Blind River

Town of Blind River Municipal Landfill Site

ANNUAL MONITORING AND OPERATIONS REPORT – 2023

July 2024
KEC Ref: 2331

Prepared by:

KRESIN Engineering Corporation

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1.0 INTRODUCTION

The purpose of this Annual Monitoring and Operations Report for the Town of Blind River Municipal landfill site (Site) is to meet the annual reporting requirements identified in the Site Operations and Maintenance Plan (O&M Plan). The O&M Plan indicates that the Annual Operations Report should comply with the requirements of the Environmental Protection Act as legislated under Regulation 232/98. It is noted, however, that the Site and its operation are subject to Regulation 347. Copies of the Environmental Compliance Approval (ECA), formerly C of A, and subsequent amendments are included in Appendix A. A copy of the stormwater management ECA for the waste disposal site (ECA No. A-500-7134513066, issued October 26, 2022) is also provided in Appendix A.

This document reports on monitoring and operations at the Site for the 2023 operating year and was prepared with reference to the MECP's *"Technical Guidance Document, Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water (Nov. 2010)".* This document also addresses Annual Reporting requirements identified in the O&M Plan.

1.1 Location

The Site is located approximately 2 kilometers east of the built-up section of the Town of Blind River on the north side of Highway 17 (shown on Drawing B1). The Site is legally described as the south ½ of Lot 7, Concession 1 of Striker Township in the District of Algoma.

The coordinates of the Site, acquired through the use of a GPS surveying system (NAD83) with a horizontal accuracy of less than 5 centimeters (cm), are as follows:

	UTM Coordinates
Northing	5116641.907m
Easting	354605.951m
Zone	17T
Latitude (decimal degrees)	46.187825
Longitude (decimal degrees)	-82.884092

1.2 Waste Accepted

Under the current ECA, the Site is approved to receive domestic, commercial, non-hazardous solid industrial waste, scrap wood and brush, and iron sludge waste generated from the potable water treatment facility located at Cameco Corporation in Blind River.

Household hazardous wastes are not accepted at the Site but are collected during Household Hazardous Waste days that are held on a regular basis, historically once every 2 years. The last Household Hazardous Waste Day took place in July of 2022.

The Site services a population of approximately 3,450 people along with the area industrial, commercial and institutional (ICI) Sectors. A curb side waste collection program is in place in the Town of Blind River, providing weekly refuse pick-up. The collection programs are run by a private company under contract with the Town. Waste is deposited at the Site by the contractor who collects municipal waste by residential/commercial direct-haul.

1.3 Ownership and Key Personnel

The Town of Blind River owns the Site. Key personnel and their respective contact details are included in Table 1.

TABLE 1:
LANDFILL SITE KEY PERSONNEL

Contact	Contact Details
Town of Blind River - Primary Contact	Chris Zagar Town of Blind River, Director of Public Works 11 Hudson Street, P.O. Box 640 Blind River, ON P0R 1B0 Phone: 705-356-2601 Fax: 705-356-7343 Email: Chris.Zagar@blindriver.ca
Town of Blind River - Secondary Contact	Kathryn Scott Town of Blind River, COA/Clerk 11 Hudson Street, P.O. Box 640 Blind River, ON P0R 1B0 Phone: 705-356-2251 Fax: 705-356-7343 Email: Katie.Scott@blindriver.ca
Blind River Landfill Site Operator	GFL Environmental Inc. 9 Industrial Park Road East Blind River, ON P0R 1B0 Phone: 705-356-4118
Competent Environmental Practitioner	Chris Kresin, M. Sc. (Eng.), P.Eng Kresin Engineering Corporation 536 Fourth Line East Sault Ste. Marie, ON P6A 6J8 Phone: 705-949-4900 Fax: 705-949-9965 Email: info@kresinengineering.ca

1.4 Description and Development of the Waste Disposal Site

Information obtained from Town sources (both written records and verbal accounts) indicates that the landfill site, which services the urban and rural areas of the Town of Blind River, has been receiving municipal wastes since about 1970.

The Site operates under authority of the original ECA No. A7138701 dated November 1980. It stipulates the following conditions:

1. Total site area is 2 ha (further defined by an attached sketch);
2. Site to accept domestic, commercial and “other” (limited to wood scrap and brush) wastes; and
3. C of A to be registered on title.

The original C of A was amended on two (2) occasions;

1. April 1994: added “non-hazardous solid industrial wastes and iron sludge” as allowable wastes for disposal at the Site; and
2. January 2000: added “the use of sawdust as interim cover” for a two (2) year period.

The Site is operated by the Contractor named above, who also provides waste collection services under one contract with the Town. Duties of the landfill site operator include:

1. Collect and dispose of residential municipal waste from curb side;
2. Collect and dispose of commercial and institutional municipal waste as well as waste from municipal parks;
3. Collect and dispose of municipal waste from several 4 and 6 cubic yard tip dumpsters located throughout the Town;
4. Bulldoze waste and apply cover as required by the Town and the Ministry of the Environment, Conservation and Parks;
5. Coordinate the establishment of marshalling areas, designated waste and disposal areas and recycling areas with the site attendant;
6. Designating, signing and maintaining all waste areas in coordination with the site attendant; and
7. Provide monthly reports of volumes of waste collected.

Placement of landfill cover material generally occurs following each day that the Site is operational. The landfill site operator employs a large sheepsfoot landfill compactor to compact waste in-situ, to apply cover material and to shape the Site topography as required.

A landfill attendant is on Site at all times during operating hours in order to observe the work on behalf of the Contractor for the purpose of ensuring the Contractor’s compliance with the Contract. Attendant duties also include:

1. Stop and check all vehicles entering the Site to determine amounts and types of material to be deposited and ensure that waste is deposited in designated areas;
2. Ensure that only waste collected in the Town of Blind River is deposited in the landfill site;
3. Enforce, collect and complete waybills for all applicable landfill tipping fees;
4. Collect data on a daily basis of all volumes and types of material deposited and record same on forms provided by the Town;
5. Ensure that all waste disposed of meets criteria and regulations of the Ministry of the Environment, Conservation and Parks and all other applicable government regulations;
6. Ensure proper backfill procedures are used;
7. Monitor and supervise pest control services; and
8. Perform other duties of a minor nature that may be required from time to time.

