05/09	102	80 - 120	100	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9924665	Dissolved Calcium (Ca)	2025/05/08	NC	80 - 120	99	80 - 120	ND, RDL=200	ug/L				
9924665	Dissolved Chromium (Cr)	2025/05/09	105	80 - 120	101	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9924665	Dissolved Cobalt (Co)	2025/05/09	103	80 - 120	101	80 - 120	ND, RDL=0.50	ug/L	3.0	20		
9924665	Dissolved Iron (Fe)	2025/05/08	102	80 - 120	100	80 - 120	ND, RDL=100	ug/L				
9924665	Dissolved Lead (Pb)	2025/05/09	97	80 - 120	99	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9924665	Dissolved Magnesium (Mg)	2025/05/08	NC	80 - 120	99	80 - 120	ND, RDL=50	ug/L				
9924665	Dissolved Manganese (Mn)	2025/05/08	105	80 - 120	101	80 - 120	ND, RDL=2.0	ug/L				
9924665	Dissolved Silver (Ag)	2025/05/09	96	80 - 120	100	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9924665	Dissolved Sodium (Na)	2025/05/09	NC	80 - 120	100	80 - 120	ND, RDL=100	ug/L	0.29	20		
9924665	Dissolved Zinc (Zn)	2025/05/09	98	80 - 120	103	80 - 120	ND, RDL=5.0	ug/L	8.6	20		
9924667	Dissolved Aluminum (Al)	2025/05/09	102	80 - 120	101	80 - 120	ND, RDL=4.9	ug/L				
9924667	Dissolved Barium (Ba)	2025/05/09	101	80 - 120	102	80 - 120	ND, RDL=2.0	ug/L	4.9	20		
9924667	Dissolved Boron (B)	2025/05/09	96	80 - 120	92	80 - 120	ND, RDL=10	ug/L	NC	20		
9924667	Dissolved Cadmium (Cd)	2025/05/09	101	80 - 120	100	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9924667	Dissolved Calcium (Ca)	2025/05/09	NC	80 - 120	102	80 - 120	ND, RDL=200	ug/L				
9924667	Dissolved Chromium (Cr)	2025/05/09	98	80 - 120	98	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9924667	Dissolved Cobalt (Co)	2025/05/09	100	80 - 120	102	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9924667	Dissolved Iron (Fe)	2025/05/09	100	80 - 120	102	80 - 120	ND, RDL=100	ug/L				
9924667	Dissolved Lead (Pb)	2025/05/09	95	80 - 120	96	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9924667	Dissolved Magnesium (Mg)	2025/05/09	100	80 - 120	100	80 - 120	ND, RDL=50	ug/L				
9924667	Dissolved Manganese (Mn)	2025/05/09	98	80 - 120	101	80 - 120	ND, RDL=2.0	ug/L				
9924667	Dissolved Silver (Ag)	2025/05/09	91	80 - 120	95	80 - 120	ND, RDL=0.090	ug/L	NC	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
9924667	Dissolved Sodium (Na)	2025/05/09	99	80 - 120	100	80 - 120	ND, RDL=100	ug/L	3.8	20		
9924667	Dissolved Zinc (Zn)	2025/05/09	99	80 - 120	100	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9925142	Alkalinity (Total as CaCO3)	2025/05/09			98	85 - 115	ND, RDL=1.0	mg/L	1.9	20		
9925144	pH	2025/05/09			102	98 - 103			0.74	N/A		
9925145	Conductivity	2025/05/09			100	85 - 115	ND, RDL=2.0	umho/cm	0	10		
9925182	Nitrate (N)	2025/05/10	NC	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	0.62	20		
9925189	Dissolved Chloride (Cl-)	2025/05/09	86	80 - 120	102	80 - 120	ND, RDL=1.0	mg/L	1.3	20		
9925191	Dissolved Sulphate (SO4)	2025/05/09	86	75 - 125	98	80 - 120	ND, RDL=1.0	mg/L	NC	20		
9925202	Dissolved Chloride (Cl-)	2025/05/12	NC	80 - 120	100	80 - 120	ND, RDL=1.0	mg/L	1.1	20		
9925205	Dissolved Sulphate (SO4)	2025/05/12	89	75 - 125	99	80 - 120	ND, RDL=1.0	mg/L	0.42	20		
9925578	Alkalinity (Total as CaCO3)	2025/05/09			96	85 - 115	ND, RDL=1.0	mg/L	2.6	20		
9925583	Conductivity	2025/05/09			99	85 - 115	ND, RDL=2.0	umho/cm	0.50	10		
9925584	pH	2025/05/09			102	98 - 103			0.029	N/A		
9925697	Nitrate (N)	2025/05/09	95	80 - 120	96	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9926206	Total Chemical Oxygen Demand (COD)	2025/05/12	103	80 - 120	102	80 - 120	ND, RDL=4.0	mg/L	NC	20		
9926430	Total Suspended Solids	2025/05/12			94	80 - 120	ND, RDL=10	mg/L	NC	20		
9926442	Total Suspended Solids	2025/05/12			98	80 - 120	ND, RDL=10	mg/L	8.5	20		
9926764	Total Dissolved Solids	2025/05/13			97	80 - 120	ND, RDL=10	mg/L	0.59	20		
9926768	Total Dissolved Solids	2025/05/13			93	80 - 120	ND, RDL=10	mg/L	0.34	20		
9926776	Total Suspended Solids	2025/05/13			94	80 - 120	ND, RDL=10	mg/L	NC	20		
9926779	Total Suspended Solids	2025/05/13			99	80 - 120	ND, RDL=10	mg/L	NC	20		
9926784	Total Suspended Solids	2025/05/13			95	80 - 120	ND, RDL=10	mg/L	NC	20		
9926788	Dissolved Organic Carbon	2025/05/12	97	80 - 120	96	80 - 120	ND, RDL=0.4	mg/L	2.7	20		
9926844	Total Ammonia-N	2025/05/12	109	75 - 125	105	80 - 120	ND, RDL=0.050	mg/L	3.3	20		
9927948	Dissolved Sulphate (SO4)	2025/05/14	NC	75 - 125	102	80 - 120	ND, RDL=1.0	mg/L	1.5	20		
9928162	Dissolved Chloride (Cl-)	2025/05/14	NC	80 - 120	102	80 - 120	ND, RDL=1.0	mg/L	0.88	20		
9928274	Alkalinity (Total as CaCO3)	2025/05/14			96	85 - 115	ND, RDL=1.0	mg/L	0.47	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
9928360	Dissolved Aluminum (Al)	2025/05/14	98	80 - 120	99	80 - 120	ND, RDL=4.9	ug/L	NC	20		
9928360	Dissolved Barium (Ba)	2025/05/14	98	80 - 120	97	80 - 120	ND, RDL=2.0	ug/L	4.1	20		
9928360	Dissolved Boron (B)	2025/05/14	96	80 - 120	99	80 - 120	ND, RDL=10	ug/L	0.72	20		
9928360	Dissolved Cadmium (Cd)	2025/05/14	98	80 - 120	97	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9928360	Dissolved Calcium (Ca)	2025/05/14	NC	80 - 120	99	80 - 120	ND, RDL=200	ug/L	2.1	20		
9928360	Dissolved Chromium (Cr)	2025/05/14	96	80 - 120	96	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9928360	Dissolved Cobalt (Co)	2025/05/14	90	80 - 120	99	80 - 120	ND, RDL=0.50	ug/L	0.35	20		
9928360	Dissolved Iron (Fe)	2025/05/14	NC	80 - 120	98	80 - 120	ND, RDL=100	ug/L	0.94	20		
9928360	Dissolved Lead (Pb)	2025/05/14	97	80 - 120	97	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9928360	Dissolved Magnesium (Mg)	2025/05/14	95	80 - 120	97	80 - 120	ND, RDL=50	ug/L	1.1	20		
9928360	Dissolved Manganese (Mn)	2025/05/14	NC	80 - 120	98	80 - 120	ND, RDL=2.0	ug/L	0.31	20		
9928360	Dissolved Silver (Ag)	2025/05/14	69 (1)	80 - 120	96	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9928360	Dissolved Sodium (Na)	2025/05/14	96	80 - 120	100	80 - 120	ND, RDL=100	ug/L	1.2	20		
9928360	Dissolved Zinc (Zn)	2025/05/14	NC	80 - 120	99	80 - 120	ND, RDL=5.0	ug/L	0.62	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) 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 #: C551495
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: NW

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.

C551495
2025/05/07 09:24

Page 1 of 1

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 #:	C45785	Bureau Veritas Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	S'rana Scholes	P.O. #:	250253-07		1041558
Address:	1682 Woodward Drive Ottawa ON K2C 3R8	Address:	The Tower - The Woolen Mill 4 Cataraqui St Kingston ON K7K 1Z7	Project:	250253-07	COC #:	Project Manager:
Tel:	(613) 839-3053 Fax: (613) 839-5376	Tel:	(613) 531-2725 Fax:	Project Name:		C#1041558-01-01	Deepthi Shaji
Email:	ap@blumetric.ca	Email:	sscholes@blumetric.ca, cbandler@blumetric.ca, edms	Site #:	Musclow Greenview		
				Sampled By:	NW & BM		

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 (DOC)	GW and Leachate - Column 2 (modified) - ODWS									# of Bottles	Comments
1		MG-DP1	25/05/05	13:20	GW	✓	✓									7	
2		MG-DP2	25/05/05	16:05	GW	✓	✓									7	
3		MG-DP3	25/05/05	14:55	GW	✓	✓									7	
4		MG-DP4	25/05/05	16:20	GW	✓	✓									7	
5		MG-DP5	25/05/05	12:15	GW	✓	✓									7	
6		MG-18-1	25/05/05	14:20	GW	✓	✓									7	
7		MG-18-2															NONT-2025-05-1226
8		MG-18-3R	25/05/05	14:00	GW	✓	✓									7	
9		MG-QAQC-GW1	25/05/05	14:20	GW	✓	✓									7	
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	25/05/06	08:00	Bhavjotkaur BHAVJOT KAUR	2025/05/07	09:24	

Laboratory Use Only Ice Y

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	5/4/1	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 (Including Toxicity)

Your Project #: 250253-07
Site Location: Musclow Greenview
Your C.O.C. #: C#1062823-01-01

Attention: MHH Distribution

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/10/27
Report #: R8639282
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C5D1417
Received: 2025/10/17, 11:12

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	3	N/A	2025/10/23	CAM SOP-00447	EPA 6020B m
Alkalinity	3	N/A	2025/10/25	CAM SOP-00448	SM 24 2320 B m
Biochemical Oxygen Demand (BOD)	3	2025/10/20	2025/10/25	CAM SOP-00427	SM 24 5210B m
Chloride by Automated Colourimetry	3	N/A	2025/10/24	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	3	N/A	2025/10/24	CAM SOP-00416	SM 24 5220 D m
Conductivity	3	N/A	2025/10/25	CAM SOP-00414	SM 24 2510 m
Hardness (calculated as CaCO3)	3	N/A	2025/10/23	CAM SOP 00102/00408/00447	SM 2340 B
Total Metals Analysis by ICPMS	3	2025/10/23	2025/10/23	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	3	N/A	2025/10/23	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	3	N/A	2025/10/21	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (2)	3	2025/10/21	2025/10/25	CAM SOP-00413	SM 24th - 4500H+ B
Phenols (4AAP)	3	N/A	2025/10/22	CAM SOP-00444	OMOE E3179 m
Field Measured pH (3)	3	N/A	2025/10/18		Field pH Meter
Sulphate by Automated Turbidimetry	3	N/A	2025/10/24	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	3	2025/10/22	2025/10/23	CAM SOP-00428	SM 24 2540C m
Field Temperature (3)	3	N/A	2025/10/18		Field Thermometer
Total Kjeldahl Nitrogen in Water	3	2025/10/22	2025/10/24	CAM SOP-00938	SM 4500-N B m
Total Phosphorus (Colourimetric)	3	2025/10/22	2025/10/22	CAM SOP-00407	SM 24 4500-P I
Total Suspended Solids	3	2025/10/22	2025/10/22	CAM SOP-00428	SM 24 2540D m
Un-ionized Ammonia (4)	3	2025/10/18	2025/10/23	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.

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 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.

Your Project #: 250253-07
Site Location: Musclow Greenview
Your C.O.C. #: C#1062823-01-01

Attention: MHH Distribution

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/10/27
Report #: R8639282
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C5D1417
Received: 2025/10/17, 11:12

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.

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 #: C5D1417
Report Date: 2025/10/27

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AWIW94			AWIW94		
Sampling Date		2025/10/16 09:45			2025/10/16 09:45		
COC Number		C#1062823-01-01			C#1062823-01-01		
	UNITS	MG-SW4A	RDL	QC Batch	MG-SW4A Lab-Dup	RDL	QC Batch
Calculated Parameters							
Hardness (CaCO3)	mg/L	62	1.0	A035092			
Total Un-ionized Ammonia	mg/L	ND	0.00061	A035118			
Field Measurements							
Field Temperature	Celsius	4.3	N/A	ONSITE			
Field Measured pH	pH	6.96		ONSITE			
Inorganics							
Total Ammonia-N	mg/L	0.052	0.050	A037585	0.061	0.050	A037585
Total BOD	mg/L	2	2	A035752			
Total Chemical Oxygen Demand (COD)	mg/L	21	4.0	A037628			
Conductivity	umho/cm	150	2.0	A036412			
Total Dissolved Solids	mg/L	100	10	A037575			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.48	0.10	A037837			
pH	pH	7.31		A036413			
Phenols-4AAP	mg/L	0.0012	0.0010	A037630			
Total Phosphorus	mg/L	0.063	0.020	A037561			
Total Suspended Solids	mg/L	22	10	A037451			
Dissolved Sulphate (SO4)	mg/L	2.4	1.0	A036856			
Alkalinity (Total as CaCO3)	mg/L	56	1.0	A036406			
Dissolved Chloride (Cl-)	mg/L	9.3	1.0	A036854			
Nitrite (N)	mg/L	ND	0.010	A036742			
Nitrate (N)	mg/L	ND	0.10	A036742			
Nitrate + Nitrite (N)	mg/L	ND	0.10	A036742			

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

Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C5D1417
Report Date: 2025/10/27

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AWIW95	AWIW96		
Sampling Date		2025/10/16 10:35	2025/10/16 09:45		
COC Number		C#1062823-01-01	C#1062823-01-01		
	UNITS	MG-SW7	MG-QAQC-SW1	RDL	QC Batch
Calculated Parameters					
Hardness (CaCO3)	mg/L	96	61	1.0	A035092
Total Un-ionized Ammonia	mg/L	ND	ND	0.00061	A035118
Field Measurements					
Field Temperature	Celsius	5.0	4.3	N/A	ONSITE
Field Measured pH	pH	7.29	6.96		ONSITE
Inorganics					
Total Ammonia-N	mg/L	0.13	0.054	0.050	A037585
Total BOD	mg/L	ND	2	2	A035752
Total Chemical Oxygen Demand (COD)	mg/L	9.0	20	4.0	A037628
Conductivity	umho/cm	210	150	2.0	A036412
Total Dissolved Solids	mg/L	145	90	10	A037575
Total Kjeldahl Nitrogen (TKN)	mg/L	0.38	0.42	0.10	A037837
pH	pH	7.63	7.27		A036413
Phenols-4AAP	mg/L	ND	0.0010	0.0010	A037630
Total Phosphorus	mg/L	0.050	0.050	0.020	A037561
Total Suspended Solids	mg/L	22	ND	10	A037451
Dissolved Sulphate (SO4)	mg/L	10	2.4	1.0	A036856
Alkalinity (Total as CaCO3)	mg/L	88	56	1.0	A036406
Dissolved Chloride (Cl-)	mg/L	4.5	8.8	1.0	A036854
Nitrite (N)	mg/L	ND	ND	0.010	A036742
Nitrate (N)	mg/L	ND	ND	0.10	A036742
Nitrate + Nitrite (N)	mg/L	ND	ND	0.10	A036742

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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

Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C5D1417
Report Date: 2025/10/27

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AWIW94	AWIW95			AWIW95		
Sampling Date		2025/10/16 09:45	2025/10/16 10:35			2025/10/16 10:35		
COC Number		C#1062823-01-01	C#1062823-01-01			C#1062823-01-01		
	UNITS	MG-SW4A	MG-SW7	RDL	QC Batch	MG-SW7 Lab-Dup	RDL	QC Batch
Metals								
Dissolved (0.2u) Aluminum (Al)	ug/L	31	6	5	A037813	6	5	A037813
Total Barium (Ba)	ug/L	23	25	2.0	A038237			
Total Boron (B)	ug/L	ND	ND	10	A038237			
Total Cadmium (Cd)	ug/L	ND	ND	0.090	A038237			
Total Calcium (Ca)	ug/L	21000	34000	200	A038237			
Total Cobalt (Co)	ug/L	0.93	ND	0.50	A038237			
Total Copper (Cu)	ug/L	ND	ND	0.90	A038237			
Total Iron (Fe)	ug/L	3400	3400	100	A038237			
Total Lead (Pb)	ug/L	ND	ND	0.50	A038237			
Total Magnesium (Mg)	ug/L	3400	3800	50	A038237			
Total Manganese (Mn)	ug/L	460	220	2.0	A038237			
Total Potassium (K)	ug/L	2100	2200	200	A038237			
Total Sodium (Na)	ug/L	4300	3900	100	A038237			
Total Zinc (Zn)	ug/L	ND	ND	5.0	A038237			

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.

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AWIW96		
Sampling Date		2025/10/16 09:45		
COC Number		C#1062823-01-01		
	UNITS	MG-QAQC-SW1	RDL	QC Batch
Metals				
Dissolved (0.2u) Aluminum (Al)	ug/L	30	5	A037813
Total Barium (Ba)	ug/L	22	2.0	A038237
Total Boron (B)	ug/L	ND	10	A038237
Total Cadmium (Cd)	ug/L	ND	0.090	A038237
Total Calcium (Ca)	ug/L	21000	200	A038237
Total Cobalt (Co)	ug/L	1.1	0.50	A038237
Total Copper (Cu)	ug/L	ND	0.90	A038237
Total Iron (Fe)	ug/L	2900	100	A038237
Total Lead (Pb)	ug/L	ND	0.50	A038237
Total Magnesium (Mg)	ug/L	3500	50	A038237
Total Manganese (Mn)	ug/L	450	2.0	A038237
Total Potassium (K)	ug/L	2200	200	A038237
Total Sodium (Na)	ug/L	4400	100	A038237
Total Zinc (Zn)	ug/L	ND	5.0	A038237

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 #: C5D1417
Report Date: 2025/10/27

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AWIW94
Sample ID: MG-SW4A
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	A037813	N/A	2025/10/23	Azita Fazaeli
Alkalinity	AT	A036406	N/A	2025/10/25	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035752	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A036854	N/A	2025/10/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037628	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/25	Surinder Rai
Hardness (calculated as CaCO3)		A035092	N/A	2025/10/23	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	A038237	2025/10/23	2025/10/23	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	A037585	N/A	2025/10/23	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036742	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	A037630	N/A	2025/10/22	Jency Sara Johnson
Field Measured pH	PH	ONSITE	N/A	2025/10/18	Maharshi Prajapati
Sulphate by Automated Turbidimetry	SKAL	A036856	N/A	2025/10/24	Massarat Jan
Total Dissolved Solids	BAL	A037575	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA
Field Measured pH	PH	ONSITE	N/A	2025/10/18	Maharshi Prajapati
Total Kjeldahl Nitrogen in Water	SKAL	A037837	2025/10/22	2025/10/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	A037561	2025/10/22	2025/10/22	Sachi Patel
Total Suspended Solids	BAL	A037451	2025/10/22	2025/10/22	Hiu Fung Yan (James)
Un-ionized Ammonia	CALC/NH3	A035118	2025/10/23	2025/10/23	Automated Statchk

Bureau Veritas ID: AWIW94 Dup
Sample ID: MG-SW4A
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	SKAL/NH4	A037585	N/A	2025/10/23	Kruti Jitesh Patel

Bureau Veritas ID: AWIW95
Sample ID: MG-SW7
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	A037813	N/A	2025/10/23	Azita Fazaeli
Alkalinity	AT	A036406	N/A	2025/10/25	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035752	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A036854	N/A	2025/10/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037628	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/25	Surinder Rai
Hardness (calculated as CaCO3)		A035092	N/A	2025/10/23	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	A038237	2025/10/23	2025/10/23	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	A037585	N/A	2025/10/23	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036742	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/25	Surinder Rai

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 #: C5D1417
Report Date: 2025/10/27

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AWIW95
Sample ID: MG-SW7
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	A037630	N/A	2025/10/22	Jency Sara Johnson
Field Measured pH	PH	ONSITE	N/A	2025/10/18	Maharshi Prajapati
Sulphate by Automated Turbidimetry	SKAL	A036856	N/A	2025/10/24	Massarat Jan
Total Dissolved Solids	BAL	A037575	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA
Field Measured pH	PH	ONSITE	N/A	2025/10/18	Maharshi Prajapati
Total Kjeldahl Nitrogen in Water	SKAL	A037837	2025/10/22	2025/10/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	A037561	2025/10/22	2025/10/22	Sachi Patel
Total Suspended Solids	BAL	A037451	2025/10/22	2025/10/22	Hiu Fung Yan (James)
Un-ionized Ammonia	CALC/NH3	A035118	2025/10/23	2025/10/23	Automated Statchk

Bureau Veritas ID: AWIW95 Dup
Sample ID: MG-SW7
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	A037813	N/A	2025/10/23	Azita Fazaeli

Bureau Veritas ID: AWIW96
Sample ID: MG-QAQC-SW1
Matrix: Water

Collected: 2025/10/16
Shipped:
Received: 2025/10/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	A037813	N/A	2025/10/23	Azita Fazaeli
Alkalinity	AT	A036406	N/A	2025/10/25	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	A035752	2025/10/20	2025/10/25	Frank Zhang
Chloride by Automated Colourimetry	SKAL	A036854	N/A	2025/10/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	A037628	N/A	2025/10/24	Arshdeep Jagayat
Conductivity	AT	A036412	N/A	2025/10/25	Surinder Rai
Hardness (calculated as CaCO3)		A035092	N/A	2025/10/23	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	A038237	2025/10/23	2025/10/23	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	A037585	N/A	2025/10/23	Kruti Jitesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	A036742	N/A	2025/10/21	Chandra Nandlal
pH	AT	A036413	2025/10/21	2025/10/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	A037630	N/A	2025/10/22	Jency Sara Johnson
Field Measured pH	PH	ONSITE	N/A	2025/10/18	Maharshi Prajapati
Sulphate by Automated Turbidimetry	SKAL	A036856	N/A	2025/10/24	Massarat Jan
Total Dissolved Solids	BAL	A037575	2025/10/22	2025/10/23	Manowalage shanika GUNASEKARA
Field Measured pH	PH	ONSITE	N/A	2025/10/18	Maharshi Prajapati
Total Kjeldahl Nitrogen in Water	SKAL	A037837	2025/10/22	2025/10/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	A037561	2025/10/22	2025/10/22	Sachi Patel
Total Suspended Solids	BAL	A037451	2025/10/22	2025/10/22	Hiu Fung Yan (James)
Un-ionized Ammonia	CALC/NH3	A035118	2025/10/23	2025/10/23	Automated Statchk

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	4.7°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

Bureau Veritas Job #: C5D1417
Report Date: 2025/10/27

QUALITY ASSURANCE REPORT

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

			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
A035752	Total BOD	2025/10/25					ND,RDL=2	mg/L	5.9	30	93	80 - 120
A036406	Alkalinity (Total as CaCO3)	2025/10/24			97	85 - 115	ND, RDL=1.0	mg/L	2.3	20		
A036412	Conductivity	2025/10/24			99	85 - 115	ND, RDL=2.0	umho/cm	0.53	10		
A036413	pH	2025/10/24			102	98 - 103			0.53	N/A		
A036742	Nitrate (N)	2025/10/21	91	80 - 120	92	80 - 120	ND, RDL=0.10	mg/L	0.39	20		
A036742	Nitrite (N)	2025/10/21	104	80 - 120	104	80 - 120	ND, RDL=0.010	mg/L	NC	20		
A036854	Dissolved Chloride (Cl-)	2025/10/24	NC	80 - 120	94	80 - 120	ND, RDL=1.0	mg/L	1.7	20		
A036856	Dissolved Sulphate (SO4)	2025/10/24	91	75 - 125	99	80 - 120	ND, RDL=1.0	mg/L	2.9	20		
A037451	Total Suspended Solids	2025/10/22			97	80 - 120	ND, RDL=10	mg/L	1.4	20		
A037561	Total Phosphorus	2025/10/22	96	80 - 120	100	80 - 120	ND, RDL=0.020	mg/L	2.1	20	92	80 - 120
A037575	Total Dissolved Solids	2025/10/23			95	80 - 120	ND, RDL=10	mg/L	0.21	20		
A037585	Total Ammonia-N	2025/10/23	104	75 - 125	97	80 - 120	ND, RDL=0.050	mg/L	16	20		
A037628	Total Chemical Oxygen Demand (COD)	2025/10/24	99	80 - 120	99	80 - 120	ND, RDL=4.0	mg/L	4.2	20		
A037630	Phenols-4AAP	2025/10/22	97	80 - 120	100	80 - 120	ND, RDL=0.0010	mg/L	NC	20		
A037813	Dissolved (0.2u) Aluminum (Al)	2025/10/23	104	80 - 120	100	80 - 120	ND,RDL=5	ug/L	0.59	20		
A037837	Total Kjeldahl Nitrogen (TKN)	2025/10/24	NC	80 - 120	106	80 - 120	ND, RDL=0.10	mg/L	5.6	20	118	80 - 120
A038237	Total Barium (Ba)	2025/10/23	97	80 - 120	99	80 - 120	ND, RDL=2.0	ug/L	2.0	20		
A038237	Total Boron (B)	2025/10/23	102	80 - 120	99	80 - 120	ND, RDL=10	ug/L	1.3	20		
A038237	Total Cadmium (Cd)	2025/10/23	101	80 - 120	102	80 - 120	ND, RDL=0.090	ug/L	NC	20		
A038237	Total Calcium (Ca)	2025/10/23	NC	80 - 120	102	80 - 120	ND, RDL=200	ug/L	0.41	20		
A038237	Total Cobalt (Co)	2025/10/23	102	80 - 120	102	80 - 120	ND, RDL=0.50	ug/L	4.2	20		
A038237	Total Copper (Cu)	2025/10/23	103	80 - 120	102	80 - 120	ND, RDL=0.90	ug/L	3.1	20		
A038237	Total Iron (Fe)	2025/10/23	100	80 - 120	100	80 - 120	ND, RDL=100	ug/L	2.6	20		
A038237	Total Lead (Pb)	2025/10/23	98	80 - 120	101	80 - 120	ND, RDL=0.50	ug/L	NC	20		
A038237	Total Magnesium (Mg)	2025/10/23	NC	80 - 120	100	80 - 120	ND, RDL=50	ug/L	0.17	20		
A038237	Total Manganese (Mn)	2025/10/23	102	80 - 120	101	80 - 120	ND, RDL=2.0	ug/L	0.52	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 Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A038237	Total Potassium (K)	2025/10/23	101	80 - 120	99	80 - 120	ND, RDL=200	ug/L	0.50	20		
A038237	Total Sodium (Na)	2025/10/23	NC	80 - 120	102	80 - 120	ND, RDL=100	ug/L	2.1	20		
A038237	Total Zinc (Zn)	2025/10/23	104	80 - 120	104	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.

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).

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 #: C5D1417
Report Date: 2025/10/27

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: Musclow Greenview
Sampler Initials: BM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Maharshi Prajapati, Bottle Preparation Technician

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.

C5D1417
2025/10/17 11:12

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

IMMEDIATE

NONT-2025-10-3972

Invoice To:		Report To:		PROJECT INFORMATION:	
Company:	#1192 BluMetric Environmental Inc	Company:	#5638 BluMetric Environmental Inc	Quotation #:	C45785
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:	250253-07
Tel:	(613) 839-3053 Fax: (613) 839-5376	Tel:	(613) 531-2725 Fax:	Project Name:	Musclow Greenview
Email:	ap@blumetric.ca	Email:	cbandler@blumetric.ca, cmiller@blumetric.ca, edms@bl	Site #:	
				Sampled By:	BM / NW

Bottle Order #: 1062823

COC #: C#1062823-01-01

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)? ___

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		~~MG-SW1~~									
2		~~MG-SW2~~									
3		~~MG-SW3~~									
4		MG-SW4A	25/10/16	9:45	SW	NO	✓	7	4.3		6.96
5		~~MG-SW5~~									
6		MG-SW7	25/10/16	10:35	SW	NO	✓	7	5.0		7.29
7		MG-QAQC-SW1	25/10/16	9:45	SW	NO	✓	7	4.3		6.96
8											
9											
10											

* Relinquished By (Print):	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Brad McCallum / Brad McCallum	2025/10/16	16:30		25/10/17	11:12	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	21.5 7.6	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

Bureau Veritas Canada (2019) Inc.

Your P.O. #: 250253-07
Your Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your C.O.C. #: 1041560-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/20
Report #: R8541134
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C551209
Received: 2025/05/07, 09:25

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
48-h Daphnia Magna Single Concentration (1)	1	N/A	N/A		
96-h Rainbow Trout Single Concentration (1)	1	N/A	N/A		

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 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) This test was performed by Nautilus Environmental - Guelph, 11 Nicholas Beaver Rd Unit B, Puslinch, ON, N0B 2C0

Your P.O. #: 250253-07
Your Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your C.O.C. #: 1041560-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/20
Report #: R8541134
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C551209
Received: 2025/05/07, 09:25

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 #: C551209
Report Date: 2025/05/20

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AQPO57
Sample ID: MG-SW3
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
48-h Daphnia Magna Single Concentration		9931869	N/A		Lims Auto Schedule Runner
96-h Rainbow Trout Single Concentration		9931870	N/A		Lims Auto Schedule Runner

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 #: C551209
Report Date: 2025/05/20

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	20.7°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 #: C551209
Report Date: 2025/05/20

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

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.

C551209
2025/05/07 09:25

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

C

NONT-2025-05-1007

Bottle Order #: 1041560

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#1192 BluMetric Environmental Inc	Company Name:	#5638 BluMetric Environmental Inc	Quotation #:	C45785
Attention:	Accounts Payable	Attention:	S'rana Scholes	P.O. #:	250253-07
Address:	1682 Woodward Drive Ottawa ON K2C 3R8	Address:	The Tower - The Woolen Mill 4 Cataraqui St Kingston ON K7K 1Z7	Project:	250253-07
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 #:	Musclow Greenview
				Sampled By:	BM / NW

COC #: C#1041560-01-01

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)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

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	Toxicity	# of Bottles	Comments
1		MG-SW3	25/05/05	14:50	SW	✓	1	
2								
3								
4								
5								
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
Brad M'Culloch / Brad M'Culloch	2025/05/06	08:00	[illegible]	25/05/07	09:25	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	8/22/20	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.

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

PRELIMINARY

ACUTE LETHALITY REPORT SUMMARY

Work Order : 257693

Deepthi Shaji
Bureau Veritas Laboratories
6740 Campobello Road
Mississauga ON
L5N 2L8

RESULTS

Substance	Date Collected	Date Tested	Species / Test	LC50	Mortality in 100% Concentration (%)
MG-SW3	2025-05-05	2025-05-08	Dm SC	-	3.3
	2025-05-05	2025-05-08	RBT SC	-	10

RBT = rainbow trout
Dm = *Daphnia magna*
* = pH Stabilized
SC = single concentration

Test Method(s)

Reference Method for Determining Acute Lethality of Effluents to Daphnia magna. Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments)

Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments)

Although test results are generated under strict QA/QC protocols, the results provided herein, along with any unsigned test reports, faxes, or emails are considered preliminary.

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 257693
Sample Number : 86730

SAMPLE IDENTIFICATION

Company :	Bureau Veritas Laboratories		
Location :	Mississauga ON	Sampling Date :	2025-05-05
Job Number :	C551209	Sampling Time :	14:50
Substance :	MG-SW3	Date Received :	2025-05-07
Sampling Method :	Grab	Time Received :	14:15
Sampled By :	N. Wilson	Temperature at Receipt :	22 °C
Sample Description :	Yellow, clear	Date Tested :	2025-05-08

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	3.3 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	8.6 days
Organism Batch :	Dm25-08	Average Brood Size :	33.1
Culture Mortality :	0.3% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms per Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms per Test Level :	30
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2025-05-06	LC50 :	6.4 g/L
Organism Batch :	Dm25-08	95% Confidence Limits :	6.1 - 6.8 g/L
Analyst(s) :	CYW	Historical Mean LC50 :	6.5 g/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	5.7 - 7.4 g/L

COMMENTS

- All test validity criteria as specified in the test method were satisfied.

Approved By : _____

Project Manager

Work Order : 257693
Sample Number : 86730

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.2	8.5	991	20	99	500 mg/L

0 HOURS

Date & Time : 2025-05-08 9:20
Analyst(s) : SSF/CYW (SSF)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.2	8.5	991	20	99	500
100	B	0	0	7.2	8.5	991	20	99	500
100	C	0	0	7.2	8.5	991	20	99	500
Control	A	0	0	8.1	8.6	463	20	99	150
Control	B	0	0	8.1	8.6	463	20	99	150
Control	C	0	0	8.1	8.6	463	20	99	150

Notes: Indigenous organisms were removed by pipette from the 100% concentration prior to test initiation.

24 HOURS

Date & Time : 2025-05-09 9:30
Analyst(s) : ACS (MK)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	1	–	–	–	20
100	B	–	0	–	–	–	20
100	C	–	0	–	–	–	20
Control	A	–	0	–	–	–	20
Control	B	–	0	–	–	–	20
Control	C	–	0	–	–	–	20

Notes:

48 HOURS

Date & Time : 2025-05-10 9:00
Analyst(s) : CYW (SF)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	1	0	8.1	8.4	920	20
100	B	0	0	8.1	8.3	928	20
100	C	0	0	8.1	8.4	928	20
Control	A	0	0	8.2	8.4	478	20
Control	B	0	0	8.2	8.4	476	20
Control	C	0	0	8.2	8.4	476	20

Notes:

Number immobile does not include number dead.