Entry to the Site is from the south and fill activities in 2023 occurred in the raised section of the landfill site as well as various piles around the perimeter of the raised section as shown on Drawing B2. An attendant’s shelter and areas to dispose of materials to be diverted are situated at the termination of the main access road, just outside of the approved fill area.

The Site operates as a natural attenuation site, relying on naturally occurring physical, chemical and biological processes to reduce concentrations of contaminants below Ministry of the Environment, Conservation and Parks (MECP) limits prior to reaching the property boundaries of the Site. The Town has used the area fill method of landfilling at the Site, gradually increasing the height of the Site

throughout its operating life. The area of fill ranges in elevation from a high of approximately 213 meters above sea level, at the center of the active fill area, to a low of approximately 200 meters above sea level at the toe of the fill area. The approximate elevation found on the north side of Highway 17 at a grouping of monitoring wells is 191 meters above sea level.

In July 2004 an O&M Plan for the Site was developed. The Plan described the approach to operating the Site such as landfill capacity and waste characterization, surface and groundwater management, landfill development and operations, control and maintenance, monitoring and reporting, contingency plans as well as a closure plan.

A Hydrogeological/Engineering report for the Site was completed in September of 2002 and included in the appendices of the O&M Plan discussed above. The report was completed to address MECP's requirement outlined in a 2002 order issued to the Town that a hydrogeological study be completed. The hydrogeological investigation included monitoring well installation and groundwater sampling in order to determine source leachate strength, leachate transport through the Site and impact of leachate at the property boundary.

Figure 1 presents a conceptual site model of the Site. As stated in the MECP Technical Guidance document, "*A conceptual site model is a three-dimensional picture of site conditions that conveys what is known or suspected about the sources, releases and release mechanisms, contaminant fate and transport, exposure pathways, potential receptors, and risks. The conceptual site model is based on the information available at any given point in time and will evolve as more information becomes available*".

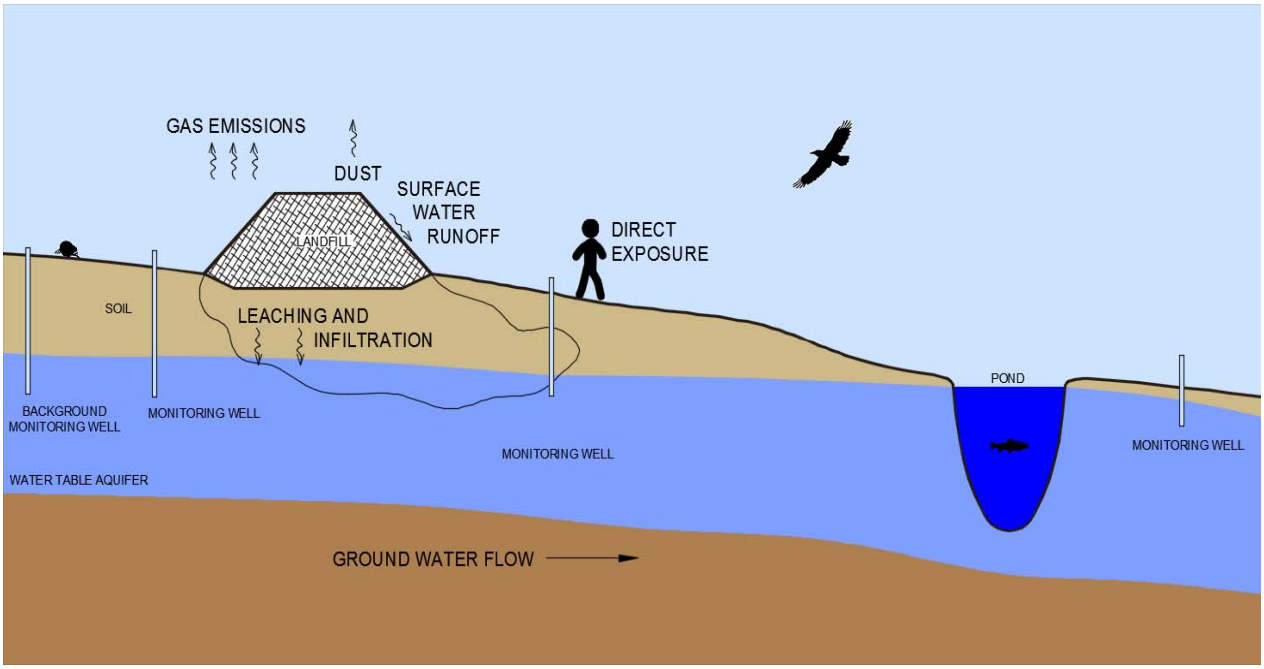


Figure 1 – Conceptual Site Model

1.5 Monitoring and Reporting Program Objectives and Requirements

As stated in the O&M Plan, this report should comply with requirements of Regulation 232/98. Regulation 232/98 "Landfilling Sites" made under the EPA outlines the requirements for Annual Operations Reports for landfill sites in Ontario. The regulation requires that:

> *The owner and the operator of a landfilling site shall ensure that,*
>
> *(a) within three months after each anniversary of the date on which waste was first accepted at the site, an annual report is prepared respecting the operation of the landfilling site, including a summary of results from monitoring programs; and*
> *(b) all of the reports are retained until at least two years after the site is closed.*

Further to the regulation, the MECP Landfill Standard Guideline states that an Annual Operations Report should include 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; previously existing site facilities; facilities installed during the reporting period; and site preparations and facilities planned for installation during the next reporting period.
d. Calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the site during the reporting period and a calculation of the total volume of site capacity used during the reporting period.
e. A calculation of the remaining capacity of the site and an estimate of the remaining site life.
f. A summary of the quantity of any leachate removed, or treated and discharged, from the site during each operating week, for sites with leachate collection.
g. A summary of the weekly, maximum daily and total annual quantity (by weight where weigh scales are provided at the site, otherwise by estimated volume as received) of waste received at the site.
h. A summary of any public complaints received by the owner and the responses made.
i. A discussion of any operational problems encountered at the site and corrective action taken; and
j. An update of the cost estimate for financial assurance and the amount which has been provided to the Director, in the case of a privately-owned site.