"–" = not measured/not required
* adjusted for temperature and barometric pressure

Test Data Reviewed By : JL
Date : 2025-05-13

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT
Rainbow Trout
EPS 1/RM/13

Work Order : 257693
Sample Number : 86730

SAMPLE IDENTIFICATION

Company :	Bureau Veritas Laboratories		
Location :	Mississauga ON	Sampling Date :	2025-05-05
Job Number :	C551209	Sampling Time :	14:50
Substance :	MG-SW3	Date Received :	2025-05-07
Sampling Method :	Grab	Time Received :	14:15
Sampled By :	N. Wilson	Temperature at Receipt :	22 °C
Sample Description :	Yellow, clear	Date Tested :	2025-05-08

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007, February 2016, and December 2023 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	10.0 %

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Mean Fork Length :	41.4 mm
Organism Batch :	T25-08	Range of Fork Lengths :	36 - 43 mm
Control Sample Size :	10	Mean Wet Weight :	0.6 g
Cumulative stock mortality rate :	0% (previous 7 days)	Organism Loading Rate :	0.3 g/L
Control organisms showing stress :	0 (at test completion)		

TEST CONDITIONS

Test Type :	Single concentration	Number of Replicates :	1
Sample pH Adjustment :	None	Organisms Per Replicate :	10
Sample Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Sample Pre-Aeration :	30 minutes	Volume of Sample :	18 L
Control Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Volume of Control :	18 L
Duration of Control Pre-aeration:	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T25-08	LC50 :	4561 mg/L
Date Tested :	2025-05-01	95% Confidence Limits :	4151 - 5011 mg/L
Analyst(s) :	GF, JGR, NM	Historical Mean LC50 :	4175 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	3244 - 5373 mg/L

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Approved By : _____
Project Manager

Work Order : 257693
Sample Number : 86730

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]
Initial Water Chemistry (100%) :	7.1	8.6	971	15	90
After 30 min pre-aeration :	7.3	9.1	977	15	95

0 HOURS

Date & Time 2025-05-08 8:45
Analyst(s) : GF (NWP)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]
100%	0	0	7.3	9.1	977	15	95
Control	0	0	8.1	9.7	689	15	99

Notes:

24 HOURS

Date & Time 2025-05-09 8:25
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	1	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

48 HOURS

Date & Time 2025-05-10 9:35
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	1	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

72 HOURS

Date & Time 2025-05-11 7:50
Analyst(s) : NWP

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	1	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2025-05-12 8:05
Analyst(s) : GF (NWP)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	1	0	8.0	9.4	983	15
Control	0	0	8.0	9.0	657	15

Notes:

"–" = not measured/not required
Number impaired does not include number dead.
[3] adjusted for temperature and barometric pressure

Test Data Reviewed By : EM
Date : 2025-05-15

Your P.O. #: 250253-07
Your Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your C.O.C. #: C#1041559-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/14
Report #: R8538549
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C551452
Received: 2025/05/07, 09:23

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	2	N/A	2025/05/12	CAM SOP-00447	EPA 6020B m
Dissolved Aluminum (0.2 u, clay free)	5	N/A	2025/05/14	CAM SOP-00447	EPA 6020B m
Alkalinity	1	N/A	2025/05/10	CAM SOP-00448	SM 24 2320 B m
Alkalinity	6	N/A	2025/05/09	CAM SOP-00448	SM 24 2320 B m
Biochemical Oxygen Demand (BOD)	7	2025/05/08	2025/05/13	CAM SOP-00427	SM 24 5210B m
Chloride by Automated Colourimetry	7	N/A	2025/05/12	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	7	N/A	2025/05/09	CAM SOP-00416	SM 24 5220 D m
Conductivity	1	N/A	2025/05/10	CAM SOP-00414	SM 24 2510 m
Conductivity	6	N/A	2025/05/09	CAM SOP-00414	SM 24 2510 m
Hardness (calculated as CaCO3)	7	N/A	2025/05/13	CAM SOP 00102/00408/00447	SM 2340 B
Total Metals Analysis by ICPMS	7	2025/05/09	2025/05/09	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	7	N/A	2025/05/09	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	6	N/A	2025/05/10	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Nitrate & Nitrite as Nitrogen in Water (1)	1	N/A	2025/05/11	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (2)	1	2025/05/09	2025/05/10	CAM SOP-00413	SM 24th - 4500H+ B
pH (2)	6	2025/05/09	2025/05/09	CAM SOP-00413	SM 24th - 4500H+ B
Phenols (4AAP)	7	N/A	2025/05/12	CAM SOP-00444	OMOE E3179 m
Field Measured pH (3)	7	N/A	2025/05/13		Field pH Meter
Sulphate by Automated Turbidimetry	7	N/A	2025/05/12	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	7	2025/05/10	2025/05/12	CAM SOP-00428	SM 24 2540C m
Field Temperature (3)	7	N/A	2025/05/13		Field Thermometer
Total Kjeldahl Nitrogen in Water	6	2025/05/08	2025/05/09	CAM SOP-00938	SM 4500-N B m
Total Kjeldahl Nitrogen in Water	1	2025/05/09	2025/05/12	CAM SOP-00938	SM 4500-N B m
Total Phosphorus (Colourimetric)	7	2025/05/08	2025/05/12	CAM SOP-00407	SM 24 4500-P I
Total Suspended Solids	7	2025/05/10	2025/05/12	CAM SOP-00428	SM 24 2540D m
Un-ionized Ammonia (4)	7	2025/05/07	2025/05/13	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

Your P.O. #: 250253-07
Your Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your C.O.C. #: C#1041559-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/14
Report #: R8538549
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C551452
Received: 2025/05/07, 09:23

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 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. #: 250253-07
Your Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your C.O.C. #: C#1041559-01-01

Attention: S'rana Scholes

BluMetric Environmental Inc
The Tower - The Woolen Mill
4 Cataraqui St
Kingston, ON
CANADA K7K 1Z7

Report Date: 2025/05/14
Report #: R8538549
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C551452
Received: 2025/05/07, 09:23

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 #: C551452
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQQB34	AQQB35			AQQB35		
Sampling Date		2025/05/05 13:15	2025/05/05 15:50			2025/05/05 15:50		
COC Number		C#1041559-01-01	C#1041559-01-01			C#1041559-01-01		
	UNITS	MG-SW1	MG-SW2	RDL	QC Batch	MG-SW2 Lab-Dup	RDL	QC Batch
Calculated Parameters								
Hardness (CaCO3)	mg/L	150	230	1.0	9923743			
Total Un-ionized Ammonia	mg/L	ND	0.0081	0.00061	9923719			
Field Measurements								
Field Temperature	Celsius	11.5	15.2	N/A	ONSITE			
Field Measured pH	pH	7.14	7.18		ONSITE			
Inorganics								
Total Ammonia-N	mg/L	0.057	1.6	0.050	9926002	1.6	0.050	9926002
Total BOD	mg/L	ND	ND	2	9924650			
Total Chemical Oxygen Demand (COD)	mg/L	23	4.1	4.0	9925290			
Conductivity	umho/cm	360	540	2.0	9925788			
Total Dissolved Solids	mg/L	250	345	10	9926394			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.44	2.2	0.10	9925338			
pH	pH	7.65	7.60		9925787			
Phenols-4AAP	mg/L	ND	ND	0.0010	9926802			
Total Phosphorus	mg/L	ND	0.045	0.020	9925373			
Total Suspended Solids	mg/L	ND	16	10	9926438			
Dissolved Sulphate (SO4)	mg/L	29	18	1.0	9926027			
Alkalinity (Total as CaCO3)	mg/L	120	200	1.0	9925779			
Dissolved Chloride (Cl-)	mg/L	19	34	1.0	9926024			
Nitrite (N)	mg/L	ND	ND	0.010	9925776			
Nitrate (N)	mg/L	ND	ND	0.10	9925776			
Nitrate + Nitrite (N)	mg/L	ND	ND	0.10	9925776			

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 #: C551452
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQQB36			AQQB36		
Sampling Date		2025/05/05 14:50			2025/05/05 14:50		
COC Number		C#1041559-01-01			C#1041559-01-01		
	UNITS	MG-SW3	RDL	QC Batch	MG-SW3 Lab-Dup	RDL	QC Batch
Calculated Parameters							
Hardness (CaCO3)	mg/L	490	1.0	9923743			
Total Un-ionized Ammonia	mg/L	0.0015	0.00061	9923719			
Field Measurements							
Field Temperature	Celsius	11.4	N/A	ONSITE			
Field Measured pH	pH	7.4		ONSITE			
Inorganics							
Total Ammonia-N	mg/L	0.23	0.050	9926002			
Total BOD	mg/L	ND	2	9924650			
Total Chemical Oxygen Demand (COD)	mg/L	43	4.0	9925290			
Conductivity	umho/cm	1100	2.0	9925788			
Total Dissolved Solids	mg/L	700	10	9926394			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.90	0.10	9925338			
pH	pH	7.84		9925787			
Phenols-4AAP	mg/L	ND	0.0010	9926802			
Total Phosphorus	mg/L	ND	0.020	9925373			
Total Suspended Solids	mg/L	ND	10	9926438			
Dissolved Sulphate (SO4)	mg/L	100	1.0	9926027	100	1.0	9926027
Alkalinity (Total as CaCO3)	mg/L	400	1.0	9925779			
Dissolved Chloride (Cl-)	mg/L	42	1.0	9926024	42	1.0	9926024
Nitrite (N)	mg/L	0.032	0.010	9925776			
Nitrate (N)	mg/L	2.28	0.10	9925776			
Nitrate + Nitrite (N)	mg/L	2.31	0.10	9925776			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
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 #: C551452
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQQB37		AQQB38		
Sampling Date		2025/05/05 11:15		2025/05/05 12:00		
COC Number		C#1041559-01-01		C#1041559-01-01		
	UNITS	MG-SW4A	QC Batch	MG-SW6	RDL	QC Batch
Calculated Parameters						
Hardness (CaCO3)	mg/L	39	9923743	93	1.0	9923743
Total Un-ionized Ammonia	mg/L	ND	9923719	ND	0.00061	9923719
Field Measurements						
Field Temperature	Celsius	11.4	ONSITE	12.1	N/A	ONSITE
Field Measured pH	pH	6.99	ONSITE	7.4		ONSITE
Inorganics						
Total Ammonia-N	mg/L	ND	9926002	ND	0.050	9926002
Total BOD	mg/L	ND	9924650	ND	2	9924650
Total Chemical Oxygen Demand (COD)	mg/L	14	9925290	15	4.0	9925290
Conductivity	umho/cm	92	9925788	220	2.0	9925788
Total Dissolved Solids	mg/L	90	9926394	155	10	9926394
Total Kjeldahl Nitrogen (TKN)	mg/L	0.27	9925338	0.29	0.10	9926214
pH	pH	7.46	9925787	7.71		9925787
Phenols-4AAP	mg/L	ND	9926802	ND	0.0010	9926802
Total Phosphorus	mg/L	ND	9925373	0.025	0.020	9925373
Total Suspended Solids	mg/L	ND	9926438	ND	10	9926438
Dissolved Sulphate (SO4)	mg/L	5.5	9926027	9.2	1.0	9926027
Alkalinity (Total as CaCO3)	mg/L	32	9925779	77	1.0	9925779
Dissolved Chloride (Cl-)	mg/L	4.4	9926024	13	1.0	9926024
Nitrite (N)	mg/L	ND	9925776	ND	0.010	9925776
Nitrate (N)	mg/L	ND	9925776	ND	0.10	9925776
Nitrate + Nitrite (N)	mg/L	ND	9925776	ND	0.10	9925776

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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 #: C551452
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQQB38			AQQB39	AQQB40		
Sampling Date		2025/05/05 12:00			2025/05/05 12:35	2025/05/05 11:15		
COC Number		C#1041559-01-01			C#1041559-01-01	C#1041559-01-01		
	UNITS	MG-SW6 Lab-Dup	RDL	QC Batch	MG-SW7	MG-QAQC-SW1	RDL	QC Batch
Calculated Parameters								
Hardness (CaCO3)	mg/L				28	39	1.0	9923743
Total Un-ionized Ammonia	mg/L				ND	ND	0.00061	9923719
Field Measurements								
Field Temperature	Celsius				9.2	11.4	N/A	ONSITE
Field Measured pH	pH				6.49	6.99		ONSITE
Inorganics								
Total Ammonia-N	mg/L				ND	ND	0.050	9926002
Total BOD	mg/L				ND	ND	2	9924650
Total Chemical Oxygen Demand (COD)	mg/L				10	15	4.0	9925290
Conductivity	umho/cm				67	91	2.0	9925788
Total Dissolved Solids	mg/L				65	100	10	9926394
Total Kjeldahl Nitrogen (TKN)	mg/L	0.29	0.10	9926214	0.21	0.24	0.10	9925338
pH	pH				6.98	7.43		9925787
Phenols-4AAP	mg/L				ND	ND	0.0010	9926802
Total Phosphorus	mg/L				ND	ND	0.020	9925373
Total Suspended Solids	mg/L				ND	ND	10	9926438
Dissolved Sulphate (SO4)	mg/L				8.3	5.4	1.0	9926027
Alkalinity (Total as CaCO3)	mg/L				21	32	1.0	9925779
Dissolved Chloride (Cl-)	mg/L				ND	4.1	1.0	9926024
Nitrite (N)	mg/L				ND	ND	0.010	9925776
Nitrate (N)	mg/L				ND	ND	0.10	9925776
Nitrate + Nitrite (N)	mg/L				ND	ND	0.10	9925776

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.

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQQB34	AQQB34		AQQB35		
Sampling Date		2025/05/05 13:15	2025/05/05 13:15		2025/05/05 15:50		
COC Number		C#1041559-01-01	C#1041559-01-01		C#1041559-01-01		
	UNITS	MG-SW1	MG-SW1 Lab-Dup	QC Batch	MG-SW2	RDL	QC Batch
Metals							
Dissolved (0.2u) Aluminum (Al)	ug/L	13	17	9928026	ND	5	9926235
Total Barium (Ba)	ug/L	32	31	9926005	69	2.0	9926005
Total Boron (B)	ug/L	ND	ND	9926005	200	10	9926005
Total Cadmium (Cd)	ug/L	ND	ND	9926005	ND	0.090	9926005
Total Calcium (Ca)	ug/L	51000	50000	9926005	83000	200	9926005
Total Cobalt (Co)	ug/L	ND	ND	9926005	ND	0.50	9926005
Total Copper (Cu)	ug/L	1.6	1.5	9926005	3.2	0.90	9926005
Total Iron (Fe)	ug/L	550	530	9926005	3500	100	9926005
Total Lead (Pb)	ug/L	ND	ND	9926005	ND	0.50	9926005
Total Magnesium (Mg)	ug/L	2000	1900	9926005	13000	50	9926005
Total Manganese (Mn)	ug/L	87	85	9926005	510	2.0	9926005
Total Potassium (K)	ug/L	1200	1200	9926005	10000	200	9926005
Total Sodium (Na)	ug/L	16000	16000	9926005	20000	100	9926005
Total Zinc (Zn)	ug/L	ND	ND	9926005	ND	5.0	9926005

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.

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQQB36	AQQB37		AQQB38		
Sampling Date		2025/05/05 14:50	2025/05/05 11:15		2025/05/05 12:00		
COC Number		C#1041559-01-01	C#1041559-01-01		C#1041559-01-01		
	UNITS	MG-SW3	MG-SW4A	QC Batch	MG-SW6	RDL	QC Batch
Metals							
Dissolved (0.2u) Aluminum (Al)	ug/L	7	33	9928026	ND	5	9926235
Total Barium (Ba)	ug/L	110	12	9926005	16	2.0	9925923
Total Boron (B)	ug/L	980	ND	9926005	31	10	9925923
Total Cadmium (Cd)	ug/L	ND	ND	9926005	ND	0.090	9925923
Total Calcium (Ca)	ug/L	150000	11000	9926005	29000	200	9925923
Total Cobalt (Co)	ug/L	ND	ND	9926005	ND	0.50	9925923
Total Copper (Cu)	ug/L	1.4	ND	9926005	ND	0.90	9925923
Total Iron (Fe)	ug/L	160	120	9926005	ND	100	9925923
Total Lead (Pb)	ug/L	ND	ND	9926005	ND	0.50	9925923
Total Magnesium (Mg)	ug/L	23000	1600	9926005	2900	50	9925923
Total Manganese (Mn)	ug/L	51	6.4	9926005	17	2.0	9925923
Total Potassium (K)	ug/L	12000	840	9926005	2000	200	9925923
Total Sodium (Na)	ug/L	42000	2800	9926005	8300	100	9925923
Total Zinc (Zn)	ug/L	ND	ND	9926005	ND	5.0	9925923

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AQQB39	AQQB40		
Sampling Date		2025/05/05 12:35	2025/05/05 11:15		
COC Number		C#1041559-01-01	C#1041559-01-01		
	UNITS	MG-SW7	MG-QAQC-SW1	RDL	QC Batch
Metals					
Dissolved (0.2u) Aluminum (Al)	ug/L	30	31	5	9928026
Total Barium (Ba)	ug/L	6.3	11	2.0	9926005
Total Boron (B)	ug/L	ND	14	10	9926005
Total Cadmium (Cd)	ug/L	ND	ND	0.090	9926005
Total Calcium (Ca)	ug/L	8300	11000	200	9926005
Total Cobalt (Co)	ug/L	ND	ND	0.50	9926005
Total Copper (Cu)	ug/L	ND	ND	0.90	9926005
Total Iron (Fe)	ug/L	110	120	100	9926005
Total Lead (Pb)	ug/L	ND	ND	0.50	9926005
Total Magnesium (Mg)	ug/L	1000	1600	50	9926005
Total Manganese (Mn)	ug/L	6.5	6.1	2.0	9926005
Total Potassium (K)	ug/L	360	830	200	9926005
Total Sodium (Na)	ug/L	1800	2700	100	9926005
Total Zinc (Zn)	ug/L	ND	ND	5.0	9926005

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 #: C551452
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AQQB34
Sample ID: MG-SW1
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9928026	N/A	2025/05/14	Thuy Linh Nguyen
Alkalinity	AT	9925779	N/A	2025/05/10	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924650	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9926024	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9925290	N/A	2025/05/09	Kruti Jitesh Patel
Conductivity	AT	9925788	N/A	2025/05/10	Nachiketa Gohil
Hardness (calculated as CaCO3)		9923743	N/A	2025/05/13	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9926005	2025/05/09	2025/05/09	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9926002	N/A	2025/05/09	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925776	N/A	2025/05/10	Helen He
pH	AT	9925787	2025/05/09	2025/05/10	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9926802	N/A	2025/05/12	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Sulphate by Automated Turbidimetry	SKAL	9926027	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926394	2025/05/10	2025/05/12	Tina Teng
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Total Kjeldahl Nitrogen in Water	SKAL	9925338	2025/05/08	2025/05/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9925373	2025/05/08	2025/05/12	Vidhi Khatri
Total Suspended Solids	BAL	9926438	2025/05/10	2025/05/12	Madhav Somani
Un-ionized Ammonia	CALC/NH3	9923719	2025/05/13	2025/05/13	Automated Statchk

Bureau Veritas ID: AQQB34 Dup
Sample ID: MG-SW1
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9928026	N/A	2025/05/14	Thuy Linh Nguyen
Total Metals Analysis by ICPMS	ICP/MS	9926005	2025/05/09	2025/05/09	Thuy Linh Nguyen

Bureau Veritas ID: AQQB35
Sample ID: MG-SW2
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9926235	N/A	2025/05/12	Thuy Linh Nguyen
Alkalinity	AT	9925779	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924650	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9926024	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9925290	N/A	2025/05/09	Kruti Jitesh Patel
Conductivity	AT	9925788	N/A	2025/05/09	Nachiketa Gohil
Hardness (calculated as CaCO3)		9923743	N/A	2025/05/13	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9926005	2025/05/09	2025/05/09	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9926002	N/A	2025/05/09	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 #: C551452
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AQQB35
Sample ID: MG-SW2
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate & Nitrite as Nitrogen in Water	LACH	9925776	N/A	2025/05/10	Helen He
pH	AT	9925787	2025/05/09	2025/05/09	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9926802	N/A	2025/05/12	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Sulphate by Automated Turbidimetry	SKAL	9926027	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926394	2025/05/10	2025/05/12	Tina Teng
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Total Kjeldahl Nitrogen in Water	SKAL	9925338	2025/05/08	2025/05/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9925373	2025/05/08	2025/05/12	Vidhi Khatri
Total Suspended Solids	BAL	9926438	2025/05/10	2025/05/12	Madhav Somani
Un-ionized Ammonia	CALC/NH3	9923719	2025/05/13	2025/05/13	Automated Statchk

Bureau Veritas ID: AQQB35 Dup
Sample ID: MG-SW2
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	SKAL/NH4	9926002	N/A	2025/05/09	Massarat Jan

Bureau Veritas ID: AQQB36
Sample ID: MG-SW3
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9928026	N/A	2025/05/14	Thuy Linh Nguyen
Alkalinity	AT	9925779	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924650	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9926024	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9925290	N/A	2025/05/09	Kruti Jitesh Patel
Conductivity	AT	9925788	N/A	2025/05/09	Nachiketa Gohil
Hardness (calculated as CaCO3)		9923743	N/A	2025/05/13	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9926005	2025/05/09	2025/05/09	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9926002	N/A	2025/05/09	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925776	N/A	2025/05/10	Helen He
pH	AT	9925787	2025/05/09	2025/05/09	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9926802	N/A	2025/05/12	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Sulphate by Automated Turbidimetry	SKAL	9926027	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926394	2025/05/10	2025/05/12	Tina Teng
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Total Kjeldahl Nitrogen in Water	SKAL	9925338	2025/05/08	2025/05/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9925373	2025/05/08	2025/05/12	Vidhi Khatri
Total Suspended Solids	BAL	9926438	2025/05/10	2025/05/12	Madhav Somani

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: AQQB36 **Collected:** 2025/05/05
Sample ID: MG-SW3 **Shipped:**
Matrix: Water **Received:** 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Un-ionized Ammonia	CALC/NH3	9923719	2025/05/13	2025/05/13	Automated Statchk

Bureau Veritas ID: AQQB36 Dup **Collected:** 2025/05/05
Sample ID: MG-SW3 **Shipped:**
Matrix: Water **Received:** 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	SKAL	9926024	N/A	2025/05/12	Massarat Jan
Sulphate by Automated Turbidimetry	SKAL	9926027	N/A	2025/05/12	Massarat Jan

Bureau Veritas ID: AQQB37 **Collected:** 2025/05/05
Sample ID: MG-SW4A **Shipped:**
Matrix: Water **Received:** 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9928026	N/A	2025/05/14	Thuy Linh Nguyen
Alkalinity	AT	9925779	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924650	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9926024	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9925290	N/A	2025/05/09	Kruti Jitesh Patel
Conductivity	AT	9925788	N/A	2025/05/09	Nachiketa Gohil
Hardness (calculated as CaCO3)		9923743	N/A	2025/05/13	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9926005	2025/05/09	2025/05/09	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9926002	N/A	2025/05/09	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925776	N/A	2025/05/10	Helen He
pH	AT	9925787	2025/05/09	2025/05/09	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9926802	N/A	2025/05/12	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Sulphate by Automated Turbidimetry	SKAL	9926027	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926394	2025/05/10	2025/05/12	Tina Teng
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Total Kjeldahl Nitrogen in Water	SKAL	9925338	2025/05/08	2025/05/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9925373	2025/05/08	2025/05/12	Vidhi Khatri
Total Suspended Solids	BAL	9926438	2025/05/10	2025/05/12	Madhav Somani
Un-ionized Ammonia	CALC/NH3	9923719	2025/05/13	2025/05/13	Automated Statchk

Bureau Veritas ID: AQQB38 **Collected:** 2025/05/05
Sample ID: MG-SW6 **Shipped:**
Matrix: Water **Received:** 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9926235	N/A	2025/05/12	Thuy Linh Nguyen
Alkalinity	AT	9925779	N/A	2025/05/09	Nachiketa Gohil

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 #: C551452
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AQQB38
Sample ID: MG-SW6
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Biochemical Oxygen Demand (BOD)	DO	9924650	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9926024	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9925290	N/A	2025/05/09	Kruti Jitesh Patel
Conductivity	AT	9925788	N/A	2025/05/09	Nachiketa Gohil
Hardness (calculated as CaCO3)		9923743	N/A	2025/05/13	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9925923	2025/05/09	2025/05/09	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9926002	N/A	2025/05/09	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925776	N/A	2025/05/10	Helen He
pH	AT	9925787	2025/05/09	2025/05/09	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9926802	N/A	2025/05/12	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Sulphate by Automated Turbidimetry	SKAL	9926027	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926394	2025/05/10	2025/05/12	Tina Teng
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Total Kjeldahl Nitrogen in Water	SKAL	9926214	2025/05/09	2025/05/12	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9925373	2025/05/08	2025/05/12	Vidhi Khatri
Total Suspended Solids	BAL	9926438	2025/05/10	2025/05/12	Madhav Somani
Un-ionized Ammonia	CALC/NH3	9923719	2025/05/13	2025/05/13	Automated Statchk

Bureau Veritas ID: AQQB38 Dup
Sample ID: MG-SW6
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	9926214	2025/05/09	2025/05/12	Rajni Tyagi

Bureau Veritas ID: AQQB39
Sample ID: MG-SW7
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9928026	N/A	2025/05/14	Thuy Linh Nguyen
Alkalinity	AT	9925779	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924650	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9926024	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9925290	N/A	2025/05/09	Kruti Jitesh Patel
Conductivity	AT	9925788	N/A	2025/05/09	Nachiketa Gohil
Hardness (calculated as CaCO3)		9923743	N/A	2025/05/13	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9926005	2025/05/09	2025/05/09	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9926002	N/A	2025/05/09	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925776	N/A	2025/05/10	Helen He
pH	AT	9925787	2025/05/09	2025/05/09	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9926802	N/A	2025/05/12	Sachi Patel

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 #: C551452
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AQQB39
Sample ID: MG-SW7
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Sulphate by Automated Turbidimetry	SKAL	9926027	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926394	2025/05/10	2025/05/12	Tina Teng
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Total Kjeldahl Nitrogen in Water	SKAL	9925338	2025/05/08	2025/05/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9925373	2025/05/08	2025/05/12	Vidhi Khatri
Total Suspended Solids	BAL	9926438	2025/05/10	2025/05/12	Madhav Somani
Un-ionized Ammonia	CALC/NH3	9923719	2025/05/13	2025/05/13	Automated Statchk

Bureau Veritas ID: AQQB40
Sample ID: MG-QAQC-SW1
Matrix: Water

Collected: 2025/05/05
Shipped:
Received: 2025/05/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9928026	N/A	2025/05/14	Thuy Linh Nguyen
Alkalinity	AT	9925779	N/A	2025/05/09	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9924650	2025/05/08	2025/05/13	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9926024	N/A	2025/05/12	Massarat Jan
Chemical Oxygen Demand	SPEC	9925290	N/A	2025/05/09	Kruti Jitesh Patel
Conductivity	AT	9925788	N/A	2025/05/09	Nachiketa Gohil
Hardness (calculated as CaCO3)		9923743	N/A	2025/05/13	Automated Statchk
Total Metals Analysis by ICPMS	ICP/MS	9926005	2025/05/09	2025/05/09	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9926002	N/A	2025/05/09	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9925776	N/A	2025/05/11	Helen He
pH	AT	9925787	2025/05/09	2025/05/09	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9926802	N/A	2025/05/12	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Sulphate by Automated Turbidimetry	SKAL	9926027	N/A	2025/05/12	Massarat Jan
Total Dissolved Solids	BAL	9926394	2025/05/10	2025/05/12	Tina Teng
Field Measured pH	PH	ONSITE	N/A	2025/05/13	Katherine Szozda
Total Kjeldahl Nitrogen in Water	SKAL	9925338	2025/05/08	2025/05/09	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9925373	2025/05/08	2025/05/12	Vidhi Khatri
Total Suspended Solids	BAL	9926438	2025/05/10	2025/05/12	Madhav Somani
Un-ionized Ammonia	CALC/NH3	9923719	2025/05/13	2025/05/13	Automated Statchk

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.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	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 Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9924650	Total BOD	2025/05/13					ND,RDL=2	mg/L	NC	30	101	80 - 120
9925290	Total Chemical Oxygen Demand (COD)	2025/05/09	101	80 - 120	102	80 - 120	ND, RDL=4.0	mg/L	10	20		
9925338	Total Kjeldahl Nitrogen (TKN)	2025/05/09	108	80 - 120	103	80 - 120	ND, RDL=0.10	mg/L	0	20	107	80 - 120
9925373	Total Phosphorus	2025/05/12	90	80 - 120	101	80 - 120	ND, RDL=0.020	mg/L	1.9	20	101	80 - 120
9925776	Nitrate (N)	2025/05/10	102	80 - 120	99	80 - 120	ND, RDL=0.10	mg/L	0.87	20		
9925776	Nitrite (N)	2025/05/10	103	80 - 120	100	80 - 120	ND, RDL=0.010	mg/L	NC	20		
9925779	Alkalinity (Total as CaCO3)	2025/05/09			95	85 - 115	ND, RDL=1.0	mg/L	4.1	20		
9925787	pH	2025/05/09			102	98 - 103			0.14	N/A		
9925788	Conductivity	2025/05/09			101	85 - 115	ND, RDL=2.0	umho/cm	0.34	10		
9925923	Total Barium (Ba)	2025/05/09	94	80 - 120	97	80 - 120	ND, RDL=2.0	ug/L	1.8	20		
9925923	Total Boron (B)	2025/05/09	93	80 - 120	96	80 - 120	ND, RDL=10	ug/L				
9925923	Total Cadmium (Cd)	2025/05/09	97	80 - 120	101	80 - 120	ND, RDL=0.090	ug/L				
9925923	Total Calcium (Ca)	2025/05/09	NC	80 - 120	99	80 - 120	ND, RDL=200	ug/L	0.14	20		
9925923	Total Cobalt (Co)	2025/05/09	93	80 - 120	94	80 - 120	ND, RDL=0.50	ug/L				
9925923	Total Copper (Cu)	2025/05/09	96	80 - 120	97	80 - 120	ND, RDL=0.90	ug/L				
9925923	Total Iron (Fe)	2025/05/09	94	80 - 120	97	80 - 120	ND, RDL=100	ug/L				
9925923	Total Lead (Pb)	2025/05/09	94	80 - 120	98	80 - 120	ND, RDL=0.50	ug/L				
9925923	Total Magnesium (Mg)	2025/05/09	91	80 - 120	95	80 - 120	ND, RDL=50	ug/L	1.1	20		
9925923	Total Manganese (Mn)	2025/05/09	94	80 - 120	96	80 - 120	ND, RDL=2.0	ug/L				
9925923	Total Potassium (K)	2025/05/09	94	80 - 120	95	80 - 120	ND, RDL=200	ug/L	0.89	20		
9925923	Total Sodium (Na)	2025/05/09	NC	80 - 120	96	80 - 120	ND, RDL=100	ug/L	0.18	20		
9925923	Total Zinc (Zn)	2025/05/09	99	80 - 120	102	80 - 120	ND, RDL=5.0	ug/L				
9926002	Total Ammonia-N	2025/05/09	99	75 - 125	102	80 - 120	ND, RDL=0.050	mg/L	0.16	20		
9926005	Total Barium (Ba)	2025/05/09	93	80 - 120	94	80 - 120	ND, RDL=2.0	ug/L	2.9	20		
9926005	Total Boron (B)	2025/05/09	97	80 - 120	105	80 - 120	ND, RDL=10	ug/L	NC	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
9926005	Total Cadmium (Cd)	2025/05/09	94	80 - 120	95	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9926005	Total Calcium (Ca)	2025/05/09	NC	80 - 120	96	80 - 120	ND, RDL=200	ug/L	2.0	20		
9926005	Total Cobalt (Co)	2025/05/09	99	80 - 120	97	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9926005	Total Copper (Cu)	2025/05/09	96	80 - 120	96	80 - 120	ND, RDL=0.90	ug/L	5.5	20		
9926005	Total Iron (Fe)	2025/05/09	96	80 - 120	93	80 - 120	ND, RDL=100	ug/L	2.4	20		
9926005	Total Lead (Pb)	2025/05/09	93	80 - 120	92	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9926005	Total Magnesium (Mg)	2025/05/09	96	80 - 120	96	80 - 120	ND, RDL=50	ug/L	2.1	20		
9926005	Total Manganese (Mn)	2025/05/09	95	80 - 120	93	80 - 120	ND, RDL=2.0	ug/L	1.3	20		
9926005	Total Potassium (K)	2025/05/09	95	80 - 120	93	80 - 120	ND, RDL=200	ug/L	3.3	20		
9926005	Total Sodium (Na)	2025/05/09	95	80 - 120	95	80 - 120	ND, RDL=100	ug/L	4.0	20		
9926005	Total Zinc (Zn)	2025/05/09	100	80 - 120	100	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9926024	Dissolved Chloride (Cl-)	2025/05/12	NC	80 - 120	100	80 - 120	ND, RDL=1.0	mg/L	0.73	20		
9926027	Dissolved Sulphate (SO4)	2025/05/12	NC	75 - 125	94	80 - 120	ND, RDL=1.0	mg/L	0.41	20		
9926214	Total Kjeldahl Nitrogen (TKN)	2025/05/12	102	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	0	20	105	80 - 120
9926235	Dissolved (0.2u) Aluminum (Al)	2025/05/12	95	80 - 120	95	80 - 120	5,RDL=5	ug/L				
9926394	Total Dissolved Solids	2025/05/12			102	80 - 120	ND, RDL=10	mg/L	9.1	20		
9926438	Total Suspended Solids	2025/05/12			98	80 - 120	ND, RDL=10	mg/L	NC	20		
9926802	Phenols-4AAP	2025/05/12	96	80 - 120	104	80 - 120	ND, RDL=0.0010	mg/L	NC	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
9928026	Dissolved (0.2u) Aluminum (Al)	2025/05/14	99	80 - 120	99	80 - 120	ND,RDL=5	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.

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).

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 #: C551452
Report Date: 2025/05/14

BluMetric Environmental Inc
Client Project #: 250253-07
Site Location: MUSCLOW GREENVIEW
Your P.O. #: 250253-07
Sampler Initials: BM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Katherine Szozda, 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.

C551452
2025/05/07 09:23

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-2025-05-1218

Bottle Order #: 1041559

C#1041559-01-01

Project Manager: Deepthi Shaji

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#1192 BluMetric Environmental Inc	Company Name:	#5638 BluMetric Environmental Inc	Quotation #:	C45785
Attention:	Accounts Payable	Attention:	S'rana Scholes	P.O. #:	250253-07
Address:	1682 Woodward Drive Ottawa ON K2C 3R8	Address:	The Tower - The Woolen Mill 4 Cataraqui St Kingston ON K7K 1Z7	Project:	250253-07
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 #:	Musclow Greenview
				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)
☐ 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: [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	Surface Water - PWQO	# of Bottles	Temp °C	Comments	pH
1		MG-SW1	25/05/05	13:15	SW	NO	✓	7	11.5		7.14
2		MG-SW2	25/05/05	15:50	SW	NO	✓	7	15.2		7.18
3		MG-SW3	25/05/05	14:50	SW	NO	✓	7	11.4		7.4
4		MG-SW4A	25/05/05	11:15	SW	NO	✓	7	11.4		6.99
5		MG-SW6	25/05/05	12:00	SW	NO	✓	7	12.1		7.4
6		MG-SW7	25/05/05	12:35	SW	NO	✓	7	9.2		6.49
7		MG-QAQC-SW1	25/05/05	11:15	SW	NO	✓	7	11.4		6.99
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
Brad Mackellar Brad MacKellar	2025/05/06	08:00	Bhavjotkaur BHAVJOT KAUR	2025/05/07	09:23	

Laboratory Use Only Ice Y

Time Sensitive | Temperature (°C) on Recei 6/6/6 | Custody Seal Present Yes ✓ | Intact No

* 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 Results

2025 Groundwater Sampling Quality Assurance and Quality Control (Fall)

Sample Description		RDL	MG-18-1	MG-QAQC-GW1	Relative Percent Difference
Date Sampled			16-Oct-25	16-Oct-25	
Parameter	Unit				
Chloride	mg/L	1	56	54	4%
Nitrate as N	mg/L	0.1	<0.1	<0.1	NA
Sulphate	mg/L	0.1	16	16	0%
Calcium (diss)	mg/L	0.05	60	61	2%
Magnesium (diss)	mg/L	0.05	15	15	0%
Sodium (diss)	mg/L	0.05	24	24	0%
Alkalinity (as CaCO3)	mg/L	1	170	160	6%
Ammonia as N	mg/L	0.02	0.2	0.14	NA
Biochemical Oxygen Demand	mg/L	2	<2	<2	NA
Chemical Oxygen Demand	mg/L	4	<4	<4	NA
Dissolved Organic Carbon	mg/L	0.4	4.1	4	2%
Electrical Conductivity	uS/cm	1	560	560	0%
pH	pH units		7.37	7.57	3%
Total Dissolved Solids	mg/L	10	205	340	50%
Total Suspended Solids	mg/L	10	2900	6000	70%
Aluminum (diss)	mg/L	0.0049	<0.0049	<0.0049	NA
Barium (diss)	mg/L	0.002	0.068	0.069	1%
Boron (diss)	mg/L	0.01	0.15	0.15	0%
Cadmium (diss)	mg/L	0.00009	0.000095	0.00011	NA
Chromium (diss)	mg/L	0.005	<0.005	<0.005	NA
Cobalt (diss)	mg/L	0.0005	0.021	0.022	5%
Iron (diss)	mg/L	0.1	0.35	0.35	NA
Lead (diss)	mg/L	0.0005	<0.0005	<0.0005	NA
Manganese (diss)	mg/L	0.002	4.1	4.2	2%
Silver (diss)	mg/L	0.00009	<0.00009	<0.00009	NA
Zinc (diss)	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 (Spring)

Sample Description		RDL	MG-18-1	MG-QAQC-GW1	Relative Percent Difference
Date Sampled			5-May-25	5-May-25	
Parameter	**Unit**				
Chloride	mg/L	0.1	92	91	1%
Nitrate as N	mg/L	0.05	<0.1	<0.1	NA
Sulphate	mg/L	0.1	13	13	0%
Calcium (diss)	mg/L	0.05	85	86	1%
Magnesium (diss)	mg/L	0.05	20	20	0%
Sodium (diss)	mg/L	0.05	25	25	0%
Alkalinity (as CaCO3)	mg/L	1	220	220	0%
Ammonia as N	mg/L	0.02	0.14	0.14	NA
Biochemical Oxygen Demand	mg/L	2	<2	<2	NA
Chemical Oxygen Demand	mg/L	4	9.2	11	NA
Dissolved Organic Carbon	mg/L	0.4	5.8	5.7	2%
Electrical Conductivity	uS/cm	1	760	770	1%
pH	pH units		7.35	7.48	2%
Total Dissolved Solids	mg/L	10	500	535	7%
Total Suspended Solids	mg/L	10	8600	8000	7%
Aluminum (diss)	mg/L	0.004	<0.0049	<0.0049	NA
Barium (diss)	mg/L	0.002	0.093	0.09	3%
Boron (diss)	mg/L	0.01	0.13	0.13	0%
Cadmium (diss)	mg/L	0.0001	<0.00009	<0.00009	NA
Chromium (diss)	mg/L	0.002	<0.005	<0.005	NA
Cobalt (diss)	mg/L	0.0005	0.033	0.033	0%
Iron (diss)	mg/L	0.01	0.67	0.67	0%
Lead (diss)	mg/L	0.0005	<0.0005	<0.0005	NA
Manganese (diss)	mg/L	0.002	5.8	5.8	0%
Silver (diss)	mg/L	0.0001	<0.00009	<0.00009	NA
Zinc (diss)	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 (Spring)

Sample Description		RDL	MG-18-1	MG-QAQC-GW1	Relative Percent Difference
Date Sampled			5-May-25	5-May-25	
Parameter	**Unit**				
Chloride	mg/L	0.1	92	91	1%
Nitrate as N	mg/L	0.05	<0.1	<0.1	NA
Sulphate	mg/L	0.1	13	13	0%
Calcium (diss)	mg/L	0.05	85	86	1%
Magnesium (diss)	mg/L	0.05	20	20	0%
Sodium (diss)	mg/L	0.05	25	25	0%
Alkalinity (as CaCO3)	mg/L	1	220	220	0%
Ammonia as N	mg/L	0.02	0.14	0.14	NA
Biochemical Oxygen Demand	mg/L	2	<2	<2	NA
Chemical Oxygen Demand	mg/L	4	9.2	11	NA
Dissolved Organic Carbon	mg/L	0.4	5.8	5.7	2%
Electrical Conductivity	uS/cm	1	760	770	1%
pH	pH units		7.35	7.48	2%
Total Dissolved Solids	mg/L	10	500	535	7%
Total Suspended Solids	mg/L	10	8600	8000	7%
Aluminum (diss)	mg/L	0.004	<0.0049	<0.0049	NA
Barium (diss)	mg/L	0.002	0.093	0.09	3%
Boron (diss)	mg/L	0.01	0.13	0.13	0%
Cadmium (diss)	mg/L	0.0001	<0.00009	<0.00009	NA
Chromium (diss)	mg/L	0.002	<0.005	<0.005	NA
Cobalt (diss)	mg/L	0.0005	0.033	0.033	0%
Iron (diss)	mg/L	0.01	0.67	0.67	0%
Lead (diss)	mg/L	0.0005	<0.0005	<0.0005	NA
Manganese (diss)	mg/L	0.002	5.8	5.8	0%
Silver (diss)	mg/L	0.0001	<0.00009	<0.00009	NA
Zinc (diss)	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 Surface Water Sampling Quality Assurance and Quality Control (Fall)

Sample Description		RDL	MG-SW4A	MG-QAQC-SW1	Relative Percent Difference
Date Sampled			16-Oct-25	16-Oct-25	
Anions					
Chloride	mg/L	1	9.3	8.8	6%
Nitrate + Nitrite	mg/L	0.1	<0.1	<0.1	NC
Nitrate as N	mg/L	0.1	<0.1	<0.1	NC
Nitrite as N	mg/L	0.01	<0.01	<0.01	NC
Sulphate	mg/L	1	2.4	2.4	NC
Cations					
Calcium (tot)	mg/L	0.2	21	21	0%
Magnesium (tot)	mg/L	0.05	3.4	3.5	3%
Potassium (tot)	mg/L	0.2	2.1	2.2	5%
Sodium (tot)	mg/L	0.1	4.3	4.4	2%
Field Parameters					
Temperature	deg. C		4.3	4.3	0%
pH (Field)	pH units		6.96	6.96	0%
General Chemistry					
Alkalinity (as CaCO3)	mg/L	1	56	56	0%
Ammonia as N	mg/L	0.05	0.052	0.054	NC
Biochemical Oxygen Demand	mg/L	2	2	2	NC
Chemical Oxygen Demand	mg/L	4	21	20	5%
Electrical Conductivity	uS/cm	2	150	150	0%
Hardness (as CaCO3)	mg/L	1	62	61	2%
Phenols	mg/L	0.001	0.0012	0.001	NC
Total Dissolved Solids	mg/L	10	100	90	11%
Total Kjeldahl Nitrogen	mg/L	0.1	0.48	0.42	NC
Total Phosphorus	mg/L	0.02	0.063	0.05	NC
Total Suspended Solids	mg/L	10	22	<10	NC
Unionized Ammonia (Calc)	mg/L	0.00061	<0.00061	<0.00061	NC
pH	pH units		7.31	7.27	1%
Metals					
Aluminum (diss, 0.2 µm)	mg/L	0.005	0.031	0.03	3%
Barium (tot)	mg/L	0.002	0.023	0.022	4%
Boron (tot)	mg/L	0.01	<0.01	<0.01	NC
Cadmium (tot)	mg/L	0.00009	<0.00009	<0.00009	NC
Cobalt (tot)	mg/L	0.0005	0.00093	0.0011	NC
Copper (tot)	mg/L	0.0009	<0.0009	<0.0009	NC
Iron (tot)	mg/L	0.1	3.4	2.9	16%
Lead (tot)	mg/L	0.0005	<0.0005	<0.0005	NC
Manganese (tot)	mg/L	0.002	0.46	0.45	2%
Zinc (tot)	mg/L	0.005	<0.005	<0.005	NC

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		RDL	MG-SW4A	MG-QAQC-SW1	Relative Percent Difference
Date Sampled			5-May-25	5-May-25	
Anions					
Chloride	mg/L	1	4.4	4.1	NA
Nitrate + Nitrite	mg/L	0.1	<0.1	<0.1	NA
Nitrate as N	mg/L	0.1	<0.1	<0.1	NA
Nitrite as N	mg/L	0.01	<0.01	<0.01	NA
Sulphate	mg/L	1	5.5	5.4	2%
Cations					
Calcium (tot)	mg/L	0.2	11	11	0%
Magnesium (tot)	mg/L	0.05	1.6	1.6	0%
Potassium (tot)	mg/L	0.2	0.84	0.83	NA
Sodium (tot)	mg/L	0.1	2.8	2.7	4%
Field Parameters					
Temperature	deg. C		11.4	11.4	0%
pH (Field)	pH units		6.99	6.99	0%
General Chemistry					
Alkalinity (as CaCO3)	mg/L	1	32	32	0%
Ammonia as N	mg/L	0.05	<0.05	<0.05	NA
Biochemical Oxygen Demand	mg/L	2	<2	<2	NA
Chemical Oxygen Demand	mg/L	4	14	15	NA
Electrical Conductivity	uS/cm	2	92	91	1%
Hardness (as CaCO3)	mg/L	1	39	39	0%
Phenols	mg/L	0.001	<0.001	<0.001	NA
Total Dissolved Solids	mg/L	10	90	100	11%
Total Kjeldahl Nitrogen	mg/L	0.1	0.27	0.24	NA
Total Phosphorus	mg/L	0.02	<0.02	<0.02	NA
Total Suspended Solids	mg/L	10	<10	<10	NA
Unionized Ammonia (Calc)	mg/L	0.00061	<0.00061	<0.00061	NA
pH	pH units		7.46	7.43	0%
Metals					
Aluminum (diss, 0.2 µm)	mg/L	0.005	0.033	0.031	6%
Barium (tot)	mg/L	0.002	0.012	0.011	9%
Boron (tot)	mg/L	0.01	<0.01	0.014	NA
Cadmium (tot)	mg/L	0.00009	<0.00009	<0.00009	NA
Cobalt (tot)	mg/L	0.0005	<0.0005	<0.0005	NA
Copper (tot)	mg/L	0.0009	<0.0009	<0.0009	NA
Iron (tot)	mg/L	0.1	0.12	0.12	NA
Lead (tot)	mg/L	0.0005	<0.0005	<0.0005	NA
Manganese (tot)	mg/L	0.002	0.0064	0.0061	NA
Zinc (tot)	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.

Appendix E

Historical Chemistry Data

Appendix E

E-1 Historical Groundwater Data

Hastings Highlands Historical Groundwater Analytical Chemistry Results							Location	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1	MG-18-1
							Sample ID	MG-18-1	MG-18-1	MG-18-1-QAQC-S19 (MG-18-1)	MG-18-1	MG-18-1	MG-18-1-QAQC-S20 (MG-18-1)	MG-18-1	MG-18-1	MG-QAQC GW-S21 (MG-18-1)	MG-18-1	MG-QAQC GW-F21 (MG-18-1)	MG-18-1	MG-QAQC GW-S22 (MG-18-1)	MG-18-1	MG-18-1	MG-QAQC-GW1 (MG-18-1)	MG-18-1	MG-18-1	MG-QAQC-GW1 (MG-18-1)	MG-18-1	MG-QAQC-GW1 (MG-18-1)
Parameter	Units	Max Concentration	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	RUV-MG	Sample Date	2019-Jan-10	2019-May-06	2019-May-06	2019-Oct-21	2020-May-05	2020-May-05	2020-Oct-08	2021-Apr-19	2021-Apr-19	2021-Oct-20	2021-Oct-20	2022-May-04	2022-May-04	2022-Oct-25	2023-May-02	2023-May-02	2023-Oct-18	2024-May-01	2024-Oct-30	2024-Oct-30	2025-May-05	2025-May-05
							Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions							Detection Limit																					
Chloride	mg/L	160	250	-	-	125.25	0.1	37.3	44.8	45	57.2	70.5	70.4	69.3	101	107	72.3	72.8	88.3	91	72.9	145	134	87	110	74	82	92	91
Nitrate + Nitrite	mg/L	<0.5	-	-	-		0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	-	-
Nitrate as N	mg/L	3.18	10	-	-	2.5375	0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.25	<0.1	<0.25	<0.25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/L	<0.05	1	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01	-	-
Sulphate	mg/L	119	500	-	-	253.575	0.1	8.55	11.1	11.2	13.1	23.3	22.9	20	16.3	16.4	20.5	20.4	17.6	15.5	18	11.4	12.6	20	14	19	19	13	13
Cations																													
Calcium (diss)	mg/L	330	-	-	-	-	0.05	71.5	85.5	85.5	91.6	121	123	78.5	104	102	86.1	86.5	97.4	107	62.8	116	121	92	120	89	94	85	86
Magnesium (diss)	mg/L	61.2	-	-	-	-	0.05	13.6	17.1	17.1	19.5	24	24.7	14.8	22.1	21.6	17.6	17.8	21.2	23	15.6	27.1	26	20	26	21	23	20	20
Potassium (diss)	mg/L	5.88	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium (diss)	mg/L	91.5	200	-	-	101.5	0.05	14	12.5	12.5	26.7	20	20.3	15.5	18.3	17.9	17.1	17.3	19.7	21.4	17.8	21.7	21.1	26	29	27	29	25	25
General Chemistry																													
Alkalinity (as CaCO3)	mg/L	1210	30 - 500	See Factsheet	-	47.75 - 282.75	1	231	305	310	310	381	384	216	248	250	233	252	290	290	181	284	286	220	260	250	250	220	220
Ammonia as N	mg/L	6.48	-	-	-	-	0.02	0.08	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.073	0.11	0.086	0.099	0.14	0.14
Biochemical Oxygen Demand	mg/L	40	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<2	<2	<2	<2	<2	3	4	<2	<2	<2	2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	177	-	-	-	-	4	7	11	10	<5	25	18	20	<5	9	8	7	18	23	<5	11	23	16	17	<4	4.5	9.2	11
Dissolved Organic Carbon	mg/L	185	5	-	-	3.475	0.4	4.9	4	8.3	4.8	10.9	11.1	4.5	6	5.6	5.6	5.8	8.9	8.6	3.7	8.9	8.8	5	7.9	6.6	7.4	5.8	5.7
Electrical Conductivity	uS/cm	2520	-	-	-	-	1	505	645	642	726	1170	1160	613	862	866	718	720	841	845	591	949	958	760	890	770	770	760	770
Hardness (as CaCO3)	mg/L	1073.5	80 - 100	-	-	-		234.5	283.9	283.9	309	401	408.8	257	350.7	343.6	287.5	289.3	330.5	361.9	221.1	-	-	-	-	-	-	-	-
Lab Filtration DOC	unitless		-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	8.23	6.5 - 8.5	6.5 - 8.5	-	6.9275 - 7.9275		8.02	7.61	7.55	7.64	6.94	6.98	7.42	6.94	6.95	7.23	7.3	6.91	6.98	7.39	6.93	6.99	7.55	7.2	7.19	7.84	7.35	7.48
Total Dissolved Solids	mg/L	1300	500	-	-	390	5	290	344	344	456	570	574	394	642	628	474	468	524	590	346	558	556	590	660	535	535	500	535
Total Suspended Solids	mg/L	68700	-	-	-	-	10	68700	23500	33500	26500	5370	8860	15500	9410	10200	284	8890	7440	6370	8980	4940	5760	13000	3400	4600	5600	8600	8000
Unionized Ammonia (Calc)	mg/L	0.0632438	-	-	-	-	0.1	-	0.0000092	0.0000092	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																													
Aluminum (diss, 0.45 µm)	mg/L	2.33	0.1	-	Calculated	0.051225	0.004	0.006	<0.004	0.006	2.33	0.017	0.006	0.009	0.011	0.012	0.008	<0.004	0.009	0.013	0.021	0.004	<0.004	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
Barium (diss)	mg/L	0.309	1			0.262	0.002	0.07	0.08	0.076	0.143	0.107	0.105	0.061	0.089	0.09	0.08	0.078	0.108	0.106	0.067	0.108	0.103	0.087	0.12	0.1	0.099	0.093	0.09
Beryllium (diss)	mg/L	<0.001	-	Calculated	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (diss)	mg/L	1.33	5	-	0.2	1.25563	0.01	0.093	0.082	0.079	0.147	0.172	0.186	0.136	0.133	0.141	0.142	0.14	0.165	0.173	0.132	0.148	0.14	0.19	0.16	0.17	0.18	0.13	0.13
Cadmium (diss)	mg/L	<0.002	0.005	-	Calculated	0.0012837	0.00009	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00011	0.0001	0.00012	0.00009	<0.00009	<0.00009
Chromium (diss)	mg/L	0.008	0.05	-	-	0.014375	0.002	<0.003	<0.003	<0.003	0.006	<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	<0.005
Cobalt (diss)	mg/L	0.1	-	-	0.0009	-	0.0005	0.011	0.0125	0.0121	0.031	0.0313	0.0312	0.0204	0.0291	0.0256	0.0275	0.0266	0.0358	0.0356	0.0208	0.0354	0.0348	0.025	0.042	0.03	0.032	0.033	0.033
Copper (diss)	mg/L	<0.003	1	-	Calculated	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (diss)	mg/L	200	0.3	0.3	-	0.175	0.01	<0.01	<0.01	<0.01	3.11	0.099	0.092	<0.01	0.095	0.064	0.28	0.311	0.458	0.441	0.182	0.354	0.357	0.36	0.72	0.53	0.57	0.67	0.67
Lead (diss)	mg/L	0.002	0.01	-	Calculated	0.0026875	0.0005	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00082	<0.0005	<0.0005
Manganese (diss)	mg/L	13	0.05	-	-	0.04075	0.002	1.25	2.6	2.51	5.53	6.94	6.92	4.47	6.62	6.77	6.08	5.82	7.26	7.08	4.19	7.46	7.33	5.2	7.6	6.1	6.5	5.8	5.8
Molybdenum (diss)	mg/L	0.003	-	-	0.04	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (diss)	mg/L	0.006	-	0.025	-	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	15.4	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (diss)	mg/L	<0.002	-	0.0001	-	-	0.00009	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Strontium (diss)	mg/L	2.07	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (diss)	mg/L	<0.006	-	-	0.0003	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (diss)	mg/L	0.003	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	<0.002	-	-	0.006	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (diss)	mg/L	325	5	-	0.02	2.50125	0.005	<0.005	<0.005	<0.005	0.017	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	0.137	0.006	0.006	<0.005	<0.005	0.026	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs																													
1,1,1,2-Tetrachloroethane	mg/L	<0.0005	-	-	0.02	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.0005	-	-	-	-
1,1,1-Trichloroethane	mg/L	<0.0003	-	-	0.01	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0003	-	-	-	<0.0002	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	<0.0004	-	-	0.07	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.0004	-	-	-	-
1,1,2-Trichloroethane	mg/L	<0.0004	-	-	0.8	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0004	-	-	-	-
1,1-Dichloroethane	mg/L	0.00096	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0003	-	-	-	<0.0002	-	-	-	-
1,1-Dichloroethylene	mg/L	<0.0002	0.014	-	0.04	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0002	-	-	-	-
1,2,4-Trichlorobenzene	mg/L	<0.0003	-	0.0005	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	<0.0004	0.003	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.0004	-	-	-	-
1,2-Dichloroethane	mg/L	0.0011	0.005	-	0.1	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.00049	-	-	-	-
1,2-Dichloropropane	mg/L	<0.0002	-	-	0.0007	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0002	-	-	-	-
1,3-Dichlorobenzene	mg/L	<0.0004	-	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.0004	-	-	-	-
1,3-Dichloropropene (Cis + Trans	mg/L	<0.0003	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0003	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	<0.0004	0.001	0.004	-	-	0.0001	-	-	-	<0.0001	-	-	<0.0001	-	-	<0.0002	-	<0.0001	-	<0.0001	-	-	-	<0.0004	-	-	-	-
2-Hexanone	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-
Acetone	mg/L	<0.01	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	<0.01	-	-	-	-
Benzene	mg/L	0.00515	0.001	-	0.1	-	0.0002	-	-	-	0.00036	-	-	<0.0002	-	-	0.0004	-	<0.0002	-	<0.0002	-	-	-	0.00022	-	-	-	-
Bromodichloromethane	mg/L	<0.0005	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0005	-	-	-	-
Bromoform	mg/L	<0.001	-	-	0.06	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.001	-	-	-	-
Bromomethane	mg/L	<0.0005	-	-	0.0009	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0005	-	-	-	-
Carbon Tetrachloride	mg/L	<0.0002	0.002	-	-	-	0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.00019	-	-	-	-
Chlorobenzene	mg/L	<0.0002	-	0.015	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.0002	-	-	-	-
Chloroethane	mg/L	0.014	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-
Chloroform	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0002	-	-	-	-
Chloromethane	mg/L	<0.0002	-	-	0.7	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	0.02	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	-	-	<0.0005	-	-	-	-
cis-1,3-Dichloropropene	mg/L	<0.0003	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0003	-	-	-	-
Dibromochloromethane	mg/L	<0.0005	-	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.0005	-	-	-	-
Dichlorodifluoromethane	mg/L	<0.001	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0004	-	-	-	<0.001	-	-	-	-
Dichloromethane	mg/L	<0.002	0.05	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	<0.0003	-	-	-	-	-	<0.002	-	-	-	-
Ethylbenzene	mg/L	<0.0002	0.0016	-	0.008	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.0002	-	-	-	-
Ethylene Dibromide	mg/L	<0.00019	-	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.00019	-	-	-	-
Hexane	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-
m & p-Xylene	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	<0.0012	-	-	0.1	-	0.0003	-	-	-	<0.0003	-	-	<0.0003	-	-	<0.0006	-	-	-	<0.0003	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	<0.01	-	-	0.4	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	<0.01	-	-	-	-
Methyl Isobutyl Ketone	mg/L	<0.005	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	<0.005	-	-	-	-
Methyl tertiary-butyl ether (MTB	mg/L	<0.0005	0.015	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0005	-	-	-	-
n-Hexane	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-
o-Xylene	mg/L	<0.0002	-	-	0.04	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.0002	-	-	-	-
Styrene	mg/L	<0.0004	-	-	0.004	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	-	<0.0004	-	-	-	-
Tetrachloroethylene	mg/L	<0.0002	0.01	-	0.05	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0002	-	-	-	-
Toluene	mg/L	<0.0008	0.024	-	0.0008	-	0.0002	-	-	-	<0.0002	-	-	<0.0002	-	-	<0.0004	-	<0.0002	-	<0.0002	-	-	-	<0.0002	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	<0.0005	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0005	-	-	-	-
trans-1,3-Dichloropropene	mg/L	<0.0004	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0003	-	-	-	<0.0004	-	-	-	-
Trichloroethylene	mg/L	<0.0002	0.005	-	0.02	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	<0.0002	-	-	-	-
Trichlorofluoromethane	mg/L	<0.0005	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0004	-	-	-	<0.0005	-	-	-	-
Vinyl Chloride	mg/L	0.00299	0.001	-	0.6	-	0.00017	-	-	-	<0.00017	-	-	<0.00017	-	-	<0.00034	-	<0.00017	-	<0.00017	-	-	-	<0.0002	-	-	-	-
Xylene Mixture	mg/L	<0.0002	0.02	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-
Xylenes, m+p	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-
Xylenes, total	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
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
Concentration exceeds RUV-MG	Reasonable Use Values Musclow Greenview

Hastings Highlands Historical Groundwater Analytical Chemistry Results							Location	MG-18-1	MG-18-1 MG-QAQC-GW1 (MG-18-1)	MG-18-2	MG-18-2	MG-18-2	MG-18-2 MG-18-2-QAQC-F19 (MG-18-2)	MG-18-2	MG-18-2	MG-18-2 MG-18-2-QAQC-F20 (MG-18-2)	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-3	MG-18-3	MG-18-3R	MG-18-3R MG-QAQC-GW1 (MG-18-3R)	MG-18-3R	MG-18-3R MG-QAQC-GW1 (MG-18-3R)	MG-18-3R	MG-18-3R
							Sample ID	MG-18-1	MG-18-1	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-2	MG-18-3	MG-18-3	MG-18-3R	MG-18-3R	MG-18-3R	MG-18-3R	MG-18-3R	MG-18-3R	MG-18-3R
Parameter	Units	Max Concentration	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	RUV-MG	Sample Date	2025-Oct-16	2025-Oct-16	2019-Jan-10	2019-May-06	2019-Oct-21	2019-Oct-21	2020-May-05	2020-Oct-08	2020-Oct-08	2021-Apr-19	2021-Oct-20	2022-May-04	2022-Oct-25	2023-May-02	2023-Oct-18	2024-May-01	2019-May-06	2023-May-02	2023-Oct-18	2023-Oct-18	2024-May-01	2024-May-01	2024-Oct-30	2025-May-05
							Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions							Detection Limit																								
Chloride	mg/L	160	250	-	-	125.25	0.1	56	54	160	111	108	105	111	93.1	90.2	94.1	93.8	96.2	102	117	97	130	5.19	1.36	<1	<1	<1	<1	<1	2
Nitrate + Nitrite	mg/L	<0.5	-	-	-		0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
Nitrate as N	mg/L	3.18	10	-	-	2.5375	0.05	<0.1	<0.1	<0.5	<0.25	<0.25	<0.25	<1	<0.5	<0.5	<0.5	<0.07	<0.07	<0.07	<0.05	<0.1	<0.1	<0.05	3.18	<0.1	<0.1	0.12	0.13	<0.1	<0.1
Nitrite as N	mg/L	<0.05	1	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.011	-
Sulphate	mg/L	119	500	-	-	253.575	0.1	16	16	19.7	12.6	14.6	15.1	15.2	17.5	17.2	17.8	16.5	23.3	24.3	24.6	15	25	19.6	51.8	1.9	5.5	6.8	7	7.3	6.2
Cations																															
Calcium (diss)	mg/L	330	-	-	-	-	0.05	60	61	329	291	269	273	269	296	294	297	272	285	307	297	330	310	23.5	22.2	22	21	23	22	19	24
Magnesium (diss)	mg/L	61.2	-	-	-	-	0.05	15	15	61.2	56.2	52.7	52	49.1	53.5	53.3	56.2	49	52	55.1	53	58	54	5.44	4.75	1.6	1.6	1.4	1.4	1.2	1.5
Potassium (diss)	mg/L	5.88	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium (diss)	mg/L	91.5	200	-	-	101.5	0.05	24	24	62.7	70	71.4	71.5	70.2	87.7	87.5	82.3	80.8	82.6	91.5	75.6	86	87	21.8	12.5	3	3.1	3	3	2.9	3.1
General Chemistry																															
Alkalinity (as CaCO3)	mg/L	1210	30 - 500	See Factsheet	-	47.75 - 282.75	1	170	160	1190	1210	978	983	1010	1070	1050	1020	976	940	954	963	970	1100	128	45	64	65	72	67	55	70
Ammonia as N	mg/L	6.48	-	-	-	-	0.02	0.2	0.14	<0.02	<0.02	0.03	0.04	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	0.17	0.08	0.46	0.57	<0.02	<0.02	0.059	0.052	0.058	0.05	<0.05	<0.05
Biochemical Oxygen Demand	mg/L	40	-	-	-	-	2	<2	<2	<5	<5	<5	<5	<5	2	<2	4	4	4	4	<2	<2	<2	<5	<2	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	177	-	-	-	-	4	<4	<4	57	41	35	41	36	47	41	35	38	42	25	42	52	43	177	<5	8.2	<4	<4	<4	<4	<4
Dissolved Organic Carbon	mg/L	185	5	-	-	3.475	0.4	4.1	4	14.7	17.1	14.7	17.2	17.8	19.5	18.9	18.7	17.9	16.8	16.9	15.2	16	15	31.6	2.4	2	1.5	1.5	1.3	2.2	1.3
Electrical Conductivity	uS/cm	2520	-	-	-	-	1	560	560	2120	2010	1830	1830	2520	1880	1850	2100	1920	1890	1830	1950	2100	2000	271	218	140	140	140	140	120	150
Hardness (as CaCO3)	mg/L	1073.5	80 - 100	-	-	-		-	-	1073.5	958.1	888.7	895.8	873.9	959.4	953.6	973	881	925.8	993.5	-	-	-	81.1	-	-	-	-	-	-	-
Lab Filtration DOC	unitless		-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	8.23	6.5 - 8.5	6.5 - 8.5	-	6.9275 - 7.9275		7.37	7.57	7.49	7.58	7.54	7.5	6.99	7.56	7.54	7	7.47	7.1	7.16	7.03	7.47	7.18	7.18	7.42	7.59	7.66	7.35	7.36	7.28	7.48
Total Dissolved Solids	mg/L	1300	500	-	-	390	5	205	340	1190	1170	1190	1240	1200	1200	1190	1240	1140	1140	1130	1150	1250	1300	178	108	340	340	1040	1110	590	120
Total Suspended Solids	mg/L	68700	-	-	-	-	10	2900	6000	16500	12100	7460	5020	4780	2310	2440	3100	4880	5210	2760	1500	11000	3400	4320	10500	38000	50000	39000	37000	33000	11000
Unionized Ammonia (Calc)	mg/L	0.0632438	-	-	-	-	0.1	-	-	-	0.0000088	-	-	-	-	-	-	-	-	-	-	-	-	0.0000725	-	-	-	-	-	-	-
Metals																															
Aluminum (diss, 0.45 µm)	mg/L	2.33	0.1	-	Calculated	0.051225	0.004	<0.0049	<0.0049	<0.004	<0.004	0.084	0.097	0.005	0.011	0.013	<0.004	<0.004	0.017	0.023	0.007	<0.0049	<0.0049	0.006	<0.004	<0.0049	<0.0049	<0.0049	<0.0049	0.022	<0.0049
Barium (diss)	mg/L	0.309	1	-	-	0.262	0.002	0.068	0.069	0.309	0.28	0.28	0.278	0.245	0.217	0.217	0.176	0.248	0.261	0.253	0.237	0.28	0.25	0.018	0.015	0.022	0.022	0.016	0.016	0.011	0.019
Beryllium (diss)	mg/L	<0.001	-	Calculated	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (diss)	mg/L	1.33	5	-	0.2	1.25563	0.01	0.15	0.15	**0.49**	**0.509**	**0.761**	**0.76**	**0.762**	**1.03**	**1.11**	**0.833**	**1.21**	**1.11**	1.33	**1.22**	**1.2**	**1.3**	0.011	0.015	0.01	<0.01	0.014	<0.01	<0.01	<0.01
Cadmium (diss)	mg/L	<0.002	0.005	-	Calculated	0.0012837	0.00009	0.000095	0.00011	<0.002	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00048	0.00019	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Chromium (diss)	mg/L	0.008	0.05	-	-	0.014375	0.002	<0.005	<0.005	<0.003	0.008	<0.003	<0.003	0.004	0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005	<0.005	<0.003	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt (diss)	mg/L	**0.1**	-	-	0.0009	-	0.0005	**0.021**	**0.022**	**0.028**	**0.0364**	**0.0399**	**0.0392**	**0.0387**	**0.0421**	**0.0424**	**0.0307**	**0.0508**	**0.0446**	**0.0654**	**0.0449**	**0.049**	**0.061**	0.0006	<0.0005	**0.0011**	**0.0011**	<0.0005	<0.0005	<0.0005	<0.0005
Copper (diss)	mg/L	<0.003	1	-	Calculated	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (diss)	mg/L	200	0.3	0.3	-	0.175	0.01	0.35	0.35	3.02	10.1	16.7	16.5	7.29	11	10.9	3.85	10.7	4.2	11.2	6.15	6	9.2	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead (diss)	mg/L	0.002	0.01	-	Calculated	0.0026875	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	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	13	0.05	-	-	0.04075	0.002	4.1	4.2	5.97	8.15	8.92	8.69	8.08	9.96	9.93	6.57	11.9	9.18	12.7	11.7	11	13	0.263	0.01	0.13	0.13	0.032	0.031	0.0071	0.035
Molybdenum (diss)	mg/L	0.003	-	-	0.04	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (diss)	mg/L	0.006	-	0.025	-	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	15.4	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (diss)	mg/L	<0.002	-	0.0001	-	-	0.00009	<0.00009	<0.00009	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Strontium (diss)	mg/L	2.07	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (diss)	mg/L	<0.006	-	-	0.0003	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (diss)	mg/L	0.003	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	<0.002	-	-	0.006	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (diss)	mg/L	325	5	-	0.02	2.50125	0.005	<0.005	<0.005	0.009	0.007	0.006	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	<0.005	<0.005	<0.005
VOCs																															
1,1,1,2-Tetrachloroethane	mg/L	<0.0005	-	-	0.02	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.0005	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	<0.0003	-	-	0.01	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0003	-	-	<0.0002	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	<0.0004	-	-	0.07	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.0004	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	<0.0004	-	-	0.8	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0004	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	0.00096	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	0.00096	-	-	0.00064	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	<0.0002	0.014	-	0.04	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0002	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/L	<0.0003	-	0.0005	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	<0.0003	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	<0.0004	0.003	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.0004	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	0.0011	0.005	-	0.1	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	-	0.0011	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	<0.0002	-	-	0.0007	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0002	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	<0.0004	-	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.0004	-	-	-	-	-	-	-	-
1,3-Dichloropropene (Cis + Trans)	mg/L	<0.0003	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	<0.0003	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	<0.0004	0.001	0.004	-	-	0.0001	-	-	-	-	<0.0004	-	-	<0.0004	-	-	<0.0004	<0.0004	<0.0001	-	-	<0.0004	-	-	-	-	-	-	-	-
2-Hexanone	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	<0.01	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	<0.01	-	-	-	-	-	-	-	-
Benzene	mg/L	0.00515	0.001	-	0.1	-	0.0002	-	-	-	-	0.0044	-	-	<0.0008	-	-	0.0039	0.00297	0.00515	-	-	0.0045	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/L	<0.0005	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0005	-	-	-	-	-	-	-	-
Bromoform	mg/L	<0.001	-	-	0.06	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.001	-	-	-	-	-	-	-	-
Bromomethane	mg/L	<0.0005	-	-	0.0009	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0005	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	<0.0002	0.002	-	-	-	0.00019	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.00019	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	<0.0002	-	0.015	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.0002	-	-	-	-	-	-	-	-
Chloroethane	mg/L	0.014	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	0.014	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0002	-	-	-	-	-	-	-	-
Chloromethane	mg/L	<0.0002	-	-	0.7	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	0.02	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	0.018	-	-	0.02	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	<0.0003	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0003	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	<0.0005	-	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.0005	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	<0.001	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	<0.0004	-	-	<0.001	-	-	-	-	-	-	-	-
Dichloromethane	mg/L	<0.002	0.05	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	<0.0012	-	-	-	<0.002	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	<0.0002	0.0016	-	0.008	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.0002	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	<0.00019	-	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.00019	-	-	-	-	-	-	-	-
Hexane	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	<0.0012	-	-	0.1	-	0.0003	-	-	-	-	<0.0012	-	-	<0.0012	-	-	<0.0012	-	<0.0003	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	<0.01	-	-	0.4	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	<0.01	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	<0.005	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	<0.005	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTB	mg/L	<0.0005	0.015	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0005	-	-	-	-	-	-	-	-
n-Hexane	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	<0.0002	-	-	0.04	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.0002	-	-	-	-	-	-	-	-
Styrene	mg/L	<0.0004	-	-	0.004	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	-	<0.0004	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	<0.0002	0.01	-	0.05	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0002	-	-	-	-	-	-	-	-
Toluene	mg/L	<0.0008	0.024	-	0.0008	-	0.0002	-	-	-	-	<0.0008	-	-	<0.0008	-	-	<0.0008	<0.0008	<0.0002	-	-	<0.0002	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	<0.0005	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0005	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	<0.0004	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	<0.0003	-	-	<0.0004	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	<0.0002	0.005	-	0.02	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	<0.0002	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	<0.0005	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	<0.0004	-	-	<0.0005	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	0.00299	0.001	-	0.6	-	0.00017	-	-	-	-	<0.00068	-	-	<0.00068	-	-	<0.00068	0.00211	0.00299	-	-	0.0014	-	-	-	-	-	-	-	-
Xylene Mixture	mg/L	<0.0002	0.02	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-
Xylenes, m+p	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-
Xylenes, total	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
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
Concentration exceeds RUV-MG	Reasonable Use Values Musclow Greenview