1.6 Assumptions and Limitations

The conclusions and recommendations presented in this report were based on the conditions observed on the specific dates and at the locations described.

While the findings, conclusions and recommendations documented in this report have been prepared in a manner consistent with the level of care and skill normally exercised by the members of the environmental science and engineering profession, this report is neither intended nor is it able to provide a totally comprehensive review of the past or present environmental conditions at the subject property.

2.0 PHYSICAL SETTING

2.1 Geology and Hydrogeology

From the 2002 Hydrogeological Investigation report:

> *"The 8.68 hectare (21.4 acre) landfill is located in a former gravel pit in the Precambrian Shield on the north shore of Lake Huron (north channel). The site is characterized by undulating terrain with relatively thin overburden and occasional rock outcrops. Lakes and poorly drained wetlands are common. Leachate is observed to collect in shallow topographic depressions on the south and east sides of the site."*

Also:

> *"According to the Northern Ontario Engineering Geology Terrain Study (VanDine 1979; Blind River Sheet NTS 41J/SE), local terrain conditions are described as till with ground moraine as the dominant landform (outwash plain is the subordinate landform). Bedrock underlies a drift veneer, local relief is moderate, and terrain is undulating to rolling."*

The area is suspected to have a high water table and the overburden in the area of the Site can be, but is typically not a local source of drinking water. The coarse-grained (sand and gravel) overburden enables the downward flow of water and contaminants and consequently provides limited protection to the overburden aquifer from surface sources of contamination.

The Site is situated in an area of relatively flat topography sloping gradually to the south toward Lake Huron. The terrain to the east and northeast of the landfill site is of higher elevations with the groundwater interpreted as flowing to the northwest, west and south, eventually discharging into Lake Huron.

2.2 Surface Water Features

The fill area is located near a topographic divide from which surface water flows in a southwesterly direction toward Highway 17 and, ultimately, Lake Huron.

Several surface water features are located in the vicinity of the site, including an area approximately 180m southwest of the fill area where surface water pools and has historically been shown to be

leachate impacted expressed groundwater. Additional features at greater distance southwest from the fill area include an excavated pit that likely intercepted the water table and marsh areas adjacent to Highway 17 (north and south of the highway). These features, and others, are included in the monitoring program described in Section 3.0.

3.0 DESCRIPTION OF MONITORING PROGRAM

The Site O&M Plan outlines the monitoring program requirements, as described in the following subsections.

3.1 Monitoring Locations

Groundwater

A groundwater monitoring network consisting of fourteen (14) monitoring wells is currently in-place at the landfill site. Monitoring wells MW1-02, MW2-02, MW3-02, MW4-02, MW5-02 and MW6-02 were installed in May 2002 while MW1-03, MW2-03 and MW3-03 were installed in October 2003. In December of 2015, MW2-03 and MW3-03 were both decommissioned and replaced with two (2) wells, MW2-15 and MW3-15, installed a short distance away from the original locations. MW1-15 and MW4-15 were also installed in 2015, just north of the fill area. MW1-17 and MW2-17 were installed close to King's Highway 17 in July 2017 south of the fill area. MW1-20 was installed in September of 2020 on the south side of King's Highway 17, approximately 370m west of the landfill access road.

Monitoring well locations are shown on Drawing B3 of Appendix B and UTM coordinates for each monitoring well are located in Table 2. Reference elevations for each location are included in Table 3. Copies of borehole logs and a photo inventory of the monitoring wells are included in Appendix C.

TABLE 2: MONITORING WELL LOCATIONS			
Monitoring Well ID	**Zone**	**Northing**	**Easting**
MW1-02	17T	5116863 m	354710 m
MW2-02	17T	5116559 m	354549 m
MW3-02	17T	5116320 m	354311 m
MW4-02	17T	5116302 m	354373 m
MW5-02	17T	5116688 m	354428 m
MW6-02	17T	5116313 m	354304 m
MW1-03	17T	5116320 m	354227 m
MW2-03	17T	5116416 m	354507 m
MW3-03	17T	5116243 m	354657 m
MW1-15	17T	5116691 m	354544 m
MW2-15	17T	5116420 m	354504 m
MW3-15	17T	5116239 m	354656 m
MW4-15	17T	5116709 m	354648 m
MW1-17	17T	5116259 m	354764 m
MW2-17	17T	5116276 m	354482 m
MW1-20	17T	5116246 m	354326 m

Monitoring well conditions and monitoring well construction details are also included in Table 3.