Hastings Highlands
Historical Groundwater Analytical Chemistry Results

Parameter	Units	Max Concentration	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	RUV-MG	Location	MG-18-3R	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2
							Sample ID	MG-18-3R	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP1	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2
							Sample Date	2025-Oct-16	2016-Oct-25	2017-May-11	2017-Oct-25	2018-May-09	2019-May-06	2019-Oct-21	2020-May-05	2020-Oct-08	2021-Apr-19	2021-Oct-20	2022-May-04	2022-Oct-25	2023-May-02	2023-Oct-18	2024-May-01	2024-Oct-30	2025-May-05	2025-Oct-16	2016-Oct-25	2017-May-11	2017-Oct-25	2018-May-09	2018-Oct-24
							Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions							Detection Limit																						
Chloride	mg/L	160	250	-	-	125.25	0.1	<1	26.5	27.4	31.7	33.1	29.5	35.8	36.2	41.3	42.3	45.1	49.6	50.7	52.2	44	46	45	38	40	0.74	1.05	0.95	1.11	0.99
Nitrate + Nitrite	mg/L	<0.5	-	-	-		0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-
Nitrate as N	mg/L	3.18	10	-	-	2.5375	0.05	<0.1	<0.25	<0.1	<0.1	<0.1	<0.25	<0.25	<0.25	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L	<0.05	1	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	-
Sulphate	mg/L	119	500	-	-	253.575	0.1	8.3	106	111	112	114	98.9	111	108	107	103	111	113	119	116	110	110	98	92	98	4.82	8.48	5.34	5.73	3.34
Cations																															
Calcium (diss)	mg/L	330	-	-	-	-	0.05	21	126	123	135	126	122	120	122	128	131	120	130	172	140	150	140	130	140	130	44.7	41.3	45.3	45.6	43.2
Magnesium (diss)	mg/L	61.2	-	-	-	-	0.05	1.3	9.46	9.82	10.4	9.21	9.25	9.62	9.41	9.55	10.5	9.34	10.6	12	11.4	11	11	10	11	10	3.7	3.67	3.91	3.72	3.57
Potassium (diss)	mg/L	5.88	-	-	-	-	1	-	5.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.33	-	-	-	-
Sodium (diss)	mg/L	91.5	200	-	-	101.5	0.05	2.8	7.15	6.58	8.3	7.05	7.02	8.6	7.69	8.38	8.69	8.45	9	13.1	10	12	12	12	13	14	4.31	4.15	4.39	4.09	4.12
General Chemistry																															
Alkalinity (as CaCO3)	mg/L	1210	30 - 500	See Factsheet	-	47.75 - 282.75	1	62	253	230	248	252	281	238	230	247	226	224	218	250	239	250	240	250	240	240	166	144	160	164	137
Ammonia as N	mg/L	6.48	-	-	-	-	0.02	<0.05	0.22	0.17	0.17	0.17	0.15	0.24	0.13	0.15	0.18	0.06	0.14	0.19	0.19	0.29	0.28	0.28	0.24	0.29	5.9	5.5	5.3	6.48	5.56
Biochemical Oxygen Demand	mg/L	40	-	-	-	-	2	<2	-	-	<5	<5	<5	<5	8	<2	<6	<2	<2	<2	<2	<2	<2	<2	<2	<2	-	6	<5	10	<5
Chemical Oxygen Demand	mg/L	177	-	-	-	-	4	<4	9	10	30	13	25	14	17	15	7	11	23	12	<5	17	17	15	7.5	10	18	20	59	27	25
Dissolved Organic Carbon	mg/L	185	5	-	-	3.475	0.4	1.9	6.3	7.4	59.9	30	14.8	4.9	9.4	9.2	5.7	8.5	6.4	5.9	4.8	6.4	6.4	5.9	5.2	9.1	11	13.1	60.4	34.5	20.2
Electrical Conductivity	uS/cm	2520	-	-	-	-	1	130	709	783	659	687	717	707	904	721	791	752	777	800	812	830	810	810	780	760	316	320	281	302	336
Hardness (as CaCO3)	mg/L	1073.5	80 - 100	-	-	-		-	353.6	347.6	379.9	352.5	342.7	339.3	343.4	358.9	370.3	338.1	368.3	478.9	-	-	-	-	-	-	126.9	118.2	129.2	129.2	122.6
Lab Filtration DOC	unitless		-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	8.23	6.5 - 8.5	6.5 - 8.5	-	6.9275 - 7.9275		7.32	7.59	8.09	8.13	7.93	7.89	7.77	7.6	7.96	7.57	7.69	7.48	7.86	7.65	8.02	7.82	7.79	7.99	7.77	6.85	7.69	7.68	7.67	7.74
Total Dissolved Solids	mg/L	1300	500	-	-	390	5	220	472	-	466	462	432	492	460	490	498	508	508	522	540	610	600	565	540	465	190	-	186	168	184
Total Suspended Solids	mg/L	68700	-	-	-	-	10	5600	-	-	<10	<10	1180	82	12	10	11	48	<10	22	11	<10	<10	<10	<10	<10	-	-	70	<10	<10
Unionized Ammonia (Calc)	mg/L	0.0632438	-	-	-	-	0.1	-	0.0012767	0.0632438	0.0006925	0.0007636	0.000284	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0063139	0.0028034	0.0025075	0.0033585	-
Metals																															
Aluminum (diss, 0.45 µm)	mg/L	2.33	0.1	-	Calculated	0.051225	0.004	0.0094	<0.004	0.01	0.009	<0.004	0.006	0.022	0.008	0.013	0.021	0.012	0.013	0.016	<0.004	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.004	0.011	0.007	0.006	0.018
Barium (diss)	mg/L	0.309	1	-	-	0.262	0.002	0.013	0.074	0.06	0.07	0.063	0.066	0.076	0.071	0.063	0.069	0.069	0.074	0.083	0.069	0.085	0.074	0.079	0.073	0.075	0.039	0.043	0.04	0.03	0.04
Beryllium (diss)	mg/L	<0.001	-	Calculated	-	-	0.001	-	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-
Boron (diss)	mg/L	1.33	5	-	0.2	1.25563	0.01	<0.01	0.087	0.063	0.077	0.066	0.05	0.097	0.06	0.081	0.059	0.067	0.049	0.078	0.061	0.072	0.058	0.064	0.057	0.06	0.063	**0.576**	**0.258**	0.09	0.073
Cadmium (diss)	mg/L	<0.002	0.005	-	Calculated	0.0012837	0.00009	<0.00009	<0.001	<0.001	<0.001	<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	<0.001	<0.001	<0.001	<0.0001	0.0003
Chromium (diss)	mg/L	0.008	0.05	-	-	0.014375	0.002	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	0.006	0.003	<0.003	<0.003
Cobalt (diss)	mg/L	**0.1**	-	-	0.0009	-	0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<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
Copper (diss)	mg/L	<0.003	1	-	Calculated	-	0.001	-	<0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.003	-	-	-	-
Iron (diss)	mg/L	200	0.3	0.3	-	0.175	0.01	<0.1	0.158	0.675	0.239	0.125	0.226	<0.01	<0.01	<0.01	0.033	0.028	0.026	0.04	0.016	<0.1	<0.1	<0.1	<0.1	<0.1	0.039	0.946	0.518	0.223	0.16
Lead (diss)	mg/L	0.002	0.01	-	Calculated	0.0026875	0.0005	<0.0005	<0.002	<0.002	<0.002	<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	<0.002	<0.002	<0.002	<0.001	<0.001
Manganese (diss)	mg/L	13	0.05	-	-	0.04075	0.002	0.0047	0.138	0.161	0.134	0.134	0.141	0.149	0.166	0.13	0.163	0.144	0.163	0.185	0.144	0.15	0.15	0.13	0.14	0.13	0.104	0.171	0.111	0.082	0.074
Molybdenum (diss)	mg/L	0.003	-	-	0.04	-	0.005	-	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.002	-	-	-	-
Nickel (diss)	mg/L	0.006	-	0.025	-	-	0.005	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004	-	-	-	-
Silicon (diss)	mg/L	15.4	-	-	-	-	0.1	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-
Silver (diss)	mg/L	<0.002	-	0.0001	-	-	0.00009	<0.00009	<0.002	<0.002	<0.002	<0.002	<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	<0.002	<0.002	<0.002	<0.002	<0.002
Strontium (diss)	mg/L	2.07	-	-	-	-	0.001	-	2.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.379	-	-	-	-
Thallium (diss)	mg/L	<0.006	-	-	0.0003	-	0.0001	-	<0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.006	-	-	-	-
Titanium (diss)	mg/L	0.003	-	-	-	-	0.002	-	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.002	-	-	-	-
Vanadium (diss)	mg/L	<0.002	-	-	0.006	-	0.001	-	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.002	-	-	-	-
Zinc (diss)	mg/L	325	5	-	0.02	2.50125	0.005	<0.005	0.006	**0.036**	0.006	<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	<0.005	<0.005	<0.005	0.013
VOCs																															
1,1,1,2-Tetrachloroethane	mg/L	<0.0005	-	-	0.02	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	<0.0003	-	-	0.01	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	<0.0004	-	-	0.07	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	<0.0004	-	-	0.8	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	0.00096	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	<0.0002	0.014	-	0.04	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/L	<0.0003	-	0.0005	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	<0.0004	0.003	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	0.0011	0.005	-	0.1	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	<0.0002	-	-	0.0007	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	<0.0004	-	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropene (Cis + Trans	mg/L	<0.0003	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	<0.0004	0.001	0.004	-	-	0.0001	-	-	-	-	<0.0000001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000001	<0.0000004
2-Hexanone	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	<0.01	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	0.00515	0.001	-	0.1	-	0.0002	-	-	-	-	<0.0000002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000002	<0.0000008
Bromodichloromethane	mg/L	<0.0005	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	<0.001	-	-	0.06	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	<0.0005	-	-	0.0009	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	<0.0002	0.002	-	-	-	0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	<0.0002	-	0.015	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	mg/L	0.014	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	mg/L	<0.0002	-	-	0.7	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	0.02	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	<0.0003	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	<0.0005	-	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	<0.001	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	mg/L	<0.002	0.05	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	<0.0002	0.0016	-	0.008	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	<0.00019	-	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexane	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	<0.0012	-	-	0.1	-	0.0003	-	-	-	-	<0.0000003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000003	<0.0000012
Methyl Ethyl Ketone	mg/L	<0.01	-	-	0.4	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	<0.005	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTB	mg/L	<0.0005	0.015	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	<0.0002	-	-	0.04	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	<0.0004	-	-	0.004	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	<0.0002	0.01	-	0.05	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	<0.0008	0.024	-	0.0008	-	0.0002	-	-	-	-	0.0000002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000002	<0.0000008
trans-1,2-Dichloroethylene	mg/L	<0.0005	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	<0.0004	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	<0.0002	0.005	-	0.02	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	<0.0005	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	0.00297	0.001	-	0.6	-	0.00017	-	-	-	-	<0.0000002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000002	<0.0000007
Xylene Mixture	mg/L	<0.0002	0.02	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, m+p	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, total	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
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
Concentration exceeds RUV-MG	Reasonable Use Values Musclow Greenview

Hastings Highlands Historical Groundwater Analytical Chemistry Results							Location	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3
							Sample ID	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP2	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3
Parameter	Units	Max Concentration	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	RUV-MG	Sample Date	2019-May-06	2019-Oct-21	2020-May-05	2020-Oct-08	2021-Apr-19	2021-Oct-20	2022-May-04	2022-Oct-25	2023-May-02	2023-Oct-18	2024-May-01	2024-Oct-30	2025-May-05	2025-Oct-16	2016-Oct-25	2017-May-11	2017-Oct-25	2018-May-09	2018-Oct-24	2019-May-06	2019-Oct-21	2020-May-05	2020-Oct-08	2021-Apr-19
							Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions							Detection Limit																						
Chloride	mg/L	160	250	-	-	125.25	0.1	0.97	0.64	0.92	0.86	1.06	0.68	0.63	1.07	1.04	<1	<1	<1	1.9	<1	56.2	62.6	72	83.6	77.2	82.5	76.7	85.5	74.7	77.6
Nitrate + Nitrite	mg/L	<0.5	-	-	-		0.1	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	3.18	10	-	-	2.5375	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.25	<0.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Nitrite as N	mg/L	<0.05	1	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate	mg/L	119	500	-	-	253.575	0.1	1.37	2.2	0.96	5.84	1.78	3.29	1.12	1.05	3.09	<1	4.8	2.1	1.5	4.6	62.2	71.5	52.3	65.8	55.7	62.2	48.5	52.4	43.3	43.3
Cations																															
Calcium (diss)	mg/L	330	-	-	-	-	0.05	45.3	41.7	42.7	41.6	43.1	42.6	43.4	49.3	47.4	47	50	46	48	43	121	132	152	155	158	193	183	212	223	234
Magnesium (diss)	mg/L	61.2	-	-	-	-	0.05	3.94	3.67	3.68	3.42	3.82	3.5	3.76	4.58	4.42	4	4.2	3.9	4.1	3.7	13.7	15.6	18.1	17.9	19	23	25.3	25	24.8	29.4
Potassium (diss)	mg/L	5.88	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.69	-	-	-	-	-	-	-	-	-
Sodium (diss)	mg/L	91.5	200	-	-	101.5	0.05	4.23	4.14	4.07	3.87	4.17	3.99	4.29	6.94	4.26	4.4	4.5	4.2	4.8	4	15.2	13.9	19.5	17.8	22.3	22.3	28.6	36.3	43.4	49
General Chemistry																															
Alkalinity (as CaCO3)	mg/L	1210	30 - 500	See Factsheet	-	47.75 - 282.75	1	187	155	162	160	159	158	154	171	158	160	160	170	220	160	279	323	352	373	353	558	474	530	575	593
Ammonia as N	mg/L	6.48	-	-	-	-	0.02	5.08	5.73	5.88	5.46	6.16	0.25	5.32	5.61	5.65	5.9	6	5.9	6.2	5.8	0.21	0.05	0.21	0.09	0.27	0.09	0.36	0.08	0.22	0.07
Biochemical Oxygen Demand	mg/L	40	-	-	-	-	2	9	<5	11	<2	5	<2	<2	<2	<2	5	<2	<2	<2	<2	-	-	<5	<5	<5	<5	<5	<5	2	<2
Chemical Oxygen Demand	mg/L	177	-	-	-	-	4	32	18	20	54	93	31	32	27	13	36	63	57	21	20	15	13	47	56	122	61	23	56	34	52
Dissolved Organic Carbon	mg/L	185	5	-	-	3.475	0.4	10.9	30.2	23.1	53.9	13.7	44.7	21.3	54.2	7.6	17	7.9	9.1	19	17	26.3	8.1	185	56.9	39	38.2	32.6	33.6	34.8	28.6
Electrical Conductivity	uS/cm	2520	-	-	-	-	1	317	295	391	296	333	308	316	321	306	330	320	330	340	320	776	915	828	915	112	1180	1090	1580	1200	1440
Hardness (as CaCO3)	mg/L	1073.5	80 - 100	-	-	-		129.3	119.2	121.8	118	123.4	120.8	123.9	142	-	-	-	-	-	-	358.6	393.8	454.1	460.7	472.8	576.6	561.1	632.3	659	705.4
Lab Filtration DOC	unitless		-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	8.23	6.5 - 8.5	6.5 - 8.5	-	6.9275 - 7.9275		7.48	7.5	7.09	7.64	7.14	7.48	7.12	7.45	7.25	7.71	7.32	7.66	7.77	7.27	6.72	7.97	7.78	7.79	7.53	7.6	7.41	7.02	7.55	6.89
Total Dissolved Solids	mg/L	1300	500	-	-	390	5	178	208	174	174	188	186	172	172	184	190	190	200	175	110	494	-	570	610	636	728	702	782	768	850
Total Suspended Solids	mg/L	68700	-	-	-	-	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	<10	<10	<10	52	29	<10	<10	<10
Unionized Ammonia (Calc)	mg/L	0.0632438	-	-	-	-	0.1	0.00435	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0001565	0.0000216	0.0000941	0.0000159	0.000045	0.0000304	-	-	-	-
Metals																															
Aluminum (diss, 0.45 µm)	mg/L	2.33	0.1	-	Calculated	0.051225	0.004	0.006	0.008	0.008	0.013	<0.004	0.011	0.013	0.014	0.006	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.004	0.005	0.014	<0.004	<0.004	0.009	0.005	0.006	0.01	<0.004
Barium (diss)	mg/L	0.309	1	-	0.262		0.002	0.031	0.03	0.034	0.026	0.028	0.029	0.032	0.032	0.031	0.031	0.03	0.031	0.032	0.03	0.124	0.106	0.137	0.14	0.198	0.182	0.221	0.23	0.204	0.219
Beryllium (diss)	mg/L	<0.001	-	Calculated	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
Boron (diss)	mg/L	1.33	5	-	0.2	1.25563	0.01	0.05	0.065	0.036	0.043	0.029	0.034	0.017	0.037	0.038	0.045	0.028	0.027	0.028	0.03	0.158	0.155	**0.239**	**0.214**	**0.254**	**0.261**	**0.359**	**0.459**	**0.447**	**0.551**
Cadmium (diss)	mg/L	<0.002	0.005	-	Calculated	0.0012837	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	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (diss)	mg/L	0.008	0.05	-	-	0.014375	0.002	<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	<0.003	<0.003	0.006	<0.003	0.006	<0.003	<0.003	<0.003	<0.003
Cobalt (diss)	mg/L	**0.1**	-	-	0.0009	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.001**	**0.001**	**0.002**	**0.002**	<0.002	**0.0025**	**0.0025**	**0.0029**	**0.0025**	**0.003**
Copper (diss)	mg/L	<0.003	1	-	Calculated	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.003	-	-	-	-	-	-	-	-	-
Iron (diss)	mg/L	200	0.3	0.3	-	0.175	0.01	0.204	0.057	0.204	<0.01	0.215	0.106	0.098	0.05	0.018	<0.1	<0.1	<0.1	<0.1	<0.1	0.377	0.333	0.284	0.291	0.453	0.84	0.428	0.229	0.314	0.288
Lead (diss)	mg/L	0.002	0.01	-	Calculated	0.0026875	0.0005	<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	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	13	0.05	-	-	0.04075	0.002	0.08	0.075	0.079	0.06	0.067	0.06	0.07	0.065	0.068	0.067	0.07	0.066	0.071	0.064	0.867	0.475	0.199	0.23	0.203	0.292	0.163	0.139	0.133	0.151
Molybdenum (diss)	mg/L	0.003	-	-	0.04	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.002	-	-	-	-	-	-	-	-	-
Nickel (diss)	mg/L	0.006	-	0.025	-	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.006	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	15.4	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.4	-	-	-	-	-	-	-	-	-
Silver (diss)	mg/L	<0.002	-	0.0001	-	-	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	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Strontium (diss)	mg/L	2.07	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.748	-	-	-	-	-	-	-	-	-
Thallium (diss)	mg/L	<0.006	-	-	0.0003	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.006	-	-	-	-	-	-	-	-	-
Titanium (diss)	mg/L	0.003	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.002	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	<0.002	-	-	0.006	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.002	-	-	-	-	-	-	-	-	-
Zinc (diss)	mg/L	325	5	-	0.02	2.50125	0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.006	0.018	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs																															
1,1,1,2-Tetrachloroethane	mg/L	<0.0005	-	-	0.02	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	<0.0003	-	-	0.01	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	<0.0004	-	-	0.07	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	<0.0004	-	-	0.8	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	0.00096	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	<0.0002	0.014	-	0.04	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/L	<0.0003	-	0.0005	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	<0.0004	0.003	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	0.0011	0.005	-	0.1	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	<0.0002	-	-	0.0007	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	<0.0004	-	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropene (Cis + Trans	mg/L	<0.0003	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	<0.0004	0.001	0.004	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000004	<0.0000004	-	-	-	-	-
2-Hexanone	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	<0.01	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	0.00515	0.001	-	0.1	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000008	<0.0000008	-	-	-	-	-
Bromodichloromethane	mg/L	<0.0005	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	<0.001	-	-	0.06	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	<0.0005	-	-	0.0009	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	<0.0002	0.002	-	-	-	0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	<0.0002	-	0.015	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	mg/L	0.014	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	mg/L	<0.0002	-	-	0.7	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	0.02	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	<0.0003	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	<0.0005	-	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	<0.001	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	mg/L	<0.002	0.05	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	<0.0002	0.0016	-	0.008	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	<0.00019	-	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexane	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	<0.0012	-	-	0.1	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000012	<0.0000012	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	<0.01	-	-	0.4	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	<0.005	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTB	mg/L	<0.0005	0.015	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	<0.0002	-	-	0.04	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	<0.0004	-	-	0.004	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	<0.0002	0.01	-	0.05	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	<0.0008	0.024	-	0.0008	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000008	<0.0000008	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	<0.0005	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	<0.0004	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	<0.0002	0.005	-	0.02	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	<0.0005	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	0.00297	0.001	-	0.6	-	0.00017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000007	<0.0000007	-	-	-	-	-
Xylene Mixture	mg/L	<0.0002	0.02	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, m+p	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, total	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
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
Concentration exceeds RUV-MG	Reasonable Use Values Musclow Greenview

Hastings Highlands Historical Groundwater Analytical Chemistry Results							Location	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4
							Sample ID	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP3	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP4
Parameter	Units	Max Concentration	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	RUV-MG	Sample Date	2021-Oct-20	2022-May-04	2022-Oct-25	2023-May-02	2023-Oct-18	2024-May-01	2024-Oct-30	2025-May-05	2025-Oct-16	2016-Oct-25	2017-May-11	2017-Oct-25	2018-May-09	2018-Oct-24	2019-May-06	2019-Oct-21	2020-May-05	2020-Oct-08	2021-Apr-19	2021-Oct-20	2022-May-04	2022-Oct-25	2023-May-02	2023-Oct-18
							Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions							Detection Limit																							
Chloride	mg/L	160	250	-	-	125.25	0.1	73.6	75.2	77.3	77.7	57	69	70	74	90	2.01	3.19	1.78	1.82	1.64	2.16	1.52	1.9	1.73	2.89	2.46	3.36	4.2	4.94	2.8
Nitrate + Nitrite	mg/L	<0.5	-	-	-		0.1							<0.1																	
Nitrate as N	mg/L	3.18	10	-	-	2.5375	0.05	<0.05	1.8	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	0.08	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	0.12	0.12	0.13
Nitrite as N	mg/L	<0.05	1	-	-	-	0.01	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate	mg/L	119	500	-	-	253.575	0.1	44.1	42.5	39.2	37	24	35	34	32	32	14.3	7.77	13.8	17.2	14.2	13.3	13.6	14	12.5	13.2	9.86	12.6	13.8	13.2	11
Cations																															
Calcium (diss)	mg/L	330	-	-	-	-	0.05	225	231	279	250	260	260	240	270	250	33.7	37.6	36.2	32.7	33.8	36.6	32	33.8	29.1	33.2	26.4	29.4	29.5	33.3	31
Magnesium (diss)	mg/L	61.2	-	-	-	-	0.05	26.8	28.8	33.5	31.3	33	36	30	36	37	4.54	5.33	5.12	4.27	4.69	5.1	4.68	4.92	4.51	5.11	4.11	4.75	5.2	4.79	4.6
Potassium (diss)	mg/L	5.88	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium (diss)	mg/L	91.5	200	-	-	101.5	0.05	52.2	58.2	76.2	48.6	71	59	52	59	66	5.32	5.86	5.2	4.31	4.81	4.89	4.8	4.76	4.62	4.88	4.08	4.66	5.65	4.52	4.8
General Chemistry																															
Alkalinity (as CaCO3)	mg/L	1210	30 - 500	See Factsheet	-	47.75 - 282.75	1	614	631	678	736	680	720	720	750	710	120	130	115	110	95	132	107	107	104	103	87	93	101	103	96
Ammonia as N	mg/L	6.48	-	-	-	-	0.02	5.28	<0.02	0.21	0.05	0.53	0.37	0.26	0.14	0.57	0.1	0.07	<0.02	0.04	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.15	<0.02	<0.02	<0.02	<0.05
Biochemical Oxygen Demand	mg/L	40	-	-	-	-	2	3	4	3	<2	<2	<2	<2	<2	<2	-	-	6	<5	<5	<5	<5	<5	2	<2	<2	3	7	<2	12
Chemical Oxygen Demand	mg/L	177	-	-	-	-	4	15	47	41	25	54	62	76	28	24	9	19	7	23	25	13	45	13	<5	62	70	14	7	18	29
Dissolved Organic Carbon	mg/L	185	5	-	-	3.475	0.4	44.2	27.1	30.4	12.2	22	11	18	10	23	7.4	4.4	7	23.3	15	3.9	3.9	10.1	18.9	24.5	37.6	18.3	28.8	1.7	11
Electrical Conductivity	uS/cm	2520	-	-	-	-	1	1360	1410	1360	1480	1500	1500	1500	1600	1600	242	297	215	227	256	251	223	283	209	249	188	214	233	229	230
Hardness (as CaCO3)	mg/L	1073.5	80 - 100	-	-	-		672.2	695.4	834.6	-	-	-	-	-	-	102.8	115.8	111.5	99.2	103.7	112.4	99.2	104.7	91.2	103.9	82.8	93	95.1	-	-
Lab Filtration DOC	unitless		-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	8.23	6.5 - 8.5	6.5 - 8.5	-	6.9275 - 7.9275		7.34	7.11	7.17	6.99	7.59	7.35	7.65	7.14	7.32	7.41	7.92	7.65	7.4	7.49	7.43	7.41	7.74	7.23	7.85	7.67	7.48	7.96	7.85	7.96
Total Dissolved Solids	mg/L	1300	500	-	-	390	5	832	822	834	882	910	960	955	955	945	54	-	174	136	-	138	168	138	128	138	140	134	132	102	155
Total Suspended Solids	mg/L	68700	-	-	-	-	10	<10	<10	<10	<10	<10	<10	<10	20	<10	-	-	2360	40	-	134	204	59	<10	122	113	167	111	14	82
Unionized Ammonia (Calc)	mg/L	0.0632438	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	0.0011711	0.0005174	0.0005155	-	-	-	-	-	-	-	-	-	-	-	-
Metals																															
Aluminum (diss, 0.45 µm)	mg/L	2.33	0.1	-	Calculated	0.051225	0.004	0.011	0.024	0.01	<0.004	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	0.04	0.006	0.018	0.005	0.008	0.007	0.006	0.008	0.016	<0.004	0.01	0.013	0.086	<0.004	<0.0049
Barium (diss)	mg/L	0.309	1	-	-	0.262	0.002	0.22	0.234	0.254	0.172	0.25	0.18	0.19	0.19	0.22	0.025	0.013	0.013	0.013	0.015	0.015	0.013	0.014	0.011	0.012	0.011	0.012	0.011	0.012	0.011
Beryllium (diss)	mg/L	<0.001	-	Calculated	-	-	0.001	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (diss)	mg/L	1.33	5	-	0.2	1.25563	0.01	**0.541**	**0.664**	**0.8**	**0.52**	**0.81**	**0.55**	**0.52**	**0.62**	**0.75**	0.086	0.137	0.024	0.026	0.026	0.016	0.042	0.022	0.045	0.018	0.03	<0.01	0.024	0.015	0.014
Cadmium (diss)	mg/L	<0.002	0.005	-	Calculated	0.0012837	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Chromium (diss)	mg/L	0.008	0.05	-	-	0.014375	0.002	<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	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	<0.002	<0.002	<0.005
Cobalt (diss)	mg/L	**0.1**	-	-	0.0009	-	0.0005	**0.0025**	**0.0039**	**0.0038**	**0.0038**	**0.0034**	**0.0042**	**0.0036**	**0.0055**	**0.0035**	**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	<0.0005	<0.0005
Copper (diss)	mg/L	<0.003	1	-	Calculated	-	0.001	-	-	-	-	-	-	-	-	-	<0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (diss)	mg/L	200	0.3	0.3	-	0.175	0.01	0.448	0.628	0.498	0.796	0.57	0.8	0.68	0.61	0.47	0.046	<0.01	<0.01	0.029	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.178	0.012	<0.01	<0.01	<0.1
Lead (diss)	mg/L	0.002	0.01	-	Calculated	0.0026875	0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	13	0.05	-	-	0.04075	0.002	0.166	0.201	0.169	0.343	0.19	0.36	0.36	0.43	0.42	0.254	0.036	0.023	0.007	0.005	0.011	<0.002	0.005	0.003	<0.002	0.009	0.004	<0.002	<0.002	<0.002
Molybdenum (diss)	mg/L	0.003	-	-	0.04	-	0.005	-	-	-	-	-	-	-	-	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (diss)	mg/L	0.006	-	0.025	-	-	0.005	-	-	-	-	-	-	-	-	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	15.4	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	11.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (diss)	mg/L	<0.002	-	0.0001	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009
Strontium (diss)	mg/L	2.07	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	0.228	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (diss)	mg/L	<0.006	-	-	0.0003	-	0.0001	-	-	-	-	-	-	-	-	-	<0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (diss)	mg/L	0.003	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	<0.002	-	-	0.006	-	0.001	-	-	-	-	-	-	-	-	-	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (diss)	mg/L	325	5	-	0.02	2.50125	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0062	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	0.013	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
VOCs																															
1,1,1,2-Tetrachloroethane	mg/L	<0.0005	-	-	0.02	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	<0.0003	-	-	0.01	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	<0.0004	-	-	0.07	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	<0.0004	-	-	0.8	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	0.00096	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	<0.0002	0.014	-	0.04	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/L	<0.0003	-	0.0005	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	<0.0004	0.003	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	0.0011	0.005	-	0.1	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	<0.0002	-	-	0.0007	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	<0.0004	-	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropene (Cis + Trans	mg/L	<0.0003	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	<0.0004	0.001	0.004	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000004	<0.0000004	-	-	-	-	-	-	-	-	-	-
2-Hexanone	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	<0.01	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	0.00515	0.001	-	0.1	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000008	<0.0000008	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/L	<0.0005	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	<0.001	-	-	0.06	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	<0.0005	-	-	0.0009	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	<0.0002	0.002	-	-	-	0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	<0.0002	-	0.015	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	mg/L	0.014	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	mg/L	<0.0002	-	-	0.7	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	0.02	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	<0.0003	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	<0.0005	-	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	<0.001	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	mg/L	<0.002	0.05	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	<0.0002	0.0016	-	0.008	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	<0.00019	-	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexane	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	<0.0012	-	-	0.1	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000012	<0.0000012	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	<0.01	-	-	0.4	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	<0.005	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTB	mg/L	<0.0005	0.015	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	<0.0002	-	-	0.04	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	<0.0004	-	-	0.004	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	<0.0002	0.01	-	0.05	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	<0.0008	0.024	-	0.0008	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000008	<0.0000008	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	<0.0005	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	<0.0004	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	<0.0002	0.005	-	0.02	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	<0.0005	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	0.00297	0.001	-	0.6	-	0.00017	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000007	<0.0000007	-	-	-	-	-	-	-	-	-	-
Xylene Mixture	mg/L	<0.0002	0.02	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, m+p	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, total	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
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
Concentration exceeds RUV-MG	Reasonable Use Values Musclow Greenview