TABLE 3: BLIND RIVER LANDFILL – MONITORING WELL DETAILS								
Monitoring Well ID	**Top of Casing Elevation (m)**	**Well Stick-Up (m)**	**Ground Elevation (m)**	**Total Depth & Elevation (m)**	**Screened Interval & Elevation (m)**	**Well Position**	**Well Condition**	**Hydro-stratigraphic Unit Screened**
MW1-02	199.628	0.919	198.709	5.204 (194.424)	2.156-5.204 (197.472-194.424)	Up-gradient (Background)	Good	Compact silty sand & gravel/Very dense till
MW2-02	200.870	0.702	200.168	6.405 (194.465)	3.357-6.405 (197.513-194.465)	Downgradient (Source)	Good; steel casing needs new lock	Soft alluvium/Soft organics

TABLE 3:
BLIND RIVER LANDFILL – MONITORING WELL DETAILS

Monitoring Well ID	Top of Casing Elevation (m)	Well Stick-Up (m)	Ground Elevation (m)	Total Depth & Elevation (m)	Screened Interval & Elevation (m)	Well Position	Well Condition	Hydro-stratigraphic Unit Screened
MW3-02	191.494	0.911	190.583	4.27 (186.313)	1.222-4.27 (189.361-186.313)	Downgradient	Good	Loose to compact sand/Sand & gravel
MW4-02	192.186	0.76	191.426	4.971 (187.215)	1.923 - 4.971 (190.263 - 187.215)	Downgradient	Good	Loose sand/Compact sand & gravel
MW5-02	198.171	0.795	197.376	4.622 (193.549)	3.098-4.622 (195.073-193.549	Downgradient	Good	Dense sand & gravel
MW6-02	192.003	0.795	191.208	7.435 (184.568)	5.911-7.435 (186.092-184.568)	Downgradient	Good	Compact sand & gravel
MW1-03	191.621	1.038	190.583	3.495 (188.126)	1.971-3.495 (189.650-188.126	Downgradient	Lid of steel casing is broken; well cap is cracked	Loose sand/Compact sand
MW2-03	Decommissioned							
MW3-03	Decommissioned							
MW1-15	200.577	0.852	199.725	6.497 (194.110)	3.419-6.467 (197.158-194.110)	Cross-gradient	Good	Clay/Silty sand/Coarse sand
MW2-15	198.753	1.034	197.719	3.008 (195.745)	1.484-3.008 (197.269-195.745)	Downgradient	Good; steel casing loose in ground	Medium-grained sand/Silty sand/Medium to coarse sand
MW3-15	199.281	0.734	198.547	5.245	2.197-5.245 (197.084-194.036)	Cross-gradient	Good; steel casing needs new lock	Silty sand/ Fine to medium sand/Boulders/Silty sand/Fine to medium sand

TABLE 3:
BLIND RIVER LANDFILL – MONITORING WELL DETAILS

Monitoring Well ID	Top of Casing Elevation (m)	Well Stick-Up (m)	Ground Elevation (m)	Total Depth & Elevation (m)	Screened Interval & Elevation (m)	Well Position	Well Condition	Hydro-stratigraphic Unit Screened
MW4-15	204.329	0.749	203.580	5.464 (198.96)	2.416-5.464 (201.913-198.865)	Cross-gradient	Good	Medium to coarse sand/Silty sand/Fine to medium sand
MW1-17	199.918	0.884	199.034	3.058 (196.860)	1.534-3.058 (198.384-196.860)	Cross-gradient	Good	Cobbles/Gravel/ Fine dry to wet sand
MW2-17	194.786	0.752	194.034	5.147 (189.639)	2.099-5.147 (192.687-189.639)	Downgradient	Good	Medium wet sand
MW1-20	194.915	0.881	194.034	8.325 (186.590)	5.277-8.325 (189.638-186.590)	Downgradient	Good	Silty sand/Wet

- Screened interval lengths and hydrostratigraphic information were taken directly from borehole logs.
- Screened interval depths were calculated using 2015, 2017 and 2020 ground elevations. All remaining information was collected from the 2023 monitoring field logs.
- Total depth (from top of casing) elevations and screened elevations are shown in brackets. Depths are in meters below ground surface.
- Total depth and screened elevations for MW3-02 were taken from the borehole log. Based on current measurements, it is assumed that this well contains a significant amount of material.

Surface Water

In order to assess for potential impacts on surface water in the vicinity of the Site, a surface water sample is collected twice annually from water that pools near the southwest limit of fill (SW1). In 2018, two (2) additional pooling water locations were identified using aerial photography. Both locations are similarly southwest of the fill, directly south (SW2) and west (SW3) of the solar panel field adjacent to the west of the Site. During the 2022 reporting period, areas of surface water ponding located south of the fill area (SW4 and SW5), a background surface water sampling location (SW6) and a downgradient surface water sampling location (SW7) were included as part of the Site's monitoring program.

The surface water locations are shown on Drawing B3 of Appendix B and characteristics of the locations are described in Table 4.

TABLE 4:
SURFACE WATER LOCATIONS

ID	Zone	Northing	Easting	Location Type	Sample Type
SW1	17T	5116445m	354503m	Permanent/Lentic	Downstream
SW2	17T	5116391m	354259m	Permanent/Lentic	Downstream
SW3	17T	5116483m	354146m	Permanent/Lentic	Downstream
SW4	17T	5116466m	354708m	Permanent/Lentic	Downstream
SW5	17T	5116464m	354559m	Permanent/Lentic	Downstream
SW6	17T	5116918m	354748m	Permanent/Lentic	Upstream
SW7	17T	5116288m	353683m	Permanent/Lentic	Downstream

3.2 Monitoring Frequency

Groundwater sampling events have generally occurred twice annually since 2002, the year that the groundwater monitoring network was established, and surface water sampling began in 2004.

3.3 Field and Laboratory Parameters and Analysis

Groundwater

Groundwater samples are collected and analyzed for parameters listed in Column 1 (comprehensive list) and Column 2 (indicator list) of Schedule 5 of the MECP Landfill Standards. Samples collected from MW1-03 (during the fall 2023 sampling event) and MW1-20 were also analyzed for parameters listed under Column 3 of Schedule 5 (surface water comprehensive list) of the MECP landfill standards. In addition to parameters listed in the referenced Schedules, groundwater samples were analyzed for total cyanide, fluoride, organic nitrogen and hardness during the 2023 reporting period.

Pesticides listed under Schedule 24 of Ontario Regulation 170/03 have also been analyzed for periodically during sampling events.

Following their collection, water samples are packaged and shipped for analysis in accordance with instructions from the laboratory.
Field measurements include pH, temperature, dissolved oxygen and conductivity.

Surface Water

Surface water samples are collected and analyzed for parameters listed in Column 3 of Schedule 5 (comprehensive list) of the MECP Landfill Standards. In addition to the parameters listed in the referenced Schedule, surface water samples were also analyzed for dissolved manganese, dissolved zinc, hardness and DOC during the 2023 reporting period.

Field measurements include pH, temperature, dissolved oxygen and conductivity.

3.4 Certificate of Approval Requirements

The current C of A No. A7138701 for the Site does not stipulate monitoring program requirements; therefore, reference is made to ECA No. A-500-7134513066, Regulation 232/98 and the MECP Landfill Standard Guideline document in this regard.

3.5 Monitoring Procedures and Methods

Sample collection is conducted by KEC staff in accordance with KEC's "Groundwater Monitoring and Sampling Protocol", and "Surface Water Monitoring and Sampling Protocol", both attached in Appendix D of this report.

3.6 Standard Operating Procedures

Standard operating procedures followed during the 2023 spring and fall sampling events is attached in Appendix D of this report.

3.7 Record Keeping and Field Notes

All relevant information collected in support of this monitoring report is maintained and kept at the KEC office located in Sault Ste. Marie, ON. Copies of the monitoring well record sheets from the 2023 spring and fall sampling event are included in Appendix E of this report.

3.8 Sampling Methods

Groundwater

Prior to purging, static water levels are measured using a water level tape at each monitoring well location and recorded on a monitoring well record sheet. Water levels and well depth measurements are taken from the top of the PVC casing of each monitoring well. Water levels are recorded prior to removing the dedicated sampling equipment.

Prior to collecting groundwater samples, each monitoring well is purged to remove the stagnant water within the well to allow the sampling of fresh groundwater to occur. Three (3) well casing volumes are removed (or purged dry for slow inflow monitors) using a dedicated inertial lift D-25 foot valve and polyethylene tubing.

Groundwater samples are collected using disposable sampling gloves, dedicated sampling equipment and suitable sample bottles provided by the analyzing laboratory. Depending on the parameter to be analyzed, the appropriate preservative is placed in the bottle by the laboratory prior to shipping. Groundwater samples to be analyzed for metals are field filtered using a 0.45 μm groundwater filter.

Following collection, groundwater samples are placed into coolers with ice, sample identification and chain of custody forms and shipped via local ground transportation services to ALS Environmental located in Thunder Bay, ON for analysis.

Surface Water

Surface water samples are collected using disposable sampling gloves and suitable sample bottles provided by the analyzing laboratory. Similarly to the groundwater samples, depending on the parameters to be analyzed for, the appropriate preservative is placed in the bottles by the accredited laboratory prior to shipping. Samples are collected using a sample bottle (rinsed three times per location) to transfer surface water to laboratory sampling containers. Surface water samples to be analyzed for dissolved metals are field filtered using a 0.45 μm filter

Following collection, surface water samples are placed into coolers with ice, sample identification and chain of custody forms and shipped via local ground transportation services to ALS Environmental located in Thunder Bay, ON for analysis.

3.9 Quality assurance for Sampling and Analysis

The quality assurance and quality control (QA/QC) program includes field duplicates, laboratory prepared trip blanks and field-prepared blanks. In addition, the testing laboratory also implements a QA/QC program that involves spiking blank samples and introducing surrogate compounds at known concentrations for analysis.

A groundwater duplicate sample and field-prepared blank were collected during the May and September 2023 sampling events. A laboratory-prepared trip blank and volatile organic compound (VOC) matrix spike were also included during each sampling event. Blank and duplicate samples are analyzed for parameters listed under Column 1 (spring) and Column 2 (fall) of Schedule 5 or the MECP Landfill Standards.

Ion Balance

Table 5 and 6 present a summary of ion balance calculations completed by the testing laboratory for each monitoring well during the sampling events. Ion balance calculations may be used to evaluate the accuracy of the laboratory's analysis of chemically stable waters by assessing the cation/anion balance within the sample. In the case of landfill leachate, ions do not necessarily balance due to the possible presence of leached metals that may become dissolved in the water samples.

The laboratory uses a series of criteria to assess the accuracy of the analysis, the first being the assessment of the anion sum. Should the anion sum for a sample be less than 3.0 meq/L and the cation sum minus the anion sum is within +/- 0.2 meq/L, the ion balance is considered acceptable. The second criterion involves the assessment of anion sums greater than or equal to 3.0 meq/L. If the anion sum for a sample is greater than or equal to 3.0 meq/L, and the cation sum - anion balance is less than 10%, the ion balance is considered acceptable in stable waters.

TABLE 5: ION BALANCE SUMMARY JUNE 2023					
Sample Location	**Anion Sum <3 meq**	**Anion Sum ≥3 meq**	**Cation Sum (meq)**	**Assessment Criteria**	
				Cation-Anion Sum (for Anions <3 meq)	**Ion Balance (%)**
MW1-02	1.35		1.23	-0.12	
MW2-02		38.9	38.5		-0.52
MW3-02		6.92	6.30		-4.69
MW4-02		4.04	3.74		-3.86
MW5-02	1.26		1.10	-0.16	
MW6-02		7.10	6.91		-1.36
MW1-03		22.7	22.0		-1.56
MW1-15		19.0	20.7		4.28
MW2-15	0.22		0.24	0.02	
MW3-15	0.68		0.76	0.08	
MW4-15	1.04		1.18	0.14	
MW1-17	2.0		2.46	**0.46**	
MW2-17	2.17		2.11	-0.06	
MW2-17 (Duplicate)	2.25		2.11	-0.14	
MW1-20		26.8	26.9		0.19
SW1		9.14	9.25		0.60
SW2	2.88		3.00	0.12	
SW3			DRY		
SW4		7.12	7.14		0.14
SW5			DRY		
SW6	0.87		0.98	0.11	
SW7		8.85	9.18		1.83

Bold and shaded values exceed laboratory criteria for ion balance acceptability.