Hastings Highlands Historical Groundwater Analytical Chemistry Results							Location	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP5	MG-DP5	MG-DP5	MG-DP5 MG-QAQC GW1-F22 (MG-DP5)	MG-DP5	MG-DP5	MG-DP5	MG-DP5	MG-DP5	MG-DP5
							Sample ID	MG-DP4	MG-DP4	MG-DP4	MG-DP4	MG-DP5	MG-DP5	MG-DP5	MG-QAQC GW1-F22 (MG-DP5)	MG-DP5	MG-DP5	MG-DP5	MG-DP5	MG-DP5	MG-DP5
Parameter	Units	Max Concentration	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	RUV-MG	Sample Date	2024-May-01	2024-Oct-30	2025-May-05	2025-Oct-16	2021-Oct-20	2022-May-04	2022-Oct-25	2022-Oct-25	2023-May-02	2023-Oct-18	2024-May-01	2024-Oct-30	2025-May-05	2025-Oct-16
							Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions							Detection Limit														
Chloride	mg/L	160	250	-	-	125.25	0.1	4.2	4	5.6	3.5	53	80.1	64.4	64.7	66	63	56	65	57	49
Nitrate + Nitrite	mg/L	<0.5	-	-	-		0.1	-	<0.1	-	-	-	-	-	-	-	-	-	<0.5	-	-
Nitrate as N	mg/L	3.16	10	-	-	2.5375	0.05	0.18	<0.1	0.14	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.5	<0.1	0.11
Nitrite as N	mg/L	<0.05	1	-	-	-	0.01	-	<0.01	-	-	-	-	-	-	-	-	-	<0.05	-	-
Sulphate	mg/L	119	500	-	-	253.575	0.1	12	16	12	14	78.9	79.7	74.5	74	52.3	53	30	42	40	39
Cations																					
Calcium (diss)	mg/L	330	-	-	-	-	0.05	33	28	33	31	127	58.6	79.5	80.1	113	120	120	130	120	160
Magnesium (diss)	mg/L	61.2	-	-	-	-	0.05	5.1	4.5	5.1	4.8	10.2	6.02	6.84	6.69	11.3	9.8	11	11	11	15
Potassium (diss)	mg/L	5.88	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium (diss)	mg/L	91.5	200	-	-	101.5	0.05	5.1	4.6	4.8	4.6	12.6	4.47	7.8	5.45	8.12	7.9	7.8	8.5	7.8	10
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	1210	30 - 500	See Factsheet	-	47.75 - 282.75	1	100	92	98	88	332	276	255	254	305	230	220	250	310	360
Ammonia as N	mg/L	6.48	-	-	-	-	0.02	<0.05	<0.05	<0.05	<0.05	0.11	0.05	0.06	0.05	0.06	0.078	0.11	0.082	0.085	0.16
Biochemical Oxygen Demand	mg/L	40	-	-	-	-	2	25	29	32	40	2	3	<2	2	<6	7	11	7	6	5
Chemical Oxygen Demand	mg/L	177	-	-	-	-	4	37	38	40	55	10	27	9	<5	25	42	53	41	41	23
Dissolved Organic Carbon	mg/L	185	5	-	-	3.475	0.4	3.8	5	5.3	4.9	9.5	11.4	7.3	7.1	7.1	9.7	11	11	11	10
Electrical Conductivity	uS/cm	2520	-	-	-	-	1	230	220	240	220	899	892	758	749	791	750	690	740	820	890
Hardness (as CaCO3)	mg/L	1073.5	80 - 100	-	-	-		-	-	-	-	359.1	171.1	226.7	227.6	-	-	-	-	-	-
Lab Filtration DOC	unitless		-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	8.23	6.5 - 8.5	6.5 - 8.5	-	6.9275 - 7.9275		8.23	7.82	8.21	7.8	7.29	6.9	7.33	7.19	6.87	7.06	6.98	7.06	7.23	7.15
Total Dissolved Solids	mg/L	1300	500	-	-	390	5	180	150	125	135	572	690	548	546	490	625	505	655	510	620
Total Suspended Solids	mg/L	68700	-	-	-	-	10	340	79	240	130	134	41	28	26	73	340	310	250	310	170
Unionized Ammonia (Calc)	mg/L	0.0632438	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																					
Aluminum (diss, 0.45 µm)	mg/L	2.33	0.1	-	Calculated	0.051225	0.004	<0.0049	<0.0049	0.0062	<0.0049	0.01	0.02	0.01	0.007	<0.004	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
Barium (diss)	mg/L	0.309	1	-	-	0.262	0.002	0.012	0.01	0.013	0.012	0.056	0.035	0.049	0.046	0.041	0.046	0.036	0.047	0.037	0.057
Beryllium (diss)	mg/L	<0.001	-	Calculated	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (diss)	mg/L	1.33	5	-	0.2	1.25563	0.01	0.019	0.013	0.018	0.014	0.08	0.014	0.028	0.037	0.031	0.038	0.045	0.045	0.06	0.1
Cadmium (diss)	mg/L	<0.002	0.005	-	Calculated	0.0012837	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	0.0005	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Chromium (diss)	mg/L	0.008	0.05	-	-	0.014375	0.002	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.002	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt (diss)	mg/L	**0.1**	-	-	0.0009	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0037**	**0.0122**	**0.0627**	**0.0557**	**0.068**	**0.1**	**0.037**	**0.046**	**0.031**	**0.046**
Copper (diss)	mg/L	<0.003	1	-	Calculated	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (diss)	mg/L	200	0.3	0.3	-	0.175	0.01	<0.1	<0.1	<0.1	<0.1	0.568	3.9	10.7	10.4	27.3	120	200	140	170	55
Lead (diss)	mg/L	0.002	0.01	-	Calculated	0.0026875	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	13	0.05	-	-	0.04075	0.002	0.0022	<0.002	<0.002	<0.002	0.95	0.864	1.41	1.27	2.79	3.9	2.9	2.8	1.9	2
Molybdenum (diss)	mg/L	0.003	-	-	0.04	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (diss)	mg/L	0.006	-	0.025	-	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	15.4	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (diss)	mg/L	<0.002	-	0.0001	-	-	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
Strontium (diss)	mg/L	2.07	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (diss)	mg/L	<0.006	-	-	0.0003	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (diss)	mg/L	0.003	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	<0.002	-	-	0.006	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (diss)	mg/L	325	5	-	0.02	2.50125	0.005	<0.005	<0.005	<0.005	<0.005	87.9	325	206	218	48.7	43	18	33	32	63
VOCs																					
1,1,1,2-Tetrachloroethane	mg/L	<0.0005	-	-	0.02	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	<0.0003	-	-	0.01	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	<0.0004	-	-	0.07	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	<0.0004	-	-	0.8	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	0.00096	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	<0.0002	0.014	-	0.04	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/L	<0.0003	-	0.0005	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	<0.0004	0.003	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	0.0011	0.005	-	0.1	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	<0.0002	-	-	0.0007	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	<0.0004	-	0.0025	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropene (Cis + Trans	mg/L	<0.0003	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	<0.0004	0.001	0.004	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	<0.01	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	0.00515	0.001	-	0.1	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/L	<0.0005	-	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	<0.001	-	-	0.06	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	<0.0005	-	-	0.0009	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	<0.0002	0.002	-	-	-	0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	<0.0002	-	0.015	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	mg/L	0.014	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	mg/L	<0.0002	-	-	0.7	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	0.02	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	<0.0003	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	<0.0005	-	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	<0.001	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	mg/L	<0.002	0.05	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	<0.0002	0.0016	-	0.008	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	<0.00019	-	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexane	mg/L	<0.001	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	<0.0012	-	-	0.1	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	<0.01	-	-	0.4	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	<0.005	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTB	mg/L	<0.0005	0.015	-	0.2	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	<0.0002	-	-	0.04	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	<0.0004	-	-	0.004	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	<0.0002	0.01	-	0.05	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	<0.0008	0.024	-	0.0008	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	<0.0005	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	<0.0004	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	<0.0002	0.005	-	0.02	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	<0.0005	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	0.00299	0.001	-	0.6	-	0.00017	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene Mixture	mg/L	<0.0002	0.02	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, m+p	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, total	mg/L	<0.0002	-	-	-	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
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
Concentration exceeds RUV-MG	Reasonable Use Values Musclow Greenview

Appendix E

E-2 Historical Surface Water Data

Hastings Highlands Historical Surface Water Analytical Chemistry Results						Location	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1
						Sample ID	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1	MG-SW1
Parameter	Units	MECP-GD-TA	MECP-GD-TB	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2015-May-06	2015-Oct-26	2016-Apr-27	2016-Oct-25	2017-May-11	2017-Oct-25	2018-May-09	2018-Oct-24	2019-May-06	2020-May-05	2020-Oct-08	2021-Apr-19	2021-Oct-20	2022-May-04	2023-May-02	2024-May-01	2024-Oct-30	2025-May-05
						Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions						**Detection Limit**																		
Chloride	mg/L	180	128	-	-	0.1	32.8	55.9	32.6	68.1	32.8	58.9	39.8	66.1	49.2	41.1	81.8	31.1	48.6	41.9	21	24	45	19
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1
Nitrate as N	mg/L	-	-	-	-	0.05	0.05	<0.25	0.07	<0.05	<0.05	<0.1	<0.05	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.1	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.25	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Sulphate	mg/L	100	-	-	-	0.1	37.7	10.7	34.8	11.8	40.4	23.2	30.6	4.18	39.1	43.1	3.14	49.8	32.9	28.7	30.5	39	17	29
Cations																								
Calcium (tot)	mg/L	-	-	-	-	0.05	59.6	77.8	47	68.4	45.4	98	48.6	66.4	49	57.23	79.19	62.4	106	52.6	31.8	48	92	51
Magnesium (tot)	mg/L	-	-	-	-	0.05	2.04	3.86	2.28	4.12	1.88	4.09	2.12	3.78	2.52	2.62	5.34	2.75	6.2	3.14	1.51	2	4.1	2
Potassium (tot)	mg/L	-	-	-	-	0.05	1.36	2.81	1.68	2.6	1.35	2.6	1.58	2.11	1.69	1.66	2.99	1.49	2.92	2.08	0.94	1.2	2.1	1.2
Sodium (tot)	mg/L	-	-	-	-	0.05	14.1	21.3	17.7	21.8	16.5	26.3	18.7	23.5	21.1	22.1	28.71	22.2	33.9	23.7	12	19	27	16
Field Parameters																								
pH (Field)	pH units	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	7.14
Temperature	deg. C	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.4	-	11.5
General Chemistry																								
Alkalinity (as CaCO3)	mg/L	-	-	See Factsheet	-	1	103	176	91	150	87	226	103	135	93	101	182	118	234	107	82	100	240	120
Ammonia as N	mg/L	-	-	-	-	0.02	0.16	<0.02	<0.02	0.07	<0.02	0.15	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	0.1	<0.02	<0.02	<0.05	0.11	0.057
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	46	<5	<5	<5	<5	<5	<5	2	<2	<2	2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	16	57	23	645	24	77	14	8	19	22	34	20	21	24	26	24	29	23
Colour	TCU	-	-	-	-	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	uS/cm	-	-	-	-	1	388	525	335	497	386	563	359	541	397	518	572	453	654	388	281	360	630	360
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	157.2	210.2	126.7	187.8	121.1	261.5	130	181	133	154	220	167	290	144	85.6	130	300	150
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
pH	pH units	6 - 9	-	6.5 - 8.5	-		7.62	7.92	7.95	7.72	7.8	7.91	7.3	7.82	7.31	7.42	7.78	7.49	7.75	7.49	7.42	7.75	7.7	7.65
Phenols	mg/L	0.04	0.004	0.001	-	0.001	<0.001	<0.001	<0.001	**0.002**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.011	<0.001	<0.001	**0.0023**	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	266	278	218	318	204	386	220	338	254	256	384	266	396	218	180	205	385	250
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.79	1.44	0.34	26	0.39	1.55	0.7	0.25	<0.1	0.41	0.37	0.33	0.43	0.33	0.4	0.38	0.44	0.44
Total Phosphorus	mg/L	-	-	0.03	-	0.01	0.03	**0.06**	<0.01	**1.5**	0.01	**0.23**	**0.09**	<0.02	<0.01	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.023	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	2250	30	36	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	-	-	-	0.0000066	-	-	-	-	-	<0.000002	<0.00061	<0.00061	<0.00061
Metals																								
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	0.088	0.032	<0.005	0.013
Aluminum (diss, 0.45 µm)	mg/L	-	-	-	Calculated	0.004	-	-	-	-	-	-	-	-	0.023	0.024	0.004	0.017	0.012	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.016	0.004	0.028	0.011	0.04	0.013	0.018	0.005	-	0.034	0.017	0.03	0.017	-	-	-	-	-
Arsenic (tot)	mg/L	-	-	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (tot)	mg/L	2.3	-	-	-	0.002	0.033	0.049	0.023	0.151	0.027	0.082	0.035	0.043	0.038	0.034	0.053	0.033	0.062	0.041	0.031	0.028	0.064	0.032
Beryllium (tot)	mg/L	-	-	Calculated	-	0.01	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (tot)	mg/L	3.55	1.5	-	0.2	0.01	<0.01	<0.01	<0.01	0.018	<0.01	0.014	<0.01	0.01	<0.01	<0.01	0.031	<0.01	0.011	0.137	0.015	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	0.00021	0.000017	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	0.0005	<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
Chromium (tot)	mg/L	0.064	-	-	-	0.001	<0.003	<0.003	<0.003	<0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt (tot)	mg/L	-	-	-	0.0009	0.0005	0.0006	<0.0005	<0.0005	0.0039	<0.0005	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00052	<0.0005
Copper (tot)	mg/L	0.0069	-	-	Calculated	0.0009	<0.002	<0.002	<0.002	0.02	<0.002	0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.0016	<0.0009	0.0016
Iron (tot)	mg/L	1	-	0.3	-	0.01	**2.24**	**3.13**	0.05	**50.4**	0.14	**18.7**	**0.55**	**0.44**	0.054	0.109	**0.679**	0.186	**1.22**	**0.398**	0.156	0.19	**2.4**	**0.55**
Lead (tot)	mg/L	0.002	-	-	Calculated	0.0005	<0.001	<0.001	<0.001	0.008	<0.001	<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
Manganese (tot)	mg/L	-	-	-	-	0.002	0.481	0.332	0.016	0.679	0.013	1.43	0.461	0.244	0.024	0.019	0.336	0.029	0.567	0.073	0.009	0.017	2.7	0.087
Mercury (diss)	mg/L	-	-	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (tot)	mg/L	-	-	-	0.04	0.004	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (tot)	mg/L	-	-	0.025	-	0.003	<0.003	<0.003	<0.003	0.009	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium (tot)	mg/L	-	-	0.1	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (tot)	mg/L	-	-	-	-	0.002	3.64	5.34	3.67	8.92	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	-	-	0.0001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (tot)	mg/L	-	-	-	-	0.01	0.335	0.542	0.27	0.577	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (tot)	mg/L	-	-	-	0.0003	0.0001	<0.0003	<0.0003	<0.0003	<0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (tot)	mg/L	-	-	-	-	0.003	<0.002	0.006	<0.002	0.088	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (tot)	mg/L	-	-	-	0.006	0.0005	<0.002	<0.002	<0.002	0.013	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (tot)	mg/L	0.089	0.03	-	0.02	0.001	<0.005	0.008	0.008	0.223	0.006	0.018	0.006	<0.005	0.009	0.006	<0.005	<0.005	<0.02	<0.02	<0.02	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim

Hastings Highlands Historical Surface Water Analytical Chemistry Results						Location	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW3
						Sample ID	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW2	MG-SW3
Parameter	Units	MECP-GD-TA	MECP-GD-TB	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2015-May-06	2015-Oct-26	2016-Apr-27	2016-Oct-25	2017-May-11	2017-Oct-25	2018-May-09	2018-Oct-24	2019-May-06	2020-May-05	2020-Oct-08	2021-Apr-19	2021-Oct-20	2022-May-04	2023-May-02	2024-May-01	2025-May-05	2015-May-06
						Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions						**Detection Limit**																		
Chloride	mg/L	180	128	-	-	0.1	20	9.38	9.1	14.9	10.4	16.7	17.7	21.8	30.6	26.4	26.2	40.8	30.2	27.2	5.4	24	34	53.2
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	0.32	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<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	<0.05	<0.05	<0.05	<0.01	<0.01	<0.1
Sulphate	mg/L	100	-	-	-	0.1	1.37	0.85	25.2	2.42	8.01	1.34	2.71	0.26	8.52	-	0.29	7.73	0.22	2.99	4.49	9.3	18	54.7
Cations																								
Calcium (tot)	mg/L	-	-	-	-	0.05	29.6	29.9	45.1	27.7	14.5	35.6	24.7	33.9	17.9	18.52	35.31	26.7	44.8	22.3	6.5	22	83	80.9
Magnesium (tot)	mg/L	-	-	-	-	0.05	3.59	4.8	7.67	4.14	1.65	5.11	2.97	4.77	1.82	2.17	5.05	3.16	7.17	3.29	1.11	2.8	13	12.9
Potassium (tot)	mg/L	-	-	-	-	0.05	1.68	2.93	8.69	2.92	0.93	2.59	2	2.44	1.13	1.28	2.33	1.3	2.84	1.46	<0.5	1.3	10	6.82
Sodium (tot)	mg/L	-	-	-	-	0.05	9.85	6.63	10.6	6.63	6.07	6.62	8.55	7.6	14.7	13.88	10.17	19.1	8.54	11.8	6.15	15	20	24.2
Field Parameters																								
pH (Field)	pH units	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.3	7.18	-
Temperature	deg. C	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.6	15.2	-
General Chemistry																								
Alkalinity (as CaCO3)	mg/L	-	-	See Factsheet	-	1	82	94	153	86	39	108	74	89	44	50	94	51	124	56	34	60	200	193
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.04	1.58	0.48	<0.02	0.04	0.81	0.26	<0.02	<0.02	0.03	<0.02	0.27	<0.02	<0.02	<0.05	1.6	0.99
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	48	<5	13	<5	21	<5	<5	<5	<5	<2	<2	7	<2	<2	3	<2	<5
Chemical Oxygen Demand	mg/L	-	-	-	-	4	79	252	23	120	180	282	16	52	17	12	41	12	32	22	19	25	4.1	29
Colour	TCU	-	-	-	-	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	uS/cm	-	-	-	-	1	227	212	353	213	141	232	192	280	198	244	245	266	331	208	94	210	540	640
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	88.7	94.4	144.2	86.2	43	109.9	73.9	104	52.2	55.2	109	79.7	141	69.2	20.8	68	230	255.1
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	6 - 9	-	6.5 - 8.5	-		7.56	7.47	7.9	7.49	7.55	7.65	7.15	7.6	7.03	7.01	7.14	7.24	7.41	6.95	7.16	7.52	7.6	7.75
Phenols	mg/L	0.04	0.004	0.001	-	0.001	<0.001	**0.002**	<0.001	<0.001	<0.001	<0.001	<0.001	**0.003**	**0.002**	<0.001	**0.003**	<0.001	**0.003**	<0.001	<0.001	**0.0023**	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	146	134	208	160	70	166	100	176	120	120	170	156	218	114	74	110	345	376
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	2.93	10.6	2.06	3.92	0.56	9.28	0.76	0.86	0.33	0.38	0.52	0.26	0.78	0.26	0.23	0.28	2.2	1.8
Total Phosphorus	mg/L	-	-	0.03	-	0.01	**0.48**	**1.13**	<0.01	**0.47**	**0.31**	**1.07**	**0.15**	**0.27**	0.03	0.02	**0.04**	<0.02	**0.15**	0.02	<0.02	<0.02	**0.045**	**0.35**
Total Suspended Solids	mg/L	-	-	-	-	10	20	580	14	560	116	536	<10	<10	<10	<10	<10	<10	<10	<10	<10	16	16	81
Turbidity	NTU	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	-	-	-	0.0000305	-	-	-	-	-	<0.000002	<0.00061	0.0081	-
Metals																								
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	0.015	0.057	0.006	<0.005	-
Aluminum (diss, 0.45 µm)	mg/L	-	-	-	Calculated	0.004	-	-	-	-	-	-	-	-	0.013	0.011	0.006	0.006	0.006	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.005	<0.004	0.011	0.01	0.015	0.009	0.008	0.006	-	0.022	0.023	0.018	0.024	-	-	-	-	0.007
Arsenic (tot)	mg/L	-	-	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (tot)	mg/L	2.3	-	-	-	0.002	0.02	0.127	0.043	0.045	0.032	0.063	0.021	0.033	0.017	0.014	0.029	0.017	0.041	0.017	0.01	0.017	0.069	0.098
Beryllium (tot)	mg/L	-	-	Calculated	-	0.01	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001
Boron (tot)	mg/L	3.55	1.5	-	0.2	0.01	<0.01	0.027	0.166	0.026	<0.01	0.019	<0.01	0.012	<0.01	0.016	0.04	<0.01	0.022	0.084	0.018	0.011	0.2	0.218
Cadmium (tot)	mg/L	0.00021	0.000017	-	Calculated	0.00009	<0.0001	0.0001	<0.0001	0.0002	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.0001
Chromium (tot)	mg/L	0.064	-	-	-	0.001	<0.003	<0.003	<0.003	<0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.003
Cobalt (tot)	mg/L	-	-	-	0.0009	0.0005	<0.0005	0.0013	<0.0005	0.0012	0.001	0.0008	<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	0.0069	-	-	Calculated	0.0009	<0.002	0.004	<0.002	<0.002	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.0009	0.0032	<0.002
Iron (tot)	mg/L	1	-	0.3	-	0.01	**0.36**	**11.1**	**6.29**	**2.56**	**1.85**	**2.5**	**0.92**	**1.28**	0.149	0.182	**0.729**	0.1	**1.47**	0.148	0.091	0.21	**3.5**	**2.87**
Lead (tot)	mg/L	0.002	-	-	Calculated	0.0005	<0.001	0.006	<0.001	0.011	0.004	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	0.228	0.502	0.414	0.536	0.621	0.534	0.352	0.56	0.064	0.063	0.285	0.065	0.534	0.008	0.006	0.046	0.51	3.04
Mercury (diss)	mg/L	-	-	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (tot)	mg/L	-	-	-	0.04	0.004	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.002
Nickel (tot)	mg/L	-	-	0.025	-	0.003	<0.003	<0.003	<0.003	<0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.003
Selenium (tot)	mg/L	-	-	0.1	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (tot)	mg/L	-	-	-	-	0.002	3.62	7.84	5.14	8.75	-	-	-	-	-	-	-	-	-	-	-	-	-	6.15
Silver (tot)	mg/L	-	-	0.0001	-	0.0001	<0.0001	**0.0003**	<0.0001	<0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001
Strontium (tot)	mg/L	-	-	-	-	0.01	0.172	0.272	0.253	0.198	-	-	-	-	-	-	-	-	-	-	-	-	-	0.423
Thallium (tot)	mg/L	-	-	-	0.0003	0.0001	<0.0003	<0.0003	<0.0003	<0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0003
Titanium (tot)	mg/L	-	-	-	-	0.003	<0.002	0.004	<0.002	0.006	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003
Vanadium (tot)	mg/L	-	-	-	0.006	0.0005	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.002
Zinc (tot)	mg/L	0.089	0.03	-	0.02	0.001	<0.005	0.043	0.006	0.053	0.017	0.039	0.008	0.007	<0.005	<0.005	<0.005	<0.005	<0.02	<0.02	<0.02	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim

Hastings Highlands Historical Surface Water Analytical Chemistry Results						Location	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3
						Sample ID	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3	MG-SW3
Parameter	Units	MECP-GD-TA	MECP-GD-TB	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2015-Oct-26	2016-Apr-27	2016-Oct-25	2017-May-11	2017-Oct-25	2018-May-09	2018-Oct-24	2019-May-06	2019-Oct-21	2020-May-05	2020-Oct-08	2021-Apr-19	2021-Oct-20	2022-May-04	2023-May-02	2024-May-01	2024-Oct-30	2025-May-05
						Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions						**Detection Limit**																		
Chloride	mg/L	180	128	-	-	0.1	82.7	16	104	14.2	75.7	14.1	74.6	27	66.1	28.4	47	35.3	45.8	28.8	18	25	84	42
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	2.31
Nitrate as N	mg/L	-	-	-	-	0.05	<0.25	0.59	<0.25	0.41	<0.1	<0.05	<0.25	0.19	<0.25	<0.25	<0.05	<0.25	<0.05	0.11	0.72	<0.1	<0.1	2.28
Nitrite as N	mg/L	-	-	-	-	0.01	<0.25	<0.05	<0.25	<0.05	<0.1	<0.05	<0.25	<0.05	<0.25	<0.25	<0.05	<0.25	<0.05	<0.05	<0.05	<0.01	<0.01	0.032
Sulphate	mg/L	100	-	-	-	0.1	15.2	48.2	15	26.6	20.1	7.11	8.8	28.5	10.8	-	9.13	63.5	12	74.7	33.1	11	35	100
Cations																								
Calcium (tot)	mg/L	-	-	-	-	0.05	90.6	61	107	42.8	108	36.5	108	49.4	112	77.21	98.79	97.8	111	91.5	43.2	45	140	150
Magnesium (tot)	mg/L	-	-	-	-	0.05	14.2	9.27	16.2	6.01	20.3	4.69	19.6	6.45	20.2	12.62	19.46	18	24.6	16.2	6.16	6.8	36	23
Potassium (tot)	mg/L	-	-	-	-	0.05	4.32	9.67	4.08	6.34	5.69	4.27	4.11	7.46	4.78	9.28	6.86	8.37	7.94	11.5	4.79	5.1	5.1	12
Sodium (tot)	mg/L	-	-	-	-	0.05	30.2	15.3	34.5	11.9	44.3	8.81	49.2	16.3	56.1	29.68	53	45	70.4	33.6	12	16	76	42
Field Parameters																								
pH (Field)	pH units	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.92	-	7.4
Temperature	deg. C	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.9	-	11.4
General Chemistry																								
Alkalinity (as CaCO3)	mg/L	-	-	See Factsheet	-	1	236	173	285	129	349	122	344	158	405	224	381	296	415	248	182	130	530	400
Ammonia as N	mg/L	-	-	-	-	0.02	0.22	0.79	0.62	0.42	0.11	0.77	0.4	0.55	0.47	<0.02	0.06	<0.02	0.31	<0.02	0.15	<0.05	0.089	0.23
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	8	<5	<5	<5	<5	<5	<5	<5	<2	<2	7	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	68	30	866	19	99	6	34	15	59	25	40	27	55	35	27	23	31	43
Colour	TCU	-	-	-	-	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	uS/cm	-	-	-	-	1	697	454	833	376	781	273	970	405	884	813	768	818	929	702	468	360	1300	1100
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	284.7	190.5	333.9	131.6	353.3	110	350	150	363	245	327	318	378	295	133	150	580	490
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
pH	pH units	6 - 9	-	6.5 - 8.5	-		7.8	8.03	7.66	8.17	7.91	7.61	7.97	7.7	7.72	7.53	8.04	7.84	7.83	7.58	7.8	7.95	8.17	7.84
Phenols	mg/L	0.04	0.004	0.001	-	0.001	**0.003**	<0.001	0.02	<0.001	<0.001	<0.001	**0.002**	**0.002**	0.005	<0.001	**0.003**	**0.004**	0.039	**0.004**	<0.001	**0.0024**	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	396	258	526	190	496	138	532	198	548	390	466	502	524	428	256	195	775	700
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	1.64	1.33	21	0.79	2.15	1.3	1.11	0.8	1.69	0.61	0.72	0.54	1.2	0.68	0.47	0.36	0.55	0.9
Total Phosphorus	mg/L	-	-	0.03	-	0.01	**0.54**	0.01	**3.03**	**0.04**	**0.71**	**0.14**	**0.5**	0.03	**0.62**	**0.04**	**0.2**	**0.04**	**0.32**	0.03	<0.02	<0.02	0.029	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	35	<10	6320	<10	210	<10	37	<10	200	<10	<10	15	54	<10	<10	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	-	-	0.0014197	0.0009054	-	-	-	-	-	0.192	<0.0011	0.0011	0.0015
Metals																								
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004	0.062	<0.005	<0.005	0.007
Aluminum (diss, 0.45 µm)	mg/L	-	-	-	Calculated	0.004	-	-	-	-	-	-	-	0.008	0.007	0.006	0.005	0.005	0.005	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.005	0.007	0.005	0.01	0.006	0.005	0.005	-	-	0.027	0.033	0.103	1.39	-	-	-	-	-
Arsenic (tot)	mg/L	-	-	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (tot)	mg/L	2.3	-	-	-	0.002	0.116	0.043	0.41	0.032	0.122	0.044	0.166	0.047	0.15	0.096	0.103	0.069	0.164	0.11	0.041	0.035	0.12	0.11
Beryllium (tot)	mg/L	-	-	Calculated	-	0.01	<0.001	<0.001	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (tot)	mg/L	3.55	1.5	-	0.2	0.01	0.171	0.305	0.185	0.156	0.257	0.093	0.226	0.186	0.297	0.379	0.496	0.47	0.564	0.559	0.268	0.14	0.79	0.98
Cadmium (tot)	mg/L	0.00021	0.000017	-	Calculated	0.00009	<0.0001	<0.0001	0.0009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0015	<0.0001	<0.00009	<0.00009	<0.00009
Chromium (tot)	mg/L	0.064	-	-	-	0.001	<0.003	<0.003	0.007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt (tot)	mg/L	-	-	-	0.0009	0.0005	0.0006	<0.0005	0.0052	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	0.0069	-	-	Calculated	0.0009	<0.002	<0.002	<0.002	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	0.003	<0.002	0.002	<0.002	<0.001	<0.0009	<0.0009	0.0014
Iron (tot)	mg/L	1	-	0.3	-	0.01	**3.45**	0.28	**21.9**	**0.39**	**3.69**	**0.81**	**2.71**	0.09	**4.73**	**0.537**	**0.96**	0.256	**3.75**	0.109	0.094	0.14	0.17	0.16
Lead (tot)	mg/L	0.002	-	-	Calculated	0.0005	0.002	<0.001	0.021	<0.001	0.002	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.0005	<0.0005	<0.0005
Manganese (tot)	mg/L	-	-	-	-	0.002	2.67	0.098	4.91	0.125	1.6	1.2	3.74	0.221	2.58	0.782	1.18	0.156	1.39	0.1	0.019	0.055	0.49	0.051
Mercury (diss)	mg/L	-	-	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (tot)	mg/L	-	-	-	0.04	0.004	<0.002	<0.002	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (tot)	mg/L	-	-	0.025	-	0.003	<0.003	<0.003	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium (tot)	mg/L	-	-	0.1	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (tot)	mg/L	-	-	-	-	0.002	11	5.31	20.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	-	-	0.0001	-	0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (tot)	mg/L	-	-	-	-	0.01	0.623	0.324	0.809	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (tot)	mg/L	-	-	-	0.0003	0.0001	<0.0003	<0.0003	<0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (tot)	mg/L	-	-	-	-	0.003	0.025	<0.002	0.129	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (tot)	mg/L	-	-	-	0.006	0.0005	<0.002	<0.002	0.021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (tot)	mg/L	0.089	0.03	-	0.02	0.001	0.011	<0.005	0.211	<0.005	0.015	<0.005	<0.005	<0.005	0.014	<0.005	<0.005	<0.005	<0.02	<0.02	<0.02	<0.005	0.0079	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim

Hastings Highlands Historical Surface Water Analytical Chemistry Results						Location	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A
						Sample ID	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4	MG-SW4-QAQC (MG-SW4)	MG-SW4	MG-SW4-QAQC (MG-SW4)	MG-SW4	MG-SW4-QAQC (MG-SW4)	MG-SW4	MG-SW4	MG-QAQC SW-S21 (MG-SW4)	MG-SW4A	MG-SW4A	MG-SW4A-QAQC (MG-SW4A)	MG-SW4A	MG-SW4A
Parameter	Units	MECP-GD-TA	MECP-GD-TB	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2017-Jul-13	2017-Oct-25	2018-May-09	2018-Oct-24	2019-May-06	2019-May-06	2019-Oct-21	2019-Oct-21	2020-May-05	2020-May-05	2020-Oct-08	2021-Apr-19	2021-Apr-19	2020-May-05	2020-Oct-08	2020-Oct-08	2021-Apr-19	2021-Oct-20
						Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions						**Detection Limit**																		
Chloride	mg/L	180	128	-	-	0.1	4.4	4.9	3.49	6.27	4.14	4.13	7.29	7.08	4.3	4.27	6.44	4.64	4.64	5	6.99	6.97	5.08	6.24
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	0.06	<0.05	<0.05	<0.05	0.06	0.06
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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	100	-	-	-	0.1	1.62	2.99	5.12	6.04	5.88	5.86	17.9	17.9	-	-	5.65	6.98	6.98	-	7.01	6.97	7.66	4.9
Cations																								
Calcium (tot)	mg/L	-	-	-	-	0.05	19.2	13.8	8.79	13.3	8.72	8.37	14.7	14.7	10.18	9.77	13.97	11.2	11	10.6	14.94	15.53	11.7	16.8
Magnesium (tot)	mg/L	-	-	-	-	0.05	2.76	2.06	1.2	1.92	1.29	1.26	2.26	2.23	1.51	1.45	1.9	1.76	1.77	1.68	1.99	2.11	1.86	2.43
Potassium (tot)	mg/L	-	-	-	-	0.05	1.11	1.5	1.01	1.3	0.97	0.94	1.65	1.65	1.08	1.08	1.35	1.2	1.16	0.93	1.43	1.52	1.31	1.62
Sodium (tot)	mg/L	-	-	-	-	0.05	2.7	2.86	2.01	2.92	2.41	2.3	3.2	3.11	2.62	2.51	3.33	3.03	2.95	2.94	3.95	4.06	3.29	4.03
Field Parameters																								
pH (Field)	pH units	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature	deg. C	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																								
Alkalinity (as CaCO3)	mg/L	-	-	See Factsheet	-	1	65	43	27	32	23	24	28	27	25	23	36	26	26	25	36	37	29	49
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	0.07	<0.02	<0.02	<0.02	0.11	0.13	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.1
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<2	<2	<2	<5	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	38	16	6	6	9	12	21	13	6	<5	28	12	11	8	24	23	5	19
Colour	TCU	-	-	-	-	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	uS/cm	-	-	-	-	1	140	97	71	115	70	69	119	118	102	100	99	94	93	109	104	104	99	123
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	59.3	42.9	26.9	41.1	27.1	26.1	46	45.9	31.6	30.4	42.7	35.2	34.8	33.4	45.5	47.5	36.9	52
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	6 - 9	-	6.5 - 8.5	-		7.23	7.27	6.65	7.12	6.74	6.91	6.75	7.15	7.12	7.05	6.82	7.25	7.2	7.05	6.79	6.79	7.26	7.46
Phenols	mg/L	0.04	0.004	0.001	-	0.001	**0.002**	<0.001	<0.001	<0.001	<0.001	<0.001	**0.002**	**0.002**	<0.001	<0.001	**0.003**	<0.001	<0.001	<0.001	**0.002**	**0.003**	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	120	80	42	78	52	44	124	118	50	58	76	66	64	58	78	82	76	76
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.64	0.36	0.52	0.36	<0.1	<0.1	0.49	0.49	0.32	0.35	0.46	0.26	0.23	0.33	0.66	0.43	0.3	0.35
Total Phosphorus	mg/L	-	-	0.03	-	0.01	**0.05**	0.02	**0.06**	<0.02	<0.01	<0.01	**0.04**	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	<10	<10	18	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	0.0000026	0.0000026	0.0000445	0.0000526	-	-	-	-	-	-	-	-	-	-
Metals																								
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	-	-	Calculated	0.004	-	-	-	-	0.029	0.03	0.016	0.016	0.026	0.025	0.022	0.028	0.021	0.027	0.024	0.024	0.024	0.021
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.021	0.012	0.025	0.011	-	-	-	-	0.052	0.042	0.116	0.035	0.04	0.091	0.052	0.054	0.114	0.067
Arsenic (tot)	mg/L	-	-	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (tot)	mg/L	2.3	-	-	-	0.002	0.028	0.015	0.011	0.014	0.011	0.011	0.021	0.021	0.011	0.011	0.016	0.011	0.011	0.012	0.015	0.015	0.012	0.017
Beryllium (tot)	mg/L	-	-	Calculated	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (tot)	mg/L	3.55	1.5	-	0.2	0.01	<0.01	0.01	<0.01	0.011	<0.01	<0.01	0.013	0.011	0.012	0.011	0.04	<0.01	<0.01	<0.01	0.029	0.024	<0.01	0.016
Cadmium (tot)	mg/L	0.00021	0.000017	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	0.064	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt (tot)	mg/L	-	-	-	0.0009	0.0005	<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	<0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	0.0069	-	-	Calculated	0.0009	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002
Iron (tot)	mg/L	1	-	0.3	-	0.01	**2.39**	**0.59**	0.19	**0.35**	0.095	0.081	**0.69**	**0.7**	0.254	0.246	**0.767**	0.114	0.186	0.281	**0.371**	**0.385**	0.283	**0.529**
Lead (tot)	mg/L	0.002	-	-	Calculated	0.0005	-	<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	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	0.191	0.038	0.019	0.027	0.01	0.01	0.09	0.09	0.02	0.018	0.048	0.01	0.013	0.02	0.012	0.013	0.019	0.023
Mercury (diss)	mg/L	-	-	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (tot)	mg/L	-	-	-	0.04	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (tot)	mg/L	-	-	0.025	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium (tot)	mg/L	-	-	0.1	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	-	-	0.0001	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (tot)	mg/L	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (tot)	mg/L	-	-	-	0.0003	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (tot)	mg/L	-	-	-	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (tot)	mg/L	-	-	-	0.006	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (tot)	mg/L	0.089	0.03	-	0.02	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.159	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.02

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim

Hastings Highlands Historical Surface Water Analytical Chemistry Results						Location	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A	MG-SW4A
						Sample ID	MG-QAQC SW-F21 (MG-SW4A)	MG-SW4A	MG-QAQC SW-S22 (MG-SW4A)	MG-SW4A	MG-QAQC SW1 F22 (MG-SW4A)	MG-SW4A	MG-QAQC-SW1 (MG-SW4A)	MCG-QAQC-SW1 (MG-SW4A)	MG-SW4A	MG-QAQC-SW1 (MG-SW4A)	MG-SW4A	MG-QAQC-SW1 (MG-SW4A)	MG-SW4A	MG-QAQC-SW1 (MG-SW4A)	MG-SW4A	MG-QAQC-SW1 (MG-SW4A)	MG-SW4A	MG-QAQC-SW1 (MG-SW4A)
Parameter	Units	MECP-GD-TA	MECP-GD-TB	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2021-Oct-20	2022-May-04	2022-May-04	2022-Oct-25	2022-Oct-25	2023-May-02	2023-May-02	2023-May-03	2023-Oct-18	2023-Oct-18	2024-May-01	2024-May-01	2024-Oct-30	2024-Oct-30	2025-May-05	2025-May-05	2025-Oct-16	2025-Oct-16
						Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions						**Detection Limit**																		
Chloride	mg/L	180	128	-	-	0.1	6.24	4.8	4.84	7.48	7.96	3.42	3.37	20.5	5.7	5.6	3.6	2.9	5.6	6.1	4.4	4.1	9.3	8.8
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate as N	mg/L	-	-	-	-	0.05	0.06	0.06	0.06	0.07	0.06	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulphate	mg/L	100	-	-	-	0.1	4.76	6.6	6.66	10.2	10.3	4.96	4.94	3.67	12	12	9	8.1	6.4	6.3	5.5	5.4	2.4	2.4
Cations																								
Calcium (tot)	mg/L	-	-	-	-	0.05	16.3	13	13.2	16.8	16.7	5.03	6.51	4.46	18	18	10	11	16	16	11	11	21	21
Magnesium (tot)	mg/L	-	-	-	-	0.05	2.36	1.95	1.91	2.34	2.53	1.15	0.97	0.73	2.6	2.6	1.5	1.5	2.1	2.2	1.6	1.6	3.4	3.5
Potassium (tot)	mg/L	-	-	-	-	0.05	1.37	<1.15	1.56	1.74	1.62	0.73	0.74	0.67	1.4	1.4	0.93	0.95	1.4	1.4	0.84	0.83	2.1	2.2
Sodium (tot)	mg/L	-	-	-	-	0.05	3.9	3.35	3.37	4.85	4.75	2.51	2.01	13.1	4.1	4.2	3.2	3.1	3.6	3.8	2.8	2.7	4.3	4.4
Field Parameters																								
pH (Field)	pH units	-	-	-	-		-	-	-	-	-	-	-	-	7.79	7.79	6.53	6.53	-	-	6.99	6.99	6.96	6.96
Temperature	deg. C	-	-	-	-		-	-	-	-	-	-	-	-	6.4	6.4	8	8	-	-	11.4	11.4	4.3	4.3
General Chemistry																								
Alkalinity (as CaCO3)	mg/L	-	-	See Factsheet	-	1	45	32	30	40	40	16	16	10	42	44	48	28	44	42	32	32	56	56
Ammonia as N	mg/L	-	-	-	-	0.02	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.052	0.054
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2	2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	20	18	13	<5	<5	31	28	-	15	12	28	21	12	7.2	14	15	21	20
Colour	TCU	-	-	-	-	2.5	-	-	-	-	-	-	-	49.4	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	uS/cm	-	-	-	-	1	122	96	96	140	140	63	63	105	140	140	120	79	120	120	92	91	150	150
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	50.4	40.5	40.8	51.6	52.1	17.3	20.2	14.1	62	59	34	33	56	56	39	39	62	61
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-
pH	pH units	6 - 9	-	6.5 - 8.5	-		7.34	6.98	6.88	7.56	7.61	7.01	6.91	6.84	7.74	7.71	8.32	7.36	7.7	7.68	7.46	7.43	7.31	7.27
Phenols	mg/L	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	<0.001	**0.0012**	0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	66	66	58	110	102	64	56	86	95	105	60	55	110	120	90	100	100	90
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.33	0.35	0.32	0.26	0.36	0.29	0.28	0.21	0.2	0.21	0.44	0.37	0.21	0.2	0.27	0.24	0.48	0.42
Total Phosphorus	mg/L	-	-	0.03	-	0.01	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.063**	**0.05**
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	22	<10
Turbidity	NTU	-	-	-	-	0.5	-	-	-	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002	<0.00052	<0.00052	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061
Metals																								
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004	-	0.027	0.021	-	-	0.034	0.092	0.079	0.01	0.009	0.06	0.06	0.049	0.013	0.033	0.031	0.031	0.03
Aluminum (diss, 0.45 µm)	mg/L	-	-	-	Calculated	0.004	0.021	-	-	0.016	0.013	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.072	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (tot)	mg/L	-	-	-	0.005	0.003	-	-	-	-	-	-	-	<0.003	-	-	-	-	-	-	-	-	-	-
Barium (tot)	mg/L	2.3	-	-	-	0.002	0.015	0.015	0.015	0.016	0.015	0.011	0.012	-	0.016	0.016	0.012	0.012	0.014	0.015	0.012	0.011	0.023	0.022
Beryllium (tot)	mg/L	-	-	Calculated	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (tot)	mg/L	3.55	1.5	-	0.2	0.01	0.012	0.053	0.04	<0.01	<0.01	0.023	0.022	0.012	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	0.014	<0.01	<0.01
Cadmium (tot)	mg/L	0.00021	0.000017	-	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	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Chromium (tot)	mg/L	0.064	-	-	-	0.001	-	-	-	-	-	-	-	<0.003	-	-	-	-	-	-	-	-	-	-
Cobalt (tot)	mg/L	-	-	-	0.0009	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00093	0.0011
Copper (tot)	mg/L	0.0069	-	-	Calculated	0.0009	<0.002	<0.002	<0.002	0.002	<0.001	<0.001	0.004	0.001	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009
Iron (tot)	mg/L	1	-	0.3	-	0.01	**0.573**	0.264	0.265	**0.337**	**0.327**	0.195	0.208	0.243	0.23	0.23	0.23	0.23	**0.33**	**0.35**	0.12	0.12	**3.4**	**2.9**
Lead (tot)	mg/L	0.002	-	-	Calculated	0.0005	<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	<0.0005	<0.0005
Manganese (tot)	mg/L	-	-	-	-	0.002	0.028	0.014	0.017	0.005	0.004	0.005	0.007	0.01	0.005	0.0052	0.0096	0.0096	0.01	0.01	0.0064	0.0061	0.46	0.45
Mercury (diss)	mg/L	-	-	0.0002	-	0.0001	-	-	-	-	-	-	-	<0.0001	-	-	-	-	-	-	-	-	-	-
Molybdenum (tot)	mg/L	-	-	-	0.04	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (tot)	mg/L	-	-	0.025	-	0.003	-	-	-	-	-	-	-	<0.003	-	-	-	-	-	-	-	-	-	-
Selenium (tot)	mg/L	-	-	0.1	-	0.002	-	-	-	-	-	-	-	<0.002	-	-	-	-	-	-	-	-	-	-
Silicon (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	-	-	0.0001	-	0.0001	-	-	-	-	-	-	-	<0.0001	-	-	-	-	-	-	-	-	-	-
Strontium (tot)	mg/L	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (tot)	mg/L	-	-	-	0.0003	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (tot)	mg/L	-	-	-	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (tot)	mg/L	-	-	-	0.006	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (tot)	mg/L	0.089	0.03	-	0.02	0.001	<0.02	<0.02	<0.02	<0.02	<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

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim

Hastings Highlands Historical Surface Water Analytical Chemistry Results						Location	MG-SW5	MG-SW5	MG-SW6	MG-SW6	MG-SW6	MG-SW6	MG-SW6	MG-SW6	MG-SW6	MG-SW6	MG-SW7	MG-SW7	MG-SW7	MG-SW7	MG-SW7	MG-SW7
						Sample ID	MG-SW5	MG-SW5	MG-SW6	MG-SW6	MG-SW6	MG-SW6	MG-SW6	MG-SW6	MG-SW6	MG-SW6	MG-SW7	MG-SW7-QAQC (MG-SW7)	MG-SW7	MG-SW7-QAQC (MG-SW7)	MG-SW7	MG-SW7
Parameter	Units	MECP-GD-TA	MECP-GD-TB	PWQO-GENERAL	PWQO-INTERIM	Sample Date	2018-May-09	2019-May-06	2020-Aug-26	2020-Sep-23	2022-May-04	2022-Oct-25	2023-May-02	2024-May-01	2024-Oct-30	2025-May-05	2020-Aug-26	2020-Aug-26	2020-Sep-23	2020-Sep-23	2025-May-05	2025-Oct-16
						Sample Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions						Detection Limit																
Chloride	mg/L	180	128	-	-	0.1	22	20.7	29.5	31.2	18	33	8.96	16	31	13	3.87	4.01	5.52	5.34	<1	4.5
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	<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	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<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	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
Sulphate	mg/L	100	-	-	-	0.1	7.94	15.3	0.75	0.31	8.51	1.56	11	16	2.7	9.2	8.07	8.07	14.4	14.4	8.3	10
Cations																						
Calcium (tot)	mg/L	-	-	-	-	0.05	19.8	18.6	55.41	47.31	29.3	42.9	18.8	31	51	29	31.59	32.18	25.3	26.37	8.3	34
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.37	1.37	5.13	4.61	3.2	4.7	1.61	3	5.2	2.9	3.35	3.4	2.92	2.97	1	3.8
Potassium (tot)	mg/L	-	-	-	-	0.05	1.12	1.14	2.24	3.01	2.17	4.56	0.95	1.3	4.1	2	1.31	1.44	0.75	0.86	0.36	2.2
Sodium (tot)	mg/L	-	-	-	-	0.05	8.4	9.77	16.63	15.08	11.1	16.5	5.83	9.4	14	8.3	3.29	3.29	3.89	4.13	1.8	3.9
Field Parameters																						
pH (Field)	pH units	-	-	-	-		-	-	-	-	-	-	-	7.14	-	7.4	-	-	-	-	6.49	7.29
Temperature	deg. C	-	-	-	-		-	-	-	-	-	-	-	9.3	-	12.1	-	-	-	-	9.2	5
General Chemistry																						
Alkalinity (as CaCO3)	mg/L	-	-	See Factsheet	-	1	44	37	151	140	76	108	54	73	140	77	89	90	60	67	21	88
Ammonia as N	mg/L	-	-	-	-	0.02	0.12	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.13
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	4	3	<2	7	<2	<2	<2	<2	<2	<2	5	4	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	9	19	25	54	16	<5	28	16	38	15	<5	<5	20	20	10	9
Colour	TCU	-	-	-	-	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	uS/cm	-	-	-	-	1	169	168	376	309	234	313	159	220	370	220	192	191	143	143	67	210
Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	55.1	52.1	159	137	86.3	126	53.6	94	160	93	92.7	94.4	75.2	78.1	28	96
Lab Filtration Aluminum (diss)	unitless	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	6 - 9	-	6.5 - 8.5	-		6.88	7.02	7.06	7.09	7.16	7.63	7.44	7.79	7.66	7.71	6.94	6.97	6.68	6.68	6.98	7.63
Phenols	mg/L	0.04	0.004	0.001	-	0.001	<0.001	**0.002**	**0.003**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.002**	0.001	<0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	80	102	262	222	130	218	98	130	270	155	142	144	116	132	65	145
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.53	<0.1	1	0.89	0.31	0.63	0.32	0.28	0.36	0.29	0.42	0.44	0.69	0.67	0.21	0.38
Total Phosphorus	mg/L	-	-	0.03	-	0.01	**0.07**	0.01	**0.15**	**0.14**	**0.04**	0.03	**0.05**	<0.02	**0.14**	0.025	<0.02	0.02	**0.04**	<0.02	<0.02	**0.05**
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	22	18	<10	185	<10	<10	21	<10	<10	<10	63	27	<10	22
Turbidity	NTU	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	0.000004	-	-	-	<0.000002	<0.000002	<0.00061	<0.00079	<0.00061	-	-	-	-	<0.00061	<0.00061
Metals																						
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004	-	-	-	-	0.006	-	0.046	0.005	<0.005	<0.005	-	-	-	-	0.03	0.006
Aluminum (diss, 0.45 µm)	mg/L	-	-	-	Calculated	0.004	-	0.05	0.013	0.007	-	0.006	-	-	-	-	0.008	0.008	0.016	0.009	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.033	-	0.017	-	-	-	-	-	-	-	0.017	0.042	-	-	-	-
Arsenic (tot)	mg/L	-	-	-	0.005	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium (tot)	mg/L	2.3	-	-	-	0.002	0.022	0.02	0.053	0.037	0.018	0.029	0.015	0.014	0.037	0.016	0.026	0.026	0.026	0.025	0.0063	0.025
Beryllium (tot)	mg/L	-	-	Calculated	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (tot)	mg/L	3.55	1.5	-	0.2	0.01	<0.01	<0.01	0.068	0.035	0.078	0.04	0.027	0.026	0.025	0.031	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	0.00021	0.000017	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009
Chromium (tot)	mg/L	0.064	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt (tot)	mg/L	-	-	-	0.0009	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<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	0.0069	-	-	Calculated	0.0009	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.0009	<0.0009	<0.0009	<0.002	<0.002	<0.002	<0.002	<0.0009	<0.0009
Iron (tot)	mg/L	1	-	0.3	-	0.01	<0.01	<0.01	**0.472**	**0.318**	0.045	0.094	0.077	<0.1	0.29	<0.1	**1.79**	**1.86**	**1.59**	**1.38**	0.11	**3.4**
Lead (tot)	mg/L	0.002	-	-	Calculated	0.0005	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005
Manganese (tot)	mg/L	-	-	-	-	0.002	0.005	0.004	1.35	0.621	0.035	0.412	0.03	0.0035	0.45	0.017	0.14	0.148	0.092	0.075	0.0065	0.22
Mercury (diss)	mg/L	-	-	0.0002	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (tot)	mg/L	-	-	-	0.04	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (tot)	mg/L	-	-	0.025	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium (tot)	mg/L	-	-	0.1	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	-	-	0.0001	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (tot)	mg/L	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (tot)	mg/L	-	-	-	0.0003	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (tot)	mg/L	-	-	-	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (tot)	mg/L	-	-	-	0.006	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (tot)	mg/L	0.089	0.03	-	0.02	0.001	<0.005	0.009	<0.005	0.008	<0.02	<0.02	<0.02	<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 MECP-GD-TA	MECP Guidance Document Table A
Concentration exceeds MECP-GD-TB	MECP Guidance Document Table B
Concentration exceeds PWQO-GENERAL	Provincial Water Quality Objectives General
Concentration exceeds PWQO-INTERIM	Provincial Water Quality Objectives Interim

Appendix F

Trigger Mechanisms and Contingency Plans

MUSCLOW GREENVIEW ROAD WASTE DISPOSAL SITE
TRIGGER MECHANISMS
(AUGUST 2019)

OBJECTIVE AND BACKGROUND

The objective of the trigger mechanisms and contingency plan for the Musclow-Greenview Road Waste Disposal Site (WDS) is to identify the off-site migration of leachate impacted surface water and groundwater, and to prevent and mitigate adverse impacts to the environment.

OBJECTIVE 1: SURFACE WATER IMPACTS

To identify migration of leachate impacted groundwater discharging to adjacent surface water bodies and to identify surface water run-off impacts to surface water bodies and ensure timely action to prevent and mitigate adverse impacts to the environment.

Further investigations at the Site were carried out in 2018 with very little new data obtained with which to re-assess the proposed triggers. The triggers are currently being revised based on the requests by the Technical surface water review (April 10, 2018 and July 16, 2019), the Technical groundwater review (July 26, 2019), and the spring 2019 sampling results.

North Property Boundary-Surface Water

Assessment Points- SW1
Assessment Criteria- Iron, Boron, Lead, Aluminum, Un-ionized Ammonia, and Zinc
Frequency-Sampling twice per year (Spring and Fall)

Contingency Plan is activated if two or more of the following triggers occur: —

- Aluminum exceeds the Provincial Water Quality Objectives (PWQOs) at the assessment point;
- Boron exceeds the PWQOs at the assessment point;
- Iron exceeds the PWQOs at the assessment point:
- Lead exceeds the PWQOs at the assessment point;
- Un-ionized Ammonia exceeds the PWQOs; and
- Zinc exceeds the PWQO at the assessment point;

West Property Boundary-Surface Water

Assessment Points- SW3
Trigger Parameter- Toxicity test (Single Concentration – Acute Lethality) collected from the assessment point.
Frequency-Sampling twice per year (Spring & Fall)

Contingency Plan is activated if test results are greater than 50% mortality and is deemed a "failure" of the test.

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 magna", Environmental Technology Centre, Ottawa, Ontario, Report EPS 1/RM/14 Second Edition - December2000, including February 2016 Amendments.

Table 1 below provides the trigger values for Select Parameters for the comparison of surface water monitoring results.

Table 1: Surface Water Trigger Values for Select Parameters

Parameter	PWQO mg/L
Aluminum	**0.075**
Boron	**0.20**
Iron	**0.30**
Lead	**0.001**
Unionized Ammonia	**0.02**
Zinc	**0.02**

MUSCLOW GREENVIEW ROAD WASTE DISPOSAL SITE
SURFACE WATER CONTINGENCY PLAN

Tier 1: The semi-annual toxicity test results at SW3 will serve as the first sampling event for the Tier 1 Contingency Plan for the SW1 assessment point in addition to the SW3 assessment points. If the semi-annual toxicity tests results fail at SW3, collect a second toxicity sample within two weeks of receiving the results. Upon receipt of two consecutive failing toxicity tests results at SW3 proceed with Tier 2 measures.

Tier 2: In the event of two consecutive toxicity test failures, follow the mitigation/remediation plan for measures to prevent further surface water impacts. Tier 2 of the Contingency Plan (in the event of two consecutive toxicity test failures) and are to include:

1. Benching of the north and west side slopes of the mound is recommended to allow heavy equipment to cover the steep slopes adjacent to the footprint with a minimum of 600 mm of low permeability material to minimize infiltration of precipitation immediately adjacent to the footprint. The placement of this capping material should be monitored to ensure the minimum thickness is met and to ensure the material is placed to a minimum 95% standard proctor density.
    - Should Tier 2 Contingency Plans sampling results continue to result in two failed aquatic test results following the benching and installation of the capping material on the north and west side slopes as described in Item 1 above, then the following mitigation measures are recommended:
        (a) The Municipality should proceed with the development of a Closure Plan for the Site closure prior to reaching the current approved capacity.

- Further remedial efforts to reduced groundwater impacts, or groundwater to surface impacts, may include the following in the future if deemed necessary. These types of systems are very costly and should only be considered if determined to be absolutely necessary.
    - Design and install groundwater purge wells for the south, north, and west sides of Site. Water could be treated on-site and discharged to the wetland or collected and sent off-site for treatment.
        2. The design, approval, and installation of purge wells and treatments systems would likely be over $1,000,000 and would add several thousands of dollars to the Municipality's annual operations and maintenance cost. Thus this option is considered cost prohibitive for the Municipality to operate without provincial or federal government assistance.

OBJECTIVE 2: GROUND WATER IMPACTS TO GROUNDWATER

To identify migration of impacted groundwater downgradient impacts to potential potable groundwater to prevent and mitigate adverse impacts to the environment.

North and West Property Boundary-Groundwater

Assessment Point- Future Assessment Point to be determined if deemed necessary in consultation with the MECP
Trigger Parameters- Alkalinity, Aluminum, Boron, DOC, Iron, Lead, Manganese, TDS, Zinc
Frequency-Sampling twice per year (Spring and Fall)

Contingency Plan is activated if three or more of the following triggers occur: —

- Alkalinity exceeds the Reasonable Use Value (RUV) at the assessment point;
- Aluminum exceeds the RUV at the assessment point;
- Boron exceeds the PWQOs at the assessment point;
- DOC exceeds the RUV at the assessment point;
- Iron exceeds the RUV at the assessment point:
- Lead exceeds the RUV at the assessment point;
- Manganese exceeds the RUV at the assessment point;
- TDS exceeds the RUV; and
- Zinc exceeds the PWQO at the assessment point;

Table 2 below provides trigger criteria for future potential potable monitoring if deemed necessary in consultation with the MECP.

Table 2: Groundwater Trigger Values for Select Parameters

Parameter	RUV (mg/L)
Alkalinity	**314**
Aluminum	**110.9**
Boron	**1.26**
DOC	**18.3**
Iron	**0.16**
Lead	**0.003**
Manganese	**0.003**
TDS	**339**
Zinc	**2.5**

MUSCLOW GREENVIEW ROAD WASTE DISPOSAL SITE
GROUNDWATER CONTINGENCY PLAN

Tier 1: If the triggers are exceeded, a second sample will be collected within two weeks of receiving the laboratory report under standard turnaround submission (typically seven days). If the re-sampling tests results fail, proceed with the Tier 2 measures identified under the Surface Water Contingency Plan.

Musclow Greenview Road Waste Disposal Site
Proposed Trigger Mechanisms
(February 2026)

Objective and Background

The objective of the trigger mechanisms and contingency plan for the Musclow–Greenview Road Waste Disposal Site (WDS) is to identify off-site migration of leachate-impacted surface water and groundwater, and to prevent and mitigate adverse impacts to the environment.

Investigations at the Site were carried out in 2018 through 2025 with new data obtained for reassessment of the proposed triggers. The triggers are currently being revised based on the following:

- Technical surface water review (April 10, 2018, July 16, 2019, and September 24, 2025)
- Technical groundwater review (July 26, 2019)
- MECP Compliance Inspection (October 1, 2025)
- Spring and fall sampling results from 2019 through 2025

Surface Water Impacts

To identify and quantify landfill-related impacts to adjacent surface water, assess magnitude, trend, and ecological significance of impacts, implement early intervention measures where deterioration is observed and provide adaptive management measures proportional to impact severity.

Trigger 1: Surface Water & Groundwater Interaction

Assessment Points: SW3, MG-DP3

Assessment Criteria Parameters:

- Total iron, total boron, total lead, dissolved aluminum, un-ionized ammonia, total zinc

Sampling Frequency: Twice per year (spring and fall) and toxicity testing (spring and fall)

Contingency Plan Activation

Activated if **two or more** of the following triggers occur at assessment point SW3: Aluminum exceeds the Provincial Water Quality Objective (PWQO)

- Boron exceeds the PWQO
- Iron exceeds the PWQO
- Lead exceeds the PWQO
- Un-ionized Ammonia exceeds the PWQO
- Zinc exceeds the PWQO

Trigger 2: Upstream & Downstream Interaction

Assessment Points: SW1 and SW3

Based on the inferred groundwater flow direction of northwest, SW1 appears to be cross-gradient to the Site and would be considered representative of upstream surface water relative to the Site. The background surface water location SW4A is approximately 860 metres northwest of the Site and would not be representative of surface water immediately upgradient of the Site as there is opportunity for other anthropogenic inputs between SW4A and SW1.

Assessment Criteria Parameters:

- Total iron, total boron, total lead, dissolved aluminum, un-ionized ammonia, total zinc

Sampling Frequency: Twice per year (Spring and Fall) and Toxicity testing (Spring and Fall).

Contingency Plan Activation

- Activated if **two or more** trigger parameters have downstream (SW3) concentration ≥ 2x upstream (SW1) concentration

Trigger 3: Western Property Boundary-Surface Water

Assessment Point: SW3

Trigger Parameters - Toxicity Testing (Single Concentration – Acute Lethality)

Contingency Plan Activation

- Greater than 50% mortality and test deemed a “failure”

References:

1. Environment Canada – *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, 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 magna*, EPS 1/RM/14, Second Edition (December 2000, including February 2016 Amendments)

Table 1 below provides the trigger values for Select Parameters for the comparison of surface water monitoring results.

Table 1 – Surface Water Trigger Values

Parameter	PWQO (mg/L)
Aluminum	0.075
Boron	0.20
Iron	0.30
Lead	0.001
Un-ionized Ammonia	0.02
Zinc	0.02

Surface Water Contingency Plan

Tier 1

The semi-annual test results serve as the first sampling event for the Tier 1 Contingency Plan for the SW1, SW3 and MG-DP3 assessment points.

If semi-annual results at SW1 and SW3 show sufficient exceedances, SW3 and MG-DP3 show sufficient interaction or toxicity test results fail at SW3:

- Trigger 1: If SW3 and MG-DP3 show sufficient exceedances, conduct surface water sampling at SW3 and groundwater sampling at MG-DP3 within one month of receiving results. The analysis is to include the full suite of surface water parameters (Schedule 5, Column 3 O.Reg. 232/98) and assess data compared to PWQO/CWQG) to determine if results are consistent with historical data and/or if there appears to be significant potential leachate impacts occurring. Upon receipt of two consecutive trigger exceedances, proceed to Tier 2 measures.

- Trigger 2: If SW1 and SW3 show sufficient exceedances, conduct surface water sampling at SW1and SW3 within one month of receiving results. The analysis is to include the full suite of surface water parameters (Schedule 5, Column 3 O.Reg. 232/98) and assess data compared to PWQO) to determine if results are consistent with historical data and/or if there appears to be significant potential leachate impacts occurring. Upon receipt of two consecutive trigger exceedances, proceed to Tier 2 measures.
- Trigger 3: If toxicity test results fail at SW3, collect a second toxicity sample within 2 weeks of receiving the results. Upon receipt of two consecutive failing toxicity test results at SW3, proceed with Tier 2 measures.

Tier 2

In the event of SW1 and SW3 showing sufficient exceedances, or SW3 and MG-DP3 showing sufficient interaction, or toxicity test results failing at SW3 for two consecutive events, follow the mitigation/remediation plan for measures to prevent further surface water impacts. Tier 2 of the Contingency Plan (in the event of two consecutive toxicity test failures) may include one or more of the following activities:

- Install and sample additional drive-point piezometers along/in the western boundary to determine if, or where groundwater is discharging to the west.
- Investigate additional surface water sampling locations to be collected during rainfall events. Additional surface water data could assist to clarify the connection between the landfill and off-site areas.
- Complete a full groundwater and surface water assessment for the Site to allow for more data collection, and to identify for which leachate indicator parameters should be monitored, at what frequency, and the length of time monitoring should be conducted.

Tier 3

Should Tier 2 Contingency Plans sampling results continue to result in SW1 and SW3 exceedances, SW3 and MG-DP3 interaction or two failed toxicity aquatic test results, then the following mitigation measures should be evaluated: add the benching from previous

- Design and install groundwater purge wells for the north, south, and west sides of the Site. Water could be treated on-site and discharged to the wetland or collected and sent off-site for treatment. This option is expensive and may be cost prohibitive for the Municipality to operate without provincial or federal government assistance.
- Benching of the north and west side slopes of the mound to allow heavy equipment to cover the steep slopes adjacent to the footprint with a minimum of 600 mm of low permeability

material to minimize infiltration of precipitation immediately adjacent to the footprint. The placement of this capping material should be monitored to ensure the minimum thickness is met and material is placed to a minimum 95% standard proctor density.

- Should Tier 3 Contingency Plans sampling results continue to result in two failed aquatic test results following the benching and installation of the capping material as described above, then development of a Closure Plan should be considered and the Site closed prior to reaching the current approved capacity.

Groundwater Impacts

To identify migration of impacted groundwater downgradient to potential potable groundwater and prevent/mitigate adverse impacts.

However, current site understanding indicates that groundwater discharges to surface water prior to reaching the property boundary; therefore, the intent of Guideline B-7 is satisfied without the need for a Trigger Mechanism and Contingency Plan for groundwater at this time.

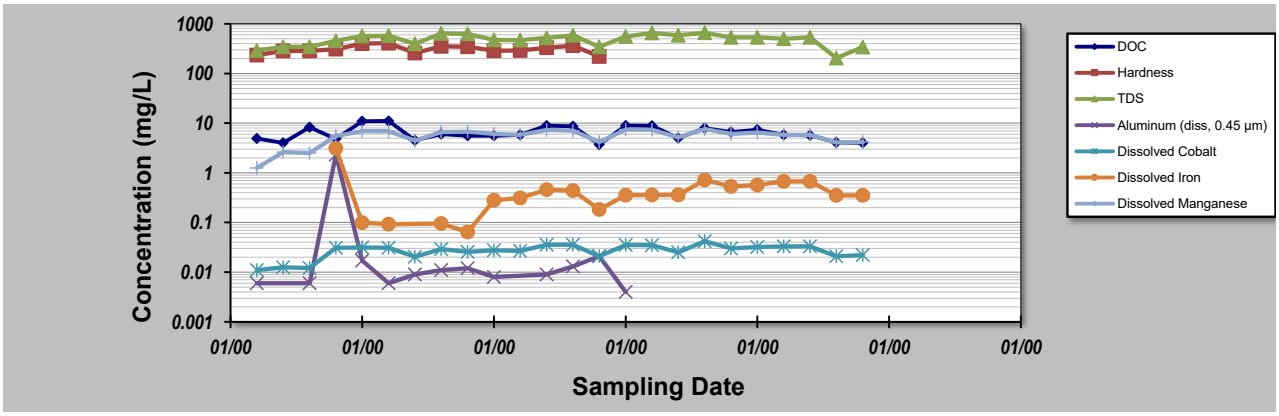
Appendix G

Mann-Kendall Analysis

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-18-1
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	DOC	Hardness	TDS	hinum (diss, 0.45	Dissolved Cobalt	Dissolved Iron	ssolved Manganese
Sampling Event	Sampling Date	MG-18-1 CONCENTRATION (mg/L)						
1	2019-Jan-10	4.9	234.5	290	0.006	0.011	<0.01	1.25
2	2019-May-06	4	283.9	344	<0.004	0.0125	<0.01	2.6
3	2019-May-06	8.3	283.9	344	0.006	0.0121	<0.01	2.51
4	2019-Oct-21	4.8	309	456	2.33	0.031	3.11	5.53
5	2020-May-05	10.9	401	570	0.017	0.0313	0.099	6.94
6	2020-May-05	11.1	408.8	574	0.006	0.0312	0.092	6.92
7	2020-Oct-08	4.5	257	394	0.009	0.0204	<0.01	4.47
8	2021-Apr-19	6	350.7	642	0.011	0.0291	0.095	6.62
9	2021-Apr-19	5.6	343.6	628	0.012	0.0256	0.064	6.77
10	2021-Oct-20	5.6	287.5	474	0.008	0.0275	0.28	6.08
11	2021-Oct-20	5.8	289.3	468	<0.004	0.0266	0.311	5.82
12	2022-May-04	8.9	330.5	524	0.009	0.0358	0.458	7.26
13	2022-May-04	8.6	361.9	590	0.013	0.0356	0.441	7.08
14	2022-Oct-25	3.7	221.1	346	0.021	0.0208	0.182	4.19
15	2023-May-02	8.9	-	558	0.004	0.0354	0.354	7.46
16	2023-May-02	8.8	-	656	<0.004	0.0348	0.357	7.33
17	2023-Oct-18	5	-	590	<0.0049	0.025	0.36	5.2
18	2024-May-01	7.9	-	660	<0.0049	0.042	0.72	7.6
19	2024-Oct-30	6.6	-	535	<0.0049	0.03	0.53	6.1
20	2024-Oct-30	7.4	-	535	<0.0049	0.032	0.57	6.5
21	2025-May-05	5.8	-	500	<0.0049	0.033	0.67	5.8
22	2025-May-05	5.7	-	535	<0.0049	0.033	0.67	5.8
23	2025-Oct-16	4.1	-	205	<0.0049	0.021	0.35	4.1
24	2025-Oct-16	4	-	340	<0.0049	0.022	0.35	4.2
25								
Coefficient of Variation:		0.33	0.18	0.26	3.41	0.29	1.28	0.31
Mann-Kendall Statistic (S):		-20	12	33	8	67	70	31
Confidence Factor:		68.0%	72.3%	78.4%	66.2%	94.9%	98.8%	77.0%
Concentration Trend:		Stable	No Trend	No Trend	No Trend	Prob. Increasing	Increasing	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.

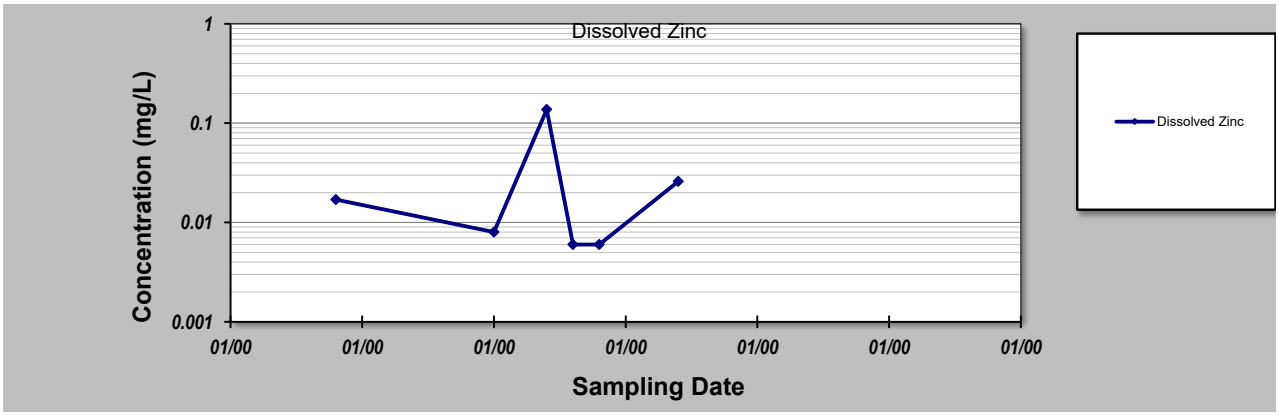
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-18-1
Conducted By:	Oscar Fisher	Concentration Units:	mg/L
Sampling Point ID:	Dissolved Zinc		

Sampling Event	Sampling Date	MG-18-1 CONCENTRATION (mg/L)
1	2019-Jan-10	<0.005
2	2019-May-06	<0.005
3	2019-May-06	<0.005
4	2019-Oct-21	0.017
5	2020-May-05	<0.005
6	2020-May-05	<0.005
7	2020-Oct-08	<0.005
8	2021-Apr-19	<0.005
9	2021-Apr-19	<0.005
10	2021-Oct-20	0.008
11	2021-Oct-20	<0.005
12	2022-May-04	0.137
13	2022-May-04	0.006
14	2022-Oct-25	0.006
15	2023-May-02	<0.005
16	2023-May-02	<0.005
17	2023-Oct-18	0.026
18	2024-May-01	<0.005
19	2024-Oct-30	<0.005
20	2024-Oct-30	<0.005
21	2025-May-05	<0.005
22	2025-May-05	<0.005
23	2025-Oct-16	<0.005
24	2025-Oct-16	<0.005
25		
Coefficient of Variation:		1.54
Mann-Kendall Statistic (S):		-2
Confidence Factor:		57.0%
Concentration 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.

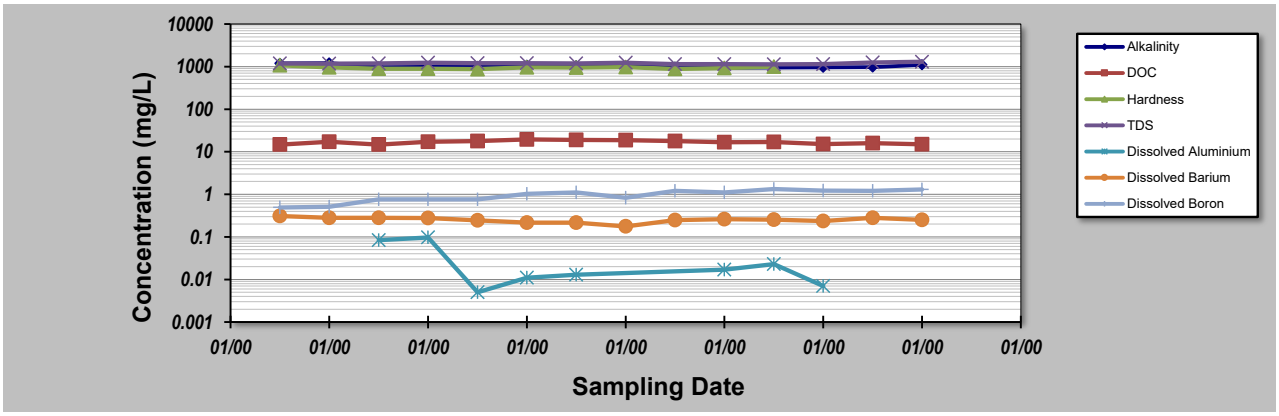
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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 Environmental Inc., www.gsi-net.com

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-18-2
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Alkalinity	DOC	Hardness	TDS	ssolved Aluminiı	Dissolved Bariun	Dissolved Boron
Sampling Event	Sampling Date	MG-18-2 CONCENTRATION (mg/L)						
1	2019-Jan-10	1190	14.7	1073.5	1190	<0.004	0.309	0.49
2	2019-May-06	1210	17.1	958.1	1170	<0.004	0.28	0.509
3	2019-Oct-21	978	14.7	888.7	1190	0.084	0.28	0.761
4	2019-Oct-21	983	17.2	895.8	1240	0.097	0.278	0.76
5	2020-May-05	1010	17.8	873.9	1200	0.005	0.245	0.762
6	2020-Oct-08	1070	19.5	959.4	1200	0.011	0.217	1.03
7	2020-Oct-08	1050	18.9	953.6	1190	0.013	0.217	1.11
8	2021-Apr-19	1020	18.7	973	1240	<0.004	0.176	0.833
9	2021-Oct-20	976	17.9	881	1140	<0.004	0.248	1.21
10	2022-May-04	940	16.8	925.8	1140	0.017	0.261	1.11
11	2022-Oct-25	954	16.9	993.5	1130	0.023	0.253	1.33
12	2023-May-02	963	15.2	-	1150	0.007	0.237	1.22
13	2023-Oct-18	970	16	-	1250	<0.0049	0.28	1.2
14	1/May/24	1100	15	-	1300	<0.0049	0.25	1.3
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.08	0.09	0.06	0.04	1.14	0.13	0.29
Mann-Kendall Statistic (S):		-31	-10	1	5	-4	-23	72
Confidence Factor:		95.0%	68.6%	50.0%	58.5%	64.0%	88.3%	>99.9%
Concentration Trend:		Prob. Decreasing	Stable	No Trend	No Trend	No Trend	Stable	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.

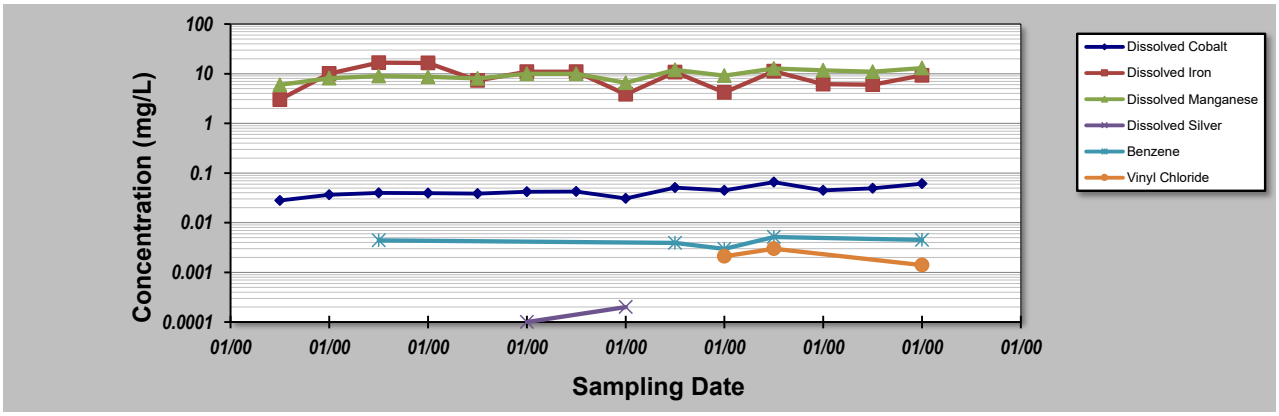
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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 Environmental Inc., www.gsi-net.com

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-18-2
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Dissolved Cobalt	Dissolved Iron	Dissolved Manganese	Dissolved Silver	Benzene	Vinyl Chloride	
Sampling Event	Sampling Date	MG-18-2 CONCENTRATION (mg/L)						
1	2019-Jan-10	0.028	3.02	5.97	<0.002	-	-	
2	2019-May-06	0.0364	10.1	8.15	<0.0001	-	-	
3	2019-Oct-21	0.0399	16.7	8.92	<0.0001	0.0044	<0.00068	
4	2019-Oct-21	0.0392	16.5	8.69	<0.0001	-	-	
5	2020-May-05	0.0387	7.29	8.08	<0.0001	-	-	
6	2020-Oct-08	0.0421	11	9.96	0.0001	<0.0008	<0.00068	
7	2020-Oct-08	0.0424	10.9	9.93	<0.0001	-	-	
8	2021-Apr-19	0.0307	3.85	6.57	0.0002	-	-	
9	2021-Oct-20	0.0508	10.7	11.9	<0.0001	0.0039	<0.00068	
10	2022-May-04	0.0446	4.2	9.18	<0.0001	0.00297	0.00211	
11	2022-Oct-25	0.0654	11.2	12.7	<0.0001	0.00515	0.00299	
12	2023-May-02	0.0449	6.15	11.7	<0.0001	-	-	
13	2023-Oct-18	0.049	6	11	<0.00009	-	-	
14	1/May/24	0.061	9.2	13	<0.00009	0.0045	0.0014	
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.24	0.47	0.22	0.47	0.19	0.37	
Mann-Kendall Statistic (S):		61	-13	53	1	2	-1	
Confidence Factor:		>99.9%	74.1%	99.8%		59.2%		
Concentration Trend:		Increasing	Stable	Increasing		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.

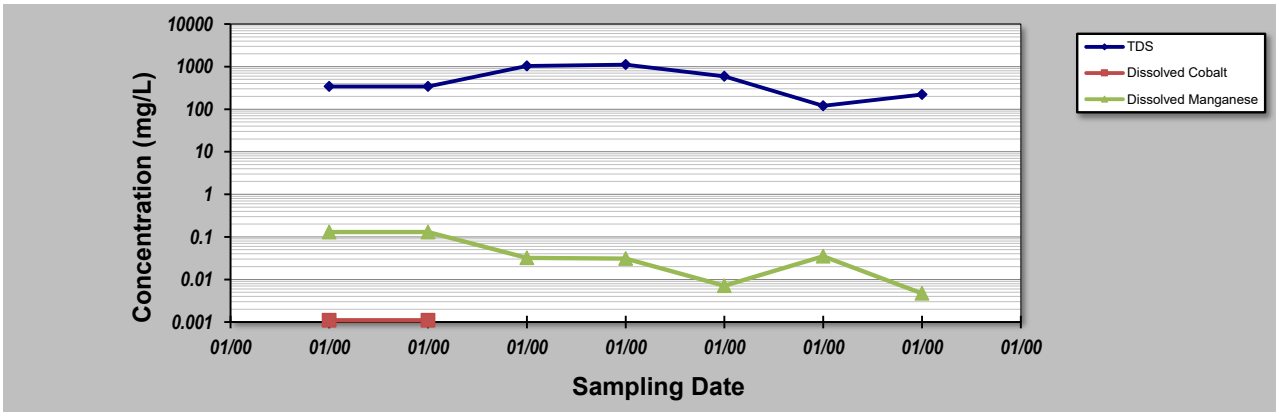
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-18-3R
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID: TDS | Dissolved Cobalt | Dissolved Manganese

Sampling Event	Sampling Date	MG-18-3R CONCENTRATION (mg/L)						
1	2023-Oct-18	340	0.0011	0.13				
2	2023-Oct-18	340	0.0011	0.13				
3	2024-May-01	1040	<0.0005	0.032				
4	2024-May-01	1110	<0.0005	0.031				
5	2024-Oct-30	590	<0.0005	0.0071				
6	2025-May-05	120	<0.0005	0.035				
7	2025-Oct-16	220	<0.0005	0.0047				
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.74	0.00	1.02				
Mann-Kendall Statistic (S):		-4	0	-14				
Confidence Factor:		66.7%		97.5%				
Concentration Trend:		Stable		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.

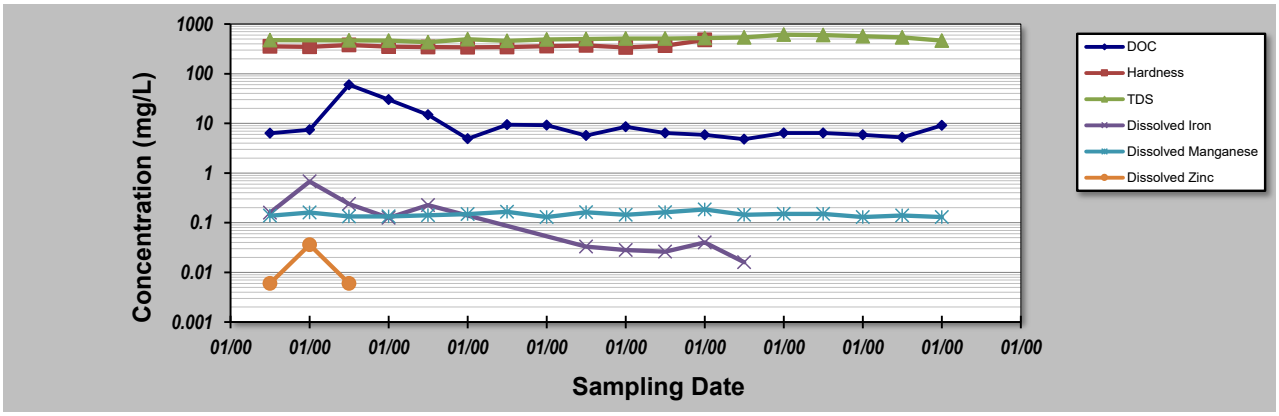
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-DP1
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	DOC	Hardness	TDS	Dissolved Iron	solved Mangan	Dissolved Zinc	

Sampling Event	Sampling Date	MG-DP1 CONCENTRATION (mg/L)						
1	2016-Oct-25	6.3	353.6	472	0.158	0.138	0.006	
2	2017-May-11	7.4	347.6	-	0.675	0.161	0.036	
3	2017-Oct-25	59.9	379.9	466	0.239	0.134	0.006	
4	2018-May-09	30	352.5	462	0.125	0.134	<0.005	
5	2019-May-06	14.8	342.7	432	0.226	0.141	<0.005	
6	2019-Oct-21	4.9	339.3	492	<0.01	0.149	<0.005	
7	2020-May-05	9.4	343.4	460	<0.01	0.166	<0.005	
8	2020-Oct-08	9.2	358.9	490	<0.01	0.13	<0.005	
9	2021-Apr-19	5.7	370.3	498	0.033	0.163	<0.005	
10	2021-Oct-20	8.5	338.1	508	0.028	0.144	<0.005	
11	2022-May-04	6.4	368.3	508	0.026	0.163	<0.005	
12	2022-Oct-25	5.9	478.9	522	0.04	0.185	<0.005	
13	2023-May-02	4.8	-	540	0.016	0.144	<0.005	
14	2023-Oct-18	6.4	-	610	<0.1	0.15	<0.005	
15	2024-May-01	6.4	-	600	<0.1	0.15	<0.005	
16	2024-Oct-30	5.9	-	565	<0.1	0.13	<0.005	
17	2025-May-05	5.2	-	540	<0.1	0.14	<0.005	
18	2025-Oct-16	9.1	-	465	<0.1	0.13	<0.005	
19								
20								
Coefficient of Variation:		1.17	0.11	0.10	1.28	0.10	1.08	
Mann-Kendall Statistic (S):		-49	8	74	-31	-4	0	
Confidence Factor:		96.6%	68.1%	99.9%	99.8%	54.5%		
Concentration Trend:		Decreasing	No Trend	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.

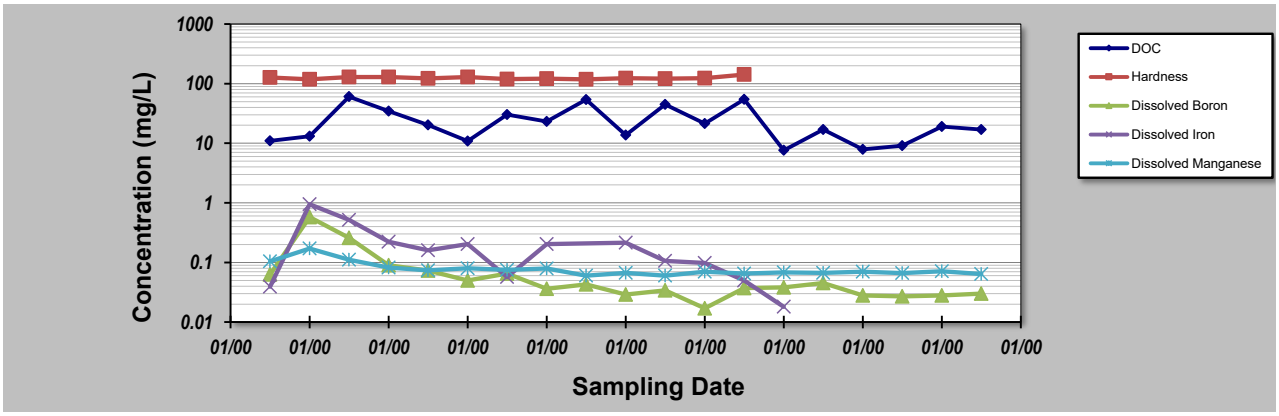
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-DP2
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	DOC	Hardness	Dissolved Boron	Dissolved Iron	solved Manganese		

Sampling Event	Sampling Date	MG-DP2 CONCENTRATION (mg/L)						
1	2016-Oct-25	11	126.9	0.063	0.039	0.104		
2	2017-May-11	13.1	118.2	0.576	0.946	0.171		
3	2017-Oct-25	60.4	129.2	0.258	0.518	0.111		
4	2018-May-09	34.5	129.2	0.09	0.223	0.082		
5	2018-Oct-24	20.2	122.6	0.073	0.16	0.074		
6	2019-May-06	10.9	129.3	0.05	0.204	0.08		
7	2019-Oct-21	30.2	119.2	0.065	0.057	0.075		
8	2020-May-05	23.1	121.8	0.036	0.204	0.079		
9	2020-Oct-08	53.9	118	0.043	<0.01	0.06		
10	2021-Apr-19	13.7	123.4	0.029	0.215	0.067		
11	2021-Oct-20	44.7	120.8	0.034	0.106	0.06		
12	2022-May-04	21.3	123.9	0.017	0.098	0.07		
13	2022-Oct-25	54.2	142	0.037	0.05	0.065		
14	2023-May-02	7.6	-	0.038	0.018	0.068		
15	2023-Oct-18	17	-	0.045	<0.1	0.067		
16	2024-May-01	7.9	-	0.028	<0.1	0.07		
17	2024-Oct-30	9.1	-	0.027	<0.1	0.066		
18	2025-May-05	19	-	0.028	<0.1	0.071		
19	2025-Oct-16	17	-	0.03	<0.1	0.064		
20								
Coefficient of Variation:		0.69	0.05	1.58	1.17	0.33		
Mann-Kendall Statistic (S):		-26	3	-104	-37	-90		
Confidence Factor:		80.7%	54.8%	>99.9%	98.7%	99.9%		
Concentration Trend:		Stable	No Trend	Decreasing	Decreasing	Decreasing		



Notes:

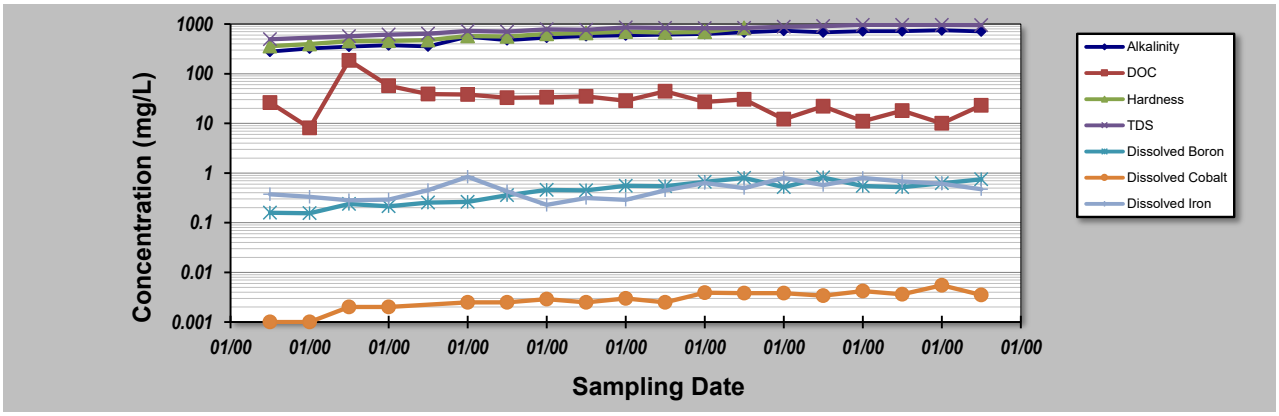
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-DP3
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Alkalinity	DOC	Hardness	TDS	Dissolved Boron	Dissolved Cobalt	Dissolved Iron
Sampling Event	Sampling Date	MG-DP3 CONCENTRATION (mg/L)					
1	2016-Oct-25	279	26.3	358.6	494	0.158	0.001	0.372
2	2017-May-11	323	8.1	393.8	-	0.155	0.001	0.333
3	2017-Oct-25	352	185	454.1	570	0.239	0.002	0.284
4	2018-May-09	373	56.9	460.7	610	0.214	0.002	0.291
5	2018-Oct-24	353	39	472.8	636	0.254	<0.002	0.453
6	2019-May-06	558	38.2	576.6	728	0.261	0.0025	0.84
7	2019-Oct-21	474	32.6	561.1	702	0.359	0.0025	0.428
8	2020-May-05	530	33.6	632.3	782	0.459	0.0029	0.229
9	2020-Oct-08	575	34.8	659	768	0.447	0.0025	0.314
10	2021-Apr-19	593	28.6	705.4	850	0.551	0.003	0.288
11	2021-Oct-20	614	44.2	672.2	832	0.541	0.0025	0.448
12	2022-May-04	631	27.1	695.4	822	0.664	0.0039	0.628
13	2022-Oct-25	678	30.4	834.6	834	0.8	0.0038	0.498
14	2023-May-02	736	12.2	-	882	0.52	0.0038	0.796
15	2023-Oct-18	680	22	-	910	0.81	0.0034	0.57
16	2024-May-01	720	11	-	960	0.55	0.0042	0.8
17	2024-Oct-30	720	18	-	955	0.52	0.0036	0.68
18	2025-May-05	750	10	-	955	0.62	0.0055	0.61
19	2025-Oct-16	710	23	-	945	0.75	0.0035	0.47
20								
Coefficient of Variation:		0.28	1.07	0.24	0.18	0.45	0.38	0.39
Mann-Kendall Statistic (S):		150	-77	72	130	124	108	67
Confidence Factor:		>99.9%	99.7%	>99.9%	>99.9%	>99.9%	>99.9%	99.0%
Concentration Trend:		Increasing	Decreasing	Increasing	Increasing	Increasing	Increasing	Increasing



Notes:

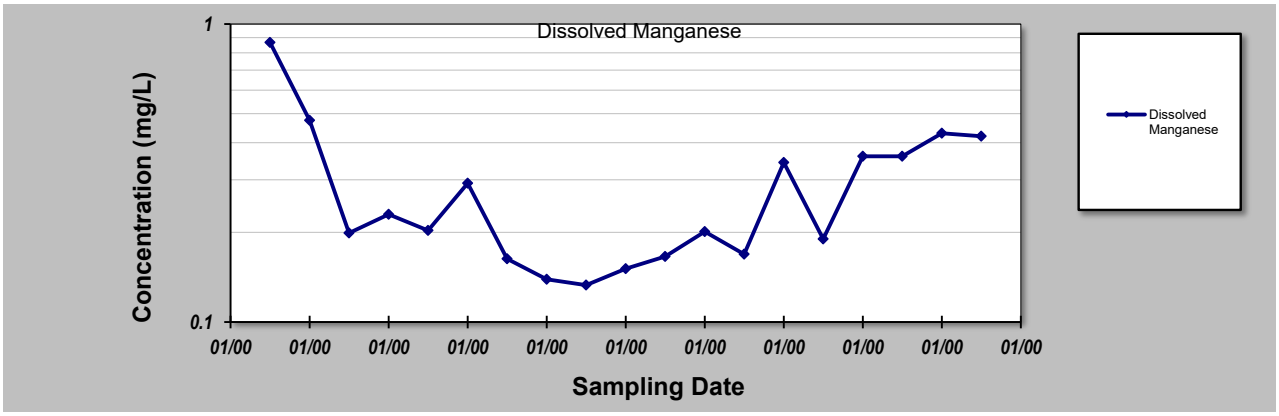
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-DP3
Conducted By:	Oscar Fisher	Concentration Units:	mg/L
Sampling Point ID:	ssolved Manganese		

Sampling Event	Sampling Date	MG-DP3 CONCENTRATION (mg/L)						
1	2016-Oct-25	0.867						
2	2017-May-11	0.475						
3	2017-Oct-25	0.199						
4	2018-May-09	0.23						
5	2018-Oct-24	0.203						
6	2019-May-06	0.292						
7	2019-Oct-21	0.163						
8	2020-May-05	0.139						
9	2020-Oct-08	0.133						
10	2021-Apr-19	0.151						
11	2021-Oct-20	0.166						
12	2022-May-04	0.201						
13	2022-Oct-25	0.169						
14	2023-May-02	0.343						
15	2023-Oct-18	0.19						
16	2024-May-01	0.36						
17	2024-Oct-30	0.36						
18	2025-May-05	0.43						
19	2025-Oct-16	0.42						
20								
Coefficient of Variation:		0.61						
Mann-Kendall Statistic (S):		20						
Confidence Factor:		74.4%						
Concentration 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.