TABLE 6: ION BALANCE SUMMARY OCTOBER 2023					
Sample Location	**Anion Sum <3 meq**	**Anion Sum ≥3 meq**	**Cation Sum (meq)**	**Assessment Criteria**	
				Cation-Anion Sum (for Anions <3 meq)	**Ion Balance (%)**
MW1-02	1.59		1.50	-0.09	
MW2-02		40.8	44.8		4.7
MW3-02		6.27	6.41		1.10
MW4-02		4.38	4.17		-2.46
MW5-02	1.27		1.10	-0.17	
MW6-02		6.06	6.04		-0.16
MW1-03		19.6	19.3		-0.77
MW1-15		19.2	20.3		2.78
MW2-15			DRY		
MW3-15	0.54		0.51	-0.03	
MW4-15	1.46		1.72	**0.26**	
MW1-17	2.63		3.08	**0.45**	

TABLE 6: ION BALANCE SUMMARY OCTOBER 2023					
Sample Location	Anion Sum <3 meq	Anion Sum ≥3 meq	Cation Sum (meq)	Assessment Criteria	
				Cation-Anion Sum (for Anions <3 meq)	Ion Balance (%)
MW2-17	1.74		1.60	-0.14	
MW2-17 (Duplicate)	1.75		1.60	-0.15	
MW1-20		27.3	28.2		1.62
SW1		11	11.8		3.51
SW2		5.79	5.62		-1.49
SW3				DRY	
SW4		5.22	5.42		-1.49
SW5				DRY	
SW6	1.24		1.23	-0.01	-0.40
SW7		12.3	12.5		0.81

Bold and shaded values exceed laboratory criteria for ion balance acceptability.

Interference or presence of a non-measured component was noted by the laboratory as potentially causing ion balances to exceed acceptable criteria. It has been noted by the laboratory that significant concentrations of ions (not considered as part of the ion balance calculation) will cause an apparent imbalance within a sample.

3.10 Supplemental Monitoring: Sediment, Benthic and/or Toxicity Monitoring

No supplemental monitoring is conducted at the Site.

3.11 Operational Monitoring

There is currently no operational monitoring (e.g. monitoring of engineered controls) performed at the site.

4.0 OVERVIEW – MONITORING RESULTS

During the 2015 spring sampling event, KEC staff reported that both MW2-03 and MW3-03 were in poor condition and should be decommissioned and replaced with new monitoring wells being installed in the same general locations. Accordingly, two new wells (MW2-15 and MW3-15) were installed in December 2015 along with MW1-15 and MW4-15. Sampling commenced at these locations during the spring 2016 event.

On January 31, 2016 the MECP (Sault Ste. Marie office) forwarded a Technical Support Section Memo produced by an MECP hydrogeologist which contained comments and recommendations based on the review of the 2015 annual monitoring report and 2016 water quality result for the Site. The recommendations included the installation of monitoring wells at a depth that shall intercept the leachate groundwater plume at three (3) locations by March 31, 2018. Accordingly, two new wells were installed on July 12, 2017 onsite south of the historical fill area (MW1-17) and onsite between MW4-02 and MW3-03 (MW2-17). In September of 2020, a monitoring well was installed offsite (across King's Highway 17) south of MW4-02 and MW6-02.

4.1 Historical Data

A summary of historical ranges of selected parameter concentrations for all groundwater and surface water monitoring locations are shown in Table 7.

TABLE 7:
HISTORICAL RANGES OF SELECTED PARAMETERS

Parameter (mg/L)	Iron	Manganese	Alkalinity	Chloride	DOC	pH	TDS
ODWS	**0.3**	**0.05**	**500**	**250**	**5**	**6.5-8.5**	**500**
MW1-02	ND-46	0.003-7.09	1-170	0.63-729	ND-16	6.45-7.75	110-2260
MW2-02	ND-198	0.345-3.37	800-1680	65-305	19-732	6.42-7.67	1000-2580
MW3-02	ND-7.5	0.0155-0.706	188-379	31.9-126	10.3-24.8	7.38-8.49	282-722
MW4-02	ND-165	0.241-1.85	87.6-263	21.8-134	4.3-614	6.68-8.17	184-820
MW5-02	ND-1.2	ND-0.880	38.7-242	0.131-73.2	1.1-33	6.59-7.90	59-385
MW6-02	ND-52	0.208-1.33	100-270	43.1-69	7-20	6.47-8.07	285-440
MW1-03	1.43-31	0.0266-0.885	12.6-257	0.087-647	2.8-39.1	3.10-7.99	140-1300
MW2-03	0.306-120	0.019-1.6	9-147	0.63-1.7	2-27	5.92-6.51	50-385
MW3-03	0.019-0.81	0.0028-0.0417	2.9-180	4.38-23.7	1.7-13	5.38-6.30	32-240
MW1-15	0.697-10.8	2.83-4.55	794-893	66.9-88.7	10.3-34.3	6.65-7.45	878-1200
MW2-15	0.018-0.134	0.00184-0.0377	7.6-25.1	ND-1.73	2.33-10.7	5.69-6.54	28-172
MW3-15	0.398-5.98	0.23-1.37	13.7-70.8	4.95-12.7	2.72-22.9	6.12-6.80	75-685
MW4-15	0.291-9.83	0.135-1.97	35.2-66	0.84-2.32	1.6-7.5	6.11-7.25	68-340
MW1-17	0.246-15.3	0.00765-1.04	44.7-134	8.9-27.7	12.2-30.9	6.41-7.21	151-2340
MW2-17	ND-0.156	ND-0.0076	38.2-72	2.53-100	1.37-8.7	6.54-7.68	121-448
MW1-20	0.061-26.2	0.0163-6.73	70.3-83.2	0.77-910	2.63-14.4	6.64-7.49	162-2260
SW1	0.18-19.6	0.082-0.768	198-678	29.6-238	16-28.2	7.08-8.48	282-1050
SW2	0.308-2.8	0.0115-0.0586	112-243	9.64-34.8	16.6-22.6	7.61-8.47	135-358
SW3	1.36-5.83	NT	24.3-30.5	7.34-24.1	NT	6.35-6.97	80-86
SW4	14.6-43	0.00408-0.191	164-304	32.8-50.6	23.6-64.9	7.56-8.3	286-429
SW5	11.1-16	0.544	168-376	16.4-52.3	NT	7.98-8.34	213-434
SW6	0.246-2.63	0.0126-1.43	31-49.8	ND-1.53	17-27.5	7.49-7.7	54-101
SW7	3.76-69.1	0.295-1.32	65-167	231-566	8.74-37.2	6.87-8.01	524-1220

ODWS – Ontario Drinking Water Standards
ND – Not Detected; NT – Not Tested DOC – Dissolved Organic Carbon; TDS – Total Dissolved Solids

4.2 Data Quality Evaluation

The groundwater and surface water analyses were completed by ALS Environmental in Thunder Bay, Ontario. The laboratory is accredited to ISO/IEC 17025:2005 (E). Certificates of analysis from the accredited laboratory are included in Appendix F for the current reporting period.
QA/QC data was assessed by calculating the relative percent difference (RPD) for field duplicate samples. A field duplicate was collected at MW2-17 during the spring and fall sampling events. Parameter concentrations for the duplicates were found to be similar to the original, with the exception of those summarized in Table 8 below. Parameter concentrations greater than or equal to 5 times the laboratory method detection limit (MDL) with a RPD of less than or equal to 20 percent (between original and duplicate sample) were deemed acceptable. Parameter concentrations less than or equal to

5 times the MDL with a concentration difference less than or equal to the MDL were deemed acceptable.

TABLE 8:
QUALITY ASSURANCE/QUALITY CONTROL EVALUATION

Monitoring Location	Sampling Event	Parameter	QA/QC Evaluation	
			Parameter Concentration ≥5x MDL and RPD > 20%	Parameter Concentration <5x MDL and Difference >MDL
MW2-17	Spring 2023	TSS	✘	
		TDS	✘	
		DOC	✘	
MW2-17	Fall 2023	TSS	✘	
		DOC	✘	

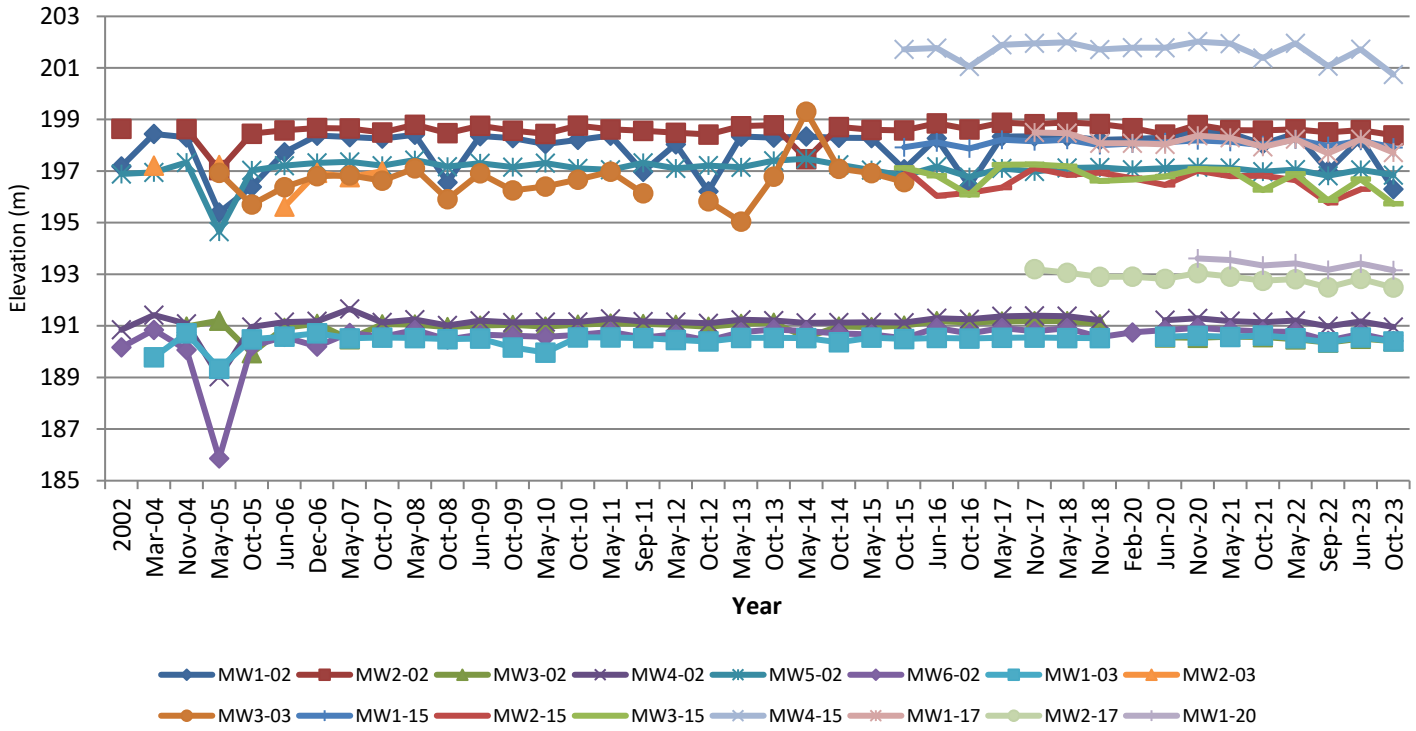
TSS – Total Suspended Solids; TDS – Total Dissolved Solids; DOC – Dissolved Organic Carbon

Results not satisfying the requirements of the QA/QC evaluation should be interpreted with caution. Regarding the evaluation results shown in Table 8, it is generally understood and accepted that the variability of field sample duplicates is significantly more than what is observed with Laboratory Sample Duplicates.