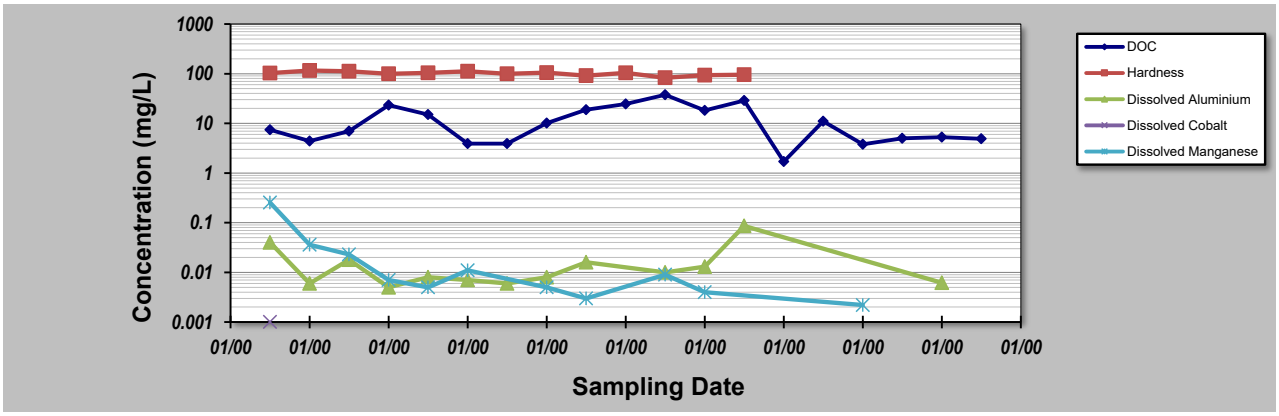
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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 Environmental Inc., www.gsi-net.com

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-DP4
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	DOC	Hardness	ssolved Aluminiu	Dissolved Cobalt	solved Manganese		
Sampling Event	Sampling Date	MG-DP4 CONCENTRATION (mg/L)						
1	2016-Oct-25	7.4	102.8	0.04	0.001	0.254		
2	2017-May-11	4.4	115.8	0.006	<0.001	0.036		
3	2017-Oct-25	7	111.5	0.018	<0.001	0.023		
4	2018-May-09	23.3	99.2	0.005	<0.001	0.007		
5	2018-Oct-24	15	103.7	0.008	<0.001	0.005		
6	2019-May-06	3.9	112.4	0.007	<0.0005	0.011		
7	2019-Oct-21	3.9	99.2	0.006	<0.0005	<0.002		
8	2020-May-05	10.1	104.7	0.008	<0.0005	0.005		
9	2020-Oct-08	18.9	91.2	0.016	<0.0005	0.003		
10	2021-Apr-19	24.5	103.9	<0.004	<0.0005	<0.002		
11	2021-Oct-20	37.6	82.8	0.01	<0.0005	0.009		
12	2022-May-04	18.3	93	0.013	<0.0005	0.004		
13	2022-Oct-25	28.8	95.1	0.086	<0.0005	<0.002		
14	2023-May-02	1.7	-	<0.004	<0.0005	<0.002		
15	2023-Oct-18	11	-	<0.0049	<0.0005	<0.002		
16	2024-May-01	3.8	-	<0.0049	<0.0005	0.0022		
17	2024-Oct-30	5	-	<0.0049	<0.0005	<0.002		
18	2025-May-05	5.3	-	0.0062	<0.0005	<0.002		
19	2025-Oct-16	4.9	-	<0.0049	<0.0005	<0.002		
20								
Coefficient of Variation:		0.83	0.09	1.28		2.27		
Mann-Kendall Statistic (S):		-10	-33	10		-40		
Confidence Factor:		62.2%	97.5%	70.5%		100.0%		
Concentration Trend:		Stable	Decreasing	No Trend		Decreasing		



Notes:

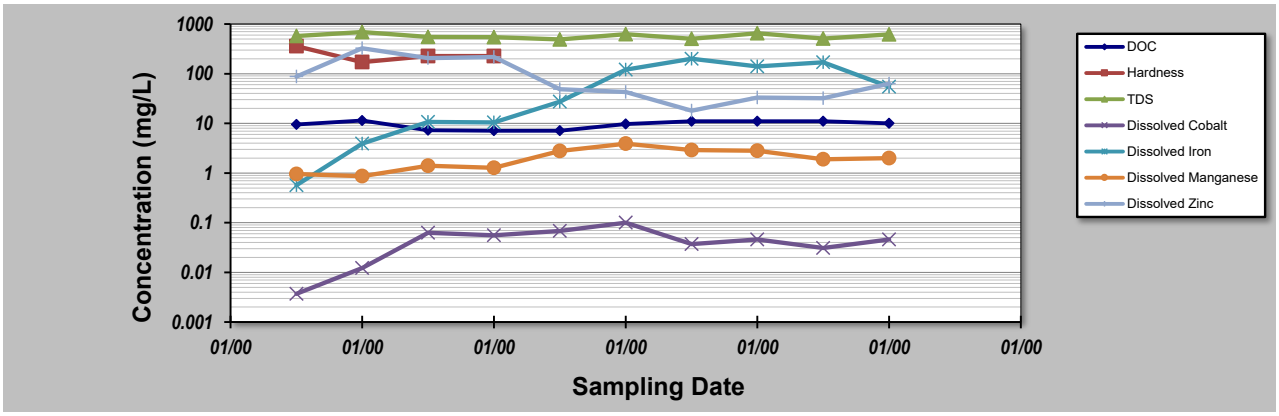
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-DP5
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	DOC	Hardness	TDS	Dissolved Cobalt	Dissolved Iron	Dissolved Manganese	Dissolved Zinc
Sampling Event	Sampling Date	MG-DP5 CONCENTRATION (mg/L)						
1	2021-Oct-20	9.5	359.1	572	0.0037	0.568	0.95	87.9
2	2022-May-04	11.4	171.1	690	0.0122	3.9	0.864	325
3	2022-Oct-25	7.3	226.7	548	0.0627	10.7	1.41	206
4	2022-Oct-25	7.1	227.6	546	0.0557	10.4	1.27	218
5	2023-May-02	7.1	-	490	0.068	27.3	2.79	48.7
6	2023-Oct-18	9.7	-	625	0.1	120	3.9	43
7	2024-May-01	11	-	505	0.037	200	2.9	18
8	2024-Oct-30	11	-	655	0.046	140	2.8	33
9	2025-May-05	11	-	510	0.031	170	1.9	32
10	2025-Oct-16	10	-	620	0.046	55	2	63
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.18	0.32	0.12	0.60	1.03	0.48	0.97
Mann-Kendall Statistic (S):		9	0	-5	6	31	19	-23
Confidence Factor:		75.8%	37.5%	63.6%	66.8%	99.8%	94.6%	97.7%
Concentration Trend:		No Trend	Stable	Stable	No Trend	Increasing	Prob. Increasing	Decreasing



Notes:

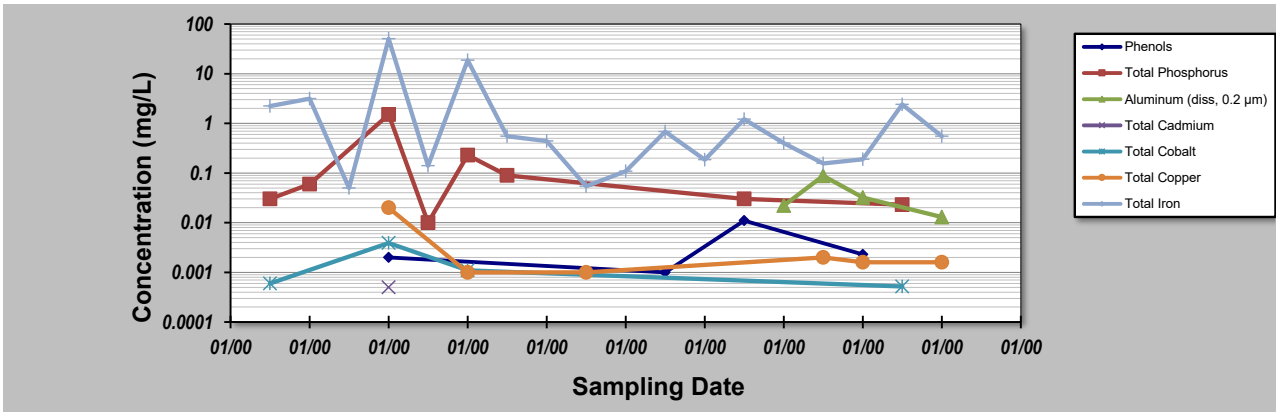
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-SW1
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Phenols	Total Phosphorus	Aluminum (diss, 0.2	Total Cadmium	Total Cobalt	Total Copper	Total Iron
Sampling Event	Sampling Date	MG-SW1 CONCENTRATION (mg/L)						
1	2015-May-06	<0.001	0.03	-	<0.0001	0.0006	<0.002	2.24
2	2015-Oct-26	<0.001	0.06	-	<0.0001	<0.0005	<0.002	3.13
3	2016-Apr-27	<0.001	<0.01	-	<0.0001	<0.0005	<0.002	0.05
4	2016-Oct-25	0.002	1.5	-	0.0005	0.0039	0.02	50.4
5	2017-May-11	<0.001	0.01	-	<0.0001	<0.0005	<0.002	0.14
6	2017-Oct-25	<0.001	0.23	-	<0.0001	0.0011	0.001	18.7
7	2018-May-09	<0.001	0.09	-	<0.0001	<0.0005	<0.001	0.55
8	2018-Oct-24	<0.001	<0.02	-	<0.0001	<0.0005	<0.001	0.44
9	2019-May-06	<0.001	<0.01	-	<0.0001	<0.0005	0.001	0.054
10	2020-May-05	<0.001	<0.02	-	<0.0001	<0.0005	<0.002	0.109
11	2020-Oct-08	0.001	<0.02	-	<0.0001	<0.0005	<0.002	0.679
12	2021-Apr-19	<0.001	<0.02	-	<0.0001	<0.0005	<0.002	0.186
13	2021-Oct-20	0.011	0.03	-	<0.0001	<0.0005	<0.002	1.22
14	2022-May-04	<0.001	<0.02	0.022	<0.0001	<0.0005	<0.002	0.398
15	2023-May-02	<0.001	<0.02	0.088	<0.0001	<0.0005	0.002	0.156
16	2024-May-01	0.0023	<0.02	0.032	<0.00009	<0.0005	0.0016	0.19
17	2024-Oct-30	<0.001	0.023	<0.005	<0.00009	0.00052	<0.0009	2.4
18	2025-May-05	<0.001	<0.02	0.013	<0.00009	<0.0005	0.0016	0.55
19								
20								
Coefficient of Variation:		1.14	2.07	0.87		1.05	1.67	2.70
Mann-Kendall Statistic (S):		2	-5	-2		-2	-1	-10
Confidence Factor:		62.5%	68.3%	62.5%		62.5%	50.0%	63.2%
Concentration Trend:		No Trend	No Trend	Stable		No Trend	No Trend	No Trend



Notes:

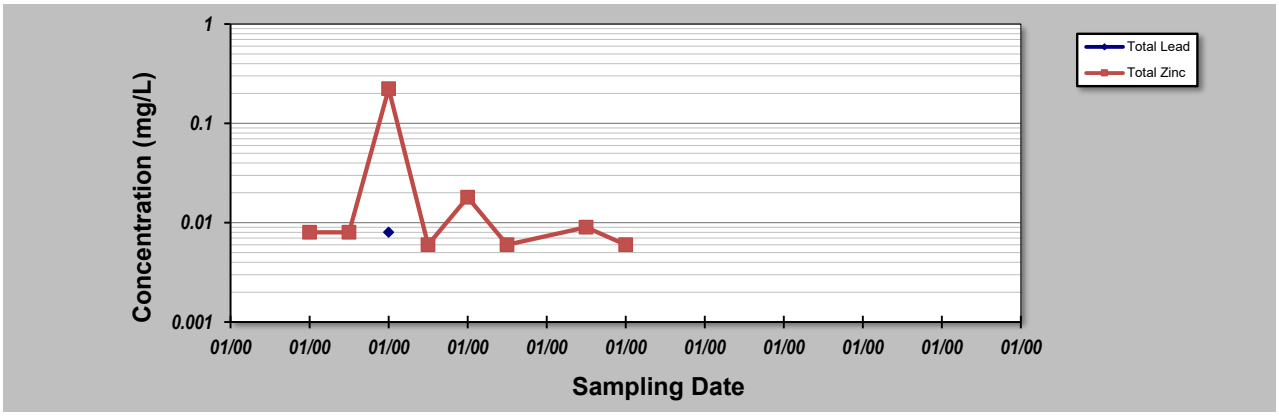
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-SW1
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Total Lead	Total Zinc					
Sampling Event	Sampling Date	MG-SW1 CONCENTRATION (mg/L)					
1	2015-May-06	<0.001	<0.005				
2	2015-Oct-26	<0.001	0.008				
3	2016-Apr-27	<0.001	0.008				
4	2016-Oct-25	0.008	0.223				
5	2017-May-11	<0.001	0.006				
6	2017-Oct-25	<0.001	0.018				
7	2018-May-09	<0.001	0.006				
8	2018-Oct-24	<0.001	<0.005				
9	2019-May-06	<0.001	0.009				
10	2020-May-05	<0.001	0.006				
11	2020-Oct-08	<0.001	<0.005				
12	2021-Apr-19	<0.001	<0.005				
13	2021-Oct-20	<0.001	<0.02				
14	2022-May-04	<0.001	<0.02				
15	2023-May-02	<0.001	<0.02				
16	2024-May-01	<0.0005	<0.005				
17	2024-Oct-30	<0.0005	<0.005				
18	2025-May-05	<0.0005	<0.005				
19							
20							
Coefficient of Variation:			2.14				
Mann-Kendall Statistic (S):			-6				
Confidence Factor:			72.6%				
Concentration Trend:			No Trend				



Notes:

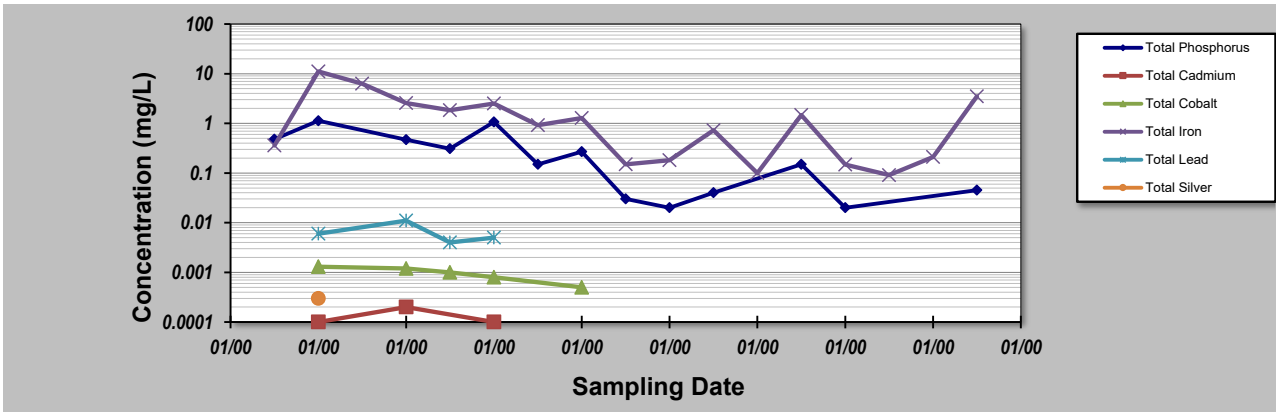
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-SW2
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Phenols	otal Phosphoru	Total Cadmium	Total Cobalt	Total Iron	Total Lead	Total Silver
Sampling Event	Sampling Date	MG-SW2 CONCENTRATION (mg/L)						
1	2015-May-06	<0.001	0.48	<0.0001	<0.0005	0.36	<0.001	<0.0001
2	2015-Oct-26	0.002	1.13	0.0001	0.0013	11.1	0.006	0.0003
3	2016-Apr-27	<0.001	<0.01	<0.0001	<0.0005	6.29	<0.001	<0.0001
4	2016-Oct-25	<0.001	0.47	0.0002	0.0012	2.56	0.011	<0.0001
5	2017-May-11	<0.001	0.31	<0.0001	0.001	1.85	0.004	-
6	2017-Oct-25	<0.001	1.07	0.0001	0.0008	2.5	0.005	-
7	2018-May-09	<0.001	0.15	<0.0001	<0.0005	0.92	<0.001	-
8	2018-Oct-24	0.003	0.27	<0.0001	0.0005	1.28	<0.001	-
9	2019-May-06	0.002	0.03	<0.0001	<0.0005	0.149	<0.001	-
10	2020-May-05	<0.001	0.02	<0.0001	<0.0005	0.182	<0.001	-
11	2020-Oct-08	0.003	0.04	<0.0001	<0.0005	0.729	<0.001	-
12	2021-Apr-19	<0.001	<0.02	<0.0001	<0.0005	0.1	<0.001	-
13	2021-Oct-20	0.003	0.15	<0.0001	<0.0005	1.47	<0.001	-
14	2022-May-04	<0.001	0.02	<0.0001	<0.0005	0.148	<0.001	-
15	2023-May-02	<0.001	<0.02	<0.0001	<0.0005	0.091	<0.001	-
16	2024-May-01	0.0023	<0.02	<0.00009	<0.0005	0.21	<0.0005	-
17	2025-May-05	<0.001	0.045	<0.00009	<0.0005	3.5	<0.0005	-
18								
19								
20								
Coefficient of Variation:		0.20	1.18	0.43	0.33	1.45	0.48	
Mann-Kendall Statistic (S):		3	-48	0	-10	-56	-2	
Confidence Factor:		64.0%	99.9%		99.2%	98.9%	62.5%	
Concentration Trend:		No Trend	Decreasing		Decreasing	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.

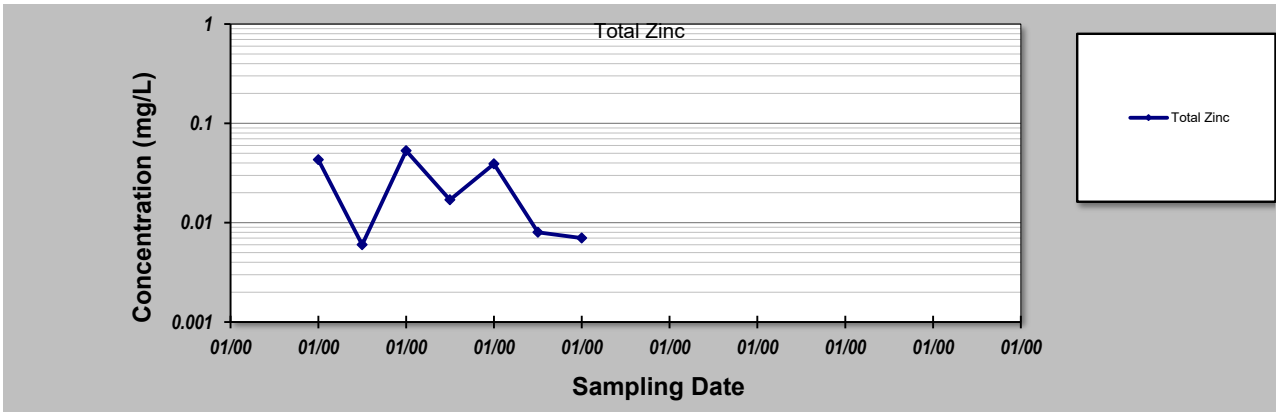
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-SW2
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID: Total Zinc

Sampling Event	Sampling Date	MG-SW2 CONCENTRATION (mg/L)
1	2015-May-06	<0.005
2	2015-Oct-26	0.043
3	2016-Apr-27	0.006
4	2016-Oct-25	0.053
5	2017-May-11	0.017
6	2017-Oct-25	0.039
7	2018-May-09	0.008
8	2018-Oct-24	0.007
9	2019-May-06	<0.005
10	2020-May-05	<0.005
11	2020-Oct-08	<0.005
12	2021-Apr-19	<0.005
13	2021-Oct-20	<0.02
14	2022-May-04	<0.02
15	2023-May-02	<0.02
16	2024-May-01	<0.005
17	2025-May-05	<0.005
18		
19		
20		
Coefficient of Variation:		0.80
Mann-Kendall Statistic (S):		-7
Confidence Factor:		80.9%
Concentration 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.

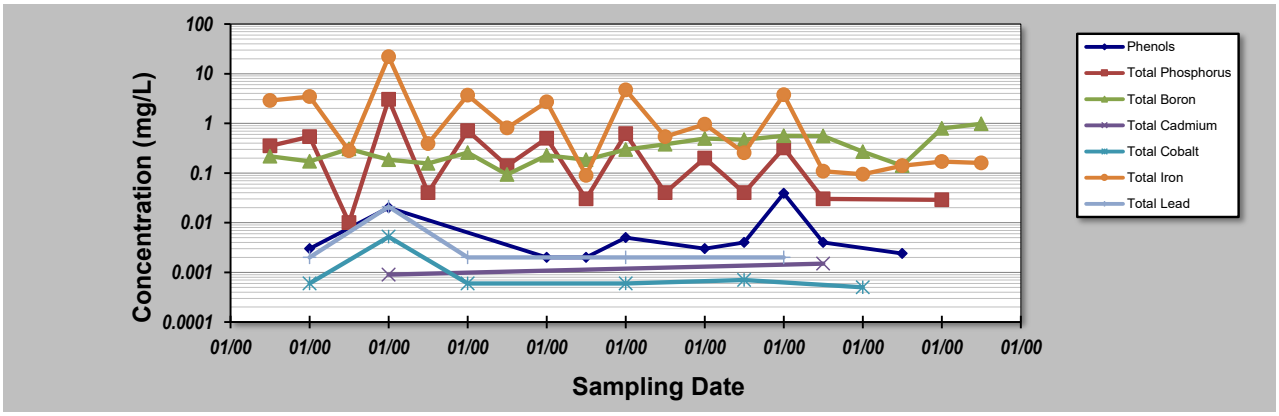
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-SW3
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Phenols	otal Phosphoru	Total Boron	Total Cadmium	Total Cobalt	Total Iron	Total Lead
Sampling Event	Sampling Date	MG-SW3 CONCENTRATION (mg/L)						
1	2015-May-06	<0.001	0.35	0.218	<0.0001	<0.0005	2.87	<0.001
2	2015-Oct-26	0.003	0.54	0.171	<0.0001	0.0006	3.45	0.002
3	2016-Apr-27	<0.001	0.01	0.305	<0.0001	<0.0005	0.28	<0.001
4	2016-Oct-25	0.02	3.03	0.185	0.0009	0.0052	21.9	0.021
5	2017-May-11	<0.001	0.04	0.156	<0.0001	<0.0005	0.39	<0.001
6	2017-Oct-25	<0.001	0.71	0.257	<0.0001	0.0006	3.69	0.002
7	2018-May-09	<0.001	0.14	0.093	<0.0001	<0.0005	0.81	<0.001
8	2018-Oct-24	0.002	0.5	0.226	<0.0001	<0.0005	2.71	<0.001
9	2019-May-06	0.002	0.03	0.186	<0.0001	<0.0005	0.09	<0.001
10	2019-Oct-21	0.005	0.62	0.297	<0.0001	0.0006	4.73	0.002
11	2020-May-05	<0.001	0.04	0.379	<0.0001	<0.0005	0.537	<0.001
12	2020-Oct-08	0.003	0.2	0.496	<0.0001	<0.0005	0.96	<0.001
13	2021-Apr-19	0.004	0.04	0.47	<0.0001	0.0007	0.256	<0.001
14	2021-Oct-20	0.039	0.32	0.564	<0.0001	<0.0005	3.75	0.002
15	2022-May-04	0.004	0.03	0.559	0.0015	<0.0005	0.109	<0.001
16	2023-May-02	<0.001	<0.02	0.268	<0.0001	0.0005	0.094	<0.001
17	2024-May-01	0.0024	<0.02	0.14	<0.00009	<0.0005	0.14	<0.0005
18	2024-Oct-30	<0.001	0.029	0.79	<0.00009	<0.0005	0.17	<0.0005
19	2025-May-05	<0.001	<0.02	0.98	<0.00009	<0.0005	0.16	<0.0005
20								
Coefficient of Variation:		1.42	1.78	0.67	0.35	1.37	2.00	1.47
Mann-Kendall Statistic (S):		4	-34	81	1	-4	-61	-2
Confidence Factor:		60.3%	93.0%	99.8%		70.3%	98.3%	59.2%
Concentration Trend:		No Trend	Prob. Decreasing	Increasing		No Trend	Decreasing	No Trend



Notes:

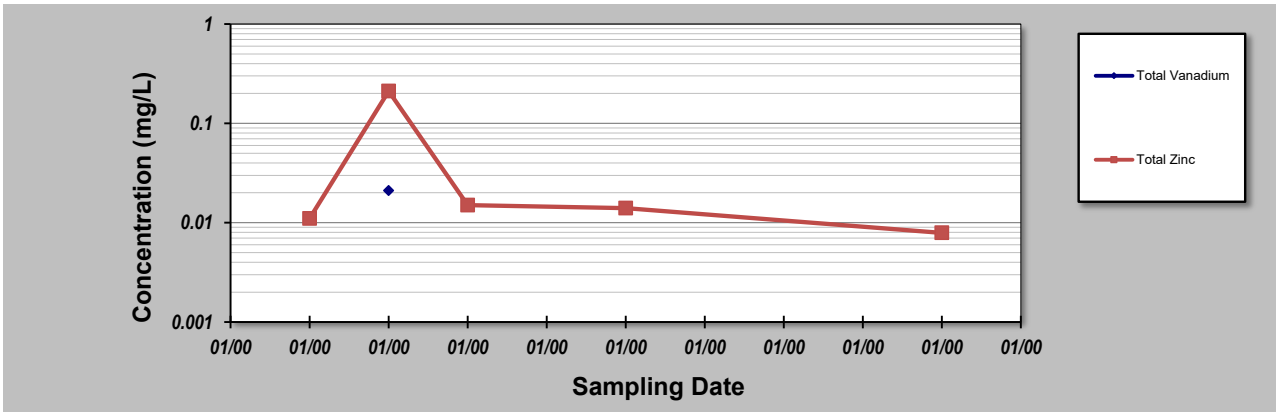
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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 MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-SW3
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Total Vanadium	Total Zinc					
Sampling Event	Sampling Date	MG-SW3 CONCENTRATION (mg/L)					
1	2015-May-06	<0.002	<0.005				
2	2015-Oct-26	<0.002	0.011				
3	2016-Apr-27	<0.002	<0.005				
4	2016-Oct-25	0.021	0.211				
5	2017-May-11	-	<0.005				
6	2017-Oct-25	-	0.015				
7	2018-May-09	-	<0.005				
8	2018-Oct-24	-	<0.005				
9	2019-May-06	-	<0.005				
10	2019-Oct-21	-	0.014				
11	2020-May-05	-	<0.005				
12	2020-Oct-08	-	<0.005				
13	2021-Apr-19	-	<0.005				
14	2021-Oct-20	-	<0.02				
15	2022-May-04	-	<0.02				
16	2023-May-02	-	<0.02				
17	2024-May-01	-	<0.005				
18	2024-Oct-30	-	0.0079				
19	2025-May-05	-	<0.005				
20							
Coefficient of Variation:			1.72				
Mann-Kendall Statistic (S):			-4				
Confidence Factor:			75.8%				
Concentration Trend:			No Trend				



Notes:

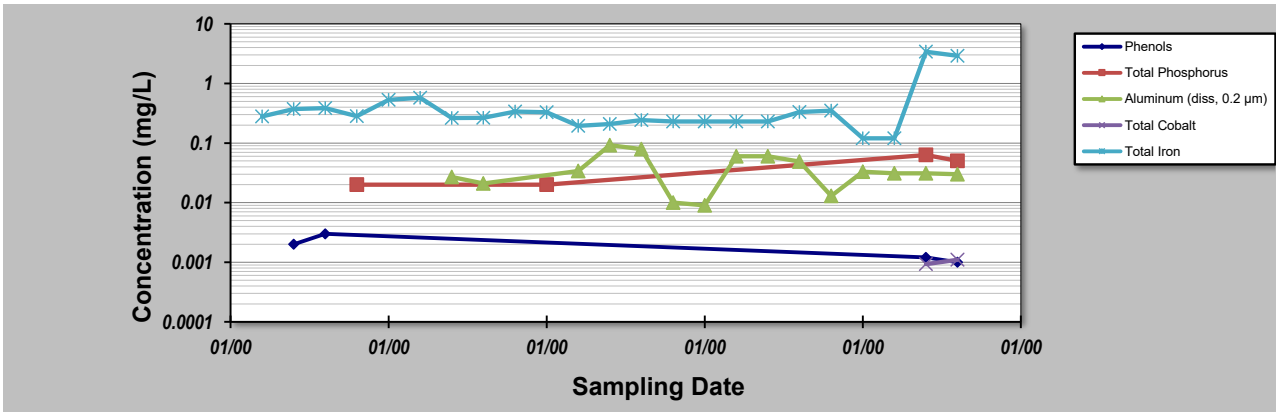
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-SW4A
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Phenols	otal Phosphoru	minum (diss, 0.2	Total Cobalt	Total Iron		
Sampling Event	Sampling Date	MG-SW4A CONCENTRATION (mg/L)						
1	2020-May-05	<0.001	<0.02	-	<0.0005	0.281		
2	2020-Oct-08	0.002	<0.02	-	<0.0005	0.371		
3	2020-Oct-08	0.003	<0.02	-	<0.0005	0.385		
4	2021-Apr-19	<0.001	0.02	-	<0.0005	0.283		
5	2021-Oct-20	<0.001	<0.02	-	<0.0005	0.529		
6	2021-Oct-20	<0.001	<0.02	-	<0.0005	0.573		
7	2022-May-04	<0.001	<0.02	0.027	<0.0005	0.264		
8	2022-May-04	<0.001	<0.02	0.021	<0.0005	0.265		
9	2022-Oct-25	<0.001	<0.02	-	<0.0005	0.337		
10	2022-Oct-25	<0.001	0.02	-	<0.0005	0.327		
11	2023-May-02	<0.001	<0.02	0.034	<0.0005	0.195		
12	2023-May-02	<0.001	<0.02	0.092	<0.0005	0.208		
13	2023-May-03	-	<0.02	0.079	<0.0005	0.243		
14	2023-Oct-18	<0.001	<0.02	0.01	<0.0005	0.23		
15	2023-Oct-18	<0.001	<0.02	0.009	<0.0005	0.23		
16	2024-May-01	<0.001	<0.02	0.06	<0.0005	0.23		
17	2024-May-01	<0.001	<0.02	0.06	<0.0005	0.23		
18	2024-Oct-30	<0.001	<0.02	0.049	<0.0005	0.33		
19	2024-Oct-30	<0.001	<0.02	0.013	<0.0005	0.35		
20	2025-May-05	<0.001	<0.02	0.033	<0.0005	0.12		
21	2025-May-05	<0.001	<0.02	0.031	<0.0005	0.12		
22	2025-Oct-16	0.0012	0.063	0.031	0.00093	3.4		
23	2025-Oct-16	0.001	0.05	0.03	0.0011	2.9		
24								
25								
Coefficient of Variation:		0.51	0.57	0.64	0.12	1.55		
Mann-Kendall Statistic (S):		-4	3	-13	1	-44		
Confidence Factor:		83.3%	72.9%	72.1%		87.1%		
Concentration Trend:		Stable	No Trend	Stable		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.

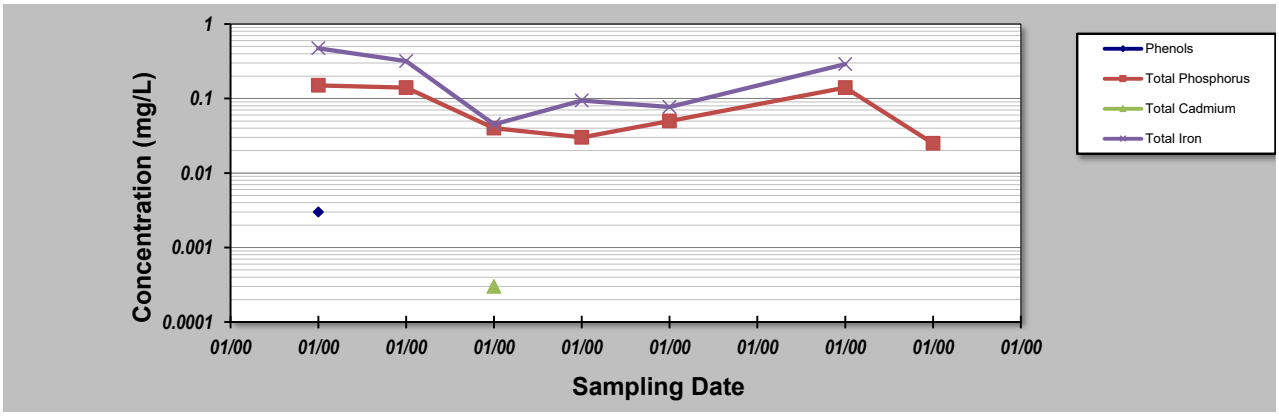
DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-SW6
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Phenols	otal Phosphoru	Total Cadmium	Total Iron			
Sampling Event	Sampling Date	MG-SW6 CONCENTRATION (mg/L)						
1	2020-Aug-26	0.003	0.15	<0.0001	0.472			
2	2020-Sep-23	<0.001	0.14	<0.0001	0.318			
3	2022-May-04	<0.001	0.04	0.0003	0.045			
4	2022-Oct-25	<0.001	0.03	<0.0001	0.094			
5	2023-May-02	<0.001	0.05	<0.0001	0.077			
6	2024-May-01	<0.001	<0.02	<0.00009	<0.1			
7	2024-Oct-30	<0.001	0.14	<0.00009	0.29			
8	2025-May-05	<0.001	0.025	<0.00009	<0.1			
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:			0.70		0.79			
Mann-Kendall Statistic (S):			-10		-5			
Confidence Factor:			90.7%		76.5%			
Concentration Trend:			Prob. Decreasing		Stable			



Notes:

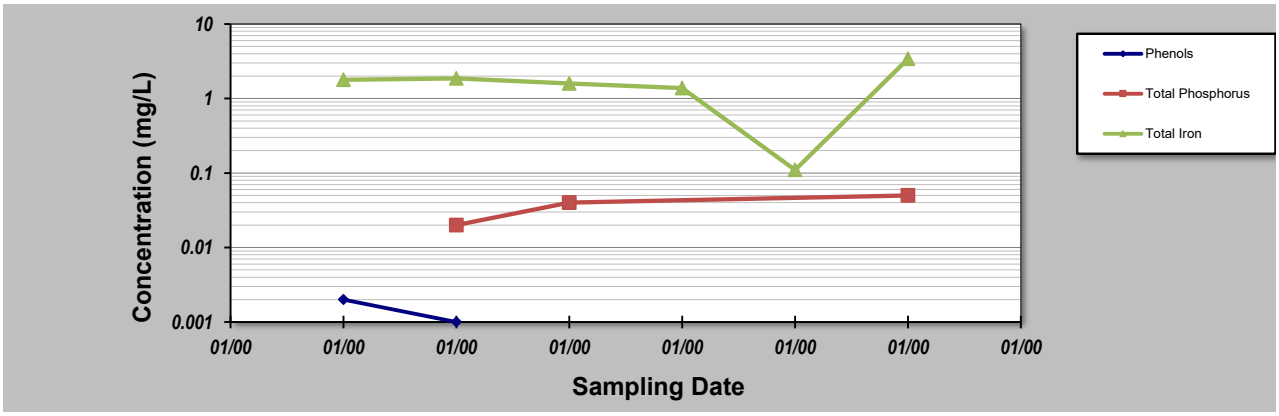
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably 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:	12-Feb-26	Job ID:	250253-07
Facility Name:	Musclow WDS	Constituent:	MG-SW7
Conducted By:	Oscar Fisher	Concentration Units:	mg/L

Sampling Point ID:	Phenols	otal Phosphoru	Total Iron				
Sampling Event	Sampling Date	MG-SW7 CONCENTRATION (mg/L)						
1	2020-Aug-26	0.002	<0.02	1.79				
2	2020-Aug-26	0.001	0.02	1.86				
3	2020-Sep-23	<0.001	0.04	1.59				
4	2020-Sep-23	<0.001	<0.02	1.38				
5	2025-May-05	<0.001	<0.02	0.11				
6	2025-Oct-16	<0.001	0.05	3.4				
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.47	0.42	0.62				
Mann-Kendall Statistic (S):		-1	3	-3				
Confidence Factor:				64.0%				
Concentration 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.*



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