4.3 Groundwater Flow Monitoring

Water levels appear to be relatively stable historically. In cases it appears that groundwater levels determined during different seasons (spring/fall) show the effects of drought/wet conditions at or prior to the time of the sampling events. Water levels are presented graphically in Chart 1 and in Table G.24 attached in Appendix G of this report.

Chart 1
Town of Blind River Landfill Site
Groundwater Elevations



Drawings B4, B5 and B6 of Appendix B presents the water table profiles developed as well as interpreted groundwater contours based on water tables elevations established during the 2023 spring and fall sampling events. Groundwater contours, interpreted for both 2023 sampling events suggest that flow is to the northwest, west and southwest.

4.4 Groundwater Quality Monitoring

A review of the groundwater quality data summarized in Table G.1 through G.16 (Appendix G) reveals that Ontario Drinking Water Quality Standards (ODWS) are commonly exceeded for iron, manganese and DOC in most wells including MW1-02 (background well).

1. Samples from MW2-02 (source well) have historically contained volatile organic compounds (VOCs) including: benzene, toluene (2002 and June 2006), 1,4-dichlorobenzene and chlorobenzene. During the 2021 spring and fall sampling events, benzene was detected above ODWS and 1,4-dichlorobenzene was detected below ODWS. Pesticides (carbaryl and benzo(a)pyrene) have been detected historically at this location but at levels below ODWS.

2. The pesticide carbaryl was detected at boundary well MW4-02 in October 2005.

3. Benzo(a)pyrene was detected at boundary well MW6-02 in October 2005 along with benzene at MW1-03 during the same sampling event.

4. Pesticides did not exceed ODWS during any sampling event from 2006-2008 and 2012, therefore analysis for these parameters has not been carried out since.

Parameters exceeding ODWS during the 2023 reporting period are presented in Table 9.

Table 9: Summary of Review of 2023 Analytical Data

Location	Parameters Exceeding ODWS	
	Spring	Fall
MW1-02	None	None
MW2-02	Alkalinity, Chloride, Iron, Manganese, Sodium, TDS, DOC, Benzene	Alkalinity, Chloride, Iron, Manganese, Sodium, TDS, DOC, Benzene
MW3-02	Manganese, DOC	Manganese, DOC
MW4-02	Iron, Manganese, DOC	Iron, Manganese, DOC
MW5-02	None	None
MW6-02	Iron, Manganese, DOC	Iron, Manganese, DOC
MW1-03	Chloride, Iron, Manganese, Sodium, TDS, DOC	Chloride, Iron, Manganese, Sodium, TDS, DOC
MW1-15	Alkalinity, Iron, Manganese, TDS, DOC	Alkalinity, Iron, Manganese, TDS, DOC
MW2-15	None	Dry
MW3-15	Iron, Manganese	Iron, Manganese
MW4-15	Iron, Manganese	Iron, Manganese
MW1-17	Iron, Manganese, DOC	Iron, Manganese, DOC
MW2-17	None	None
MW1-20	Chloride, Iron, Manganese, Sodium, TDS, DOC	Chloride, Iron, Manganese, Sodium, TDS, DOC

4.4.1 Reasonable Use Assessment

MECP's Reasonable Use policy applies to groundwater at property boundaries and typically to parameters with aesthetic and health-related concentrations in the ODWS. The calculation of Reasonable Use (RU) concentrations is developed based on the relationship:

$$C_m = C_b + x(C_r - C_b)$$

where: C_m is the maximum allowable concentration at the property boundary;
C_b is the background concentration;
C_r is the ODWS concentration; and,
x is a factor - 0.5 for aesthetic parameters, and 0.25 for health-related parameters.

The RU concentrations are developed to assess the potential impact to groundwater beneath adjacent properties. As such, monitoring wells are typically located downgradient from and near property boundaries.

RU concentrations were developed using MW1-02 as the background well, for parameters for which ODWS have been established and that are identified in Schedule 5 (Column 1 – comprehensive list) of the MECP's Landfill Standards. The Standards state that the background concentration of a contaminant in groundwater is the median value of a minimum of 5 samples collected from a location not impacted by human activity. The RU concentrations were developed using the sampling results from 20 sampling events (spring), 19 sampling events (fall) and 1 sampling event (winter) at the background monitor (MW1-02).

A summary of parameters exceeding RU concentrations during the 2023 spring and fall sampling events is presented in Table 10.A. Groundwater RU exceedances for the 2023 sampling events are tabulated graphically on Drawing B7 of Appendix B.

TABLE 10.A:
PARAMETERS EXCEEDING RU CRITERIA IN 2023

Monitoring Location	May 2023	October 2023
MW1-02 – Background	DOC	None
MW2-02 – Source	Alkalinity, Barium, Boron, Chloride, Iron, Manganese, Sodium, TDS, Benzene, DOC	Alkalinity, Barium, Boron, Chloride, Iron, Manganese, Sodium, TDS, Benzene, DOC
MW3-02 – Boundary	Manganese, pH, TDS, DOC	Manganese, pH, TDS, DOC
MW4-02 – Boundary	Iron, Manganese, DOC	Iron, Manganese, DOC
MW5-02 – Intermediate	None	None
MW6-02 – Boundary	Iron, Manganese, TDS, DOC	Iron, Manganese, pH, DOC
MW1-03 – Boundary	Barium, Chloride, Iron, Manganese, Sodium, TDS, DOC	Barium, Chloride, Iron, Manganese, Sodium, TDS, DOC
MW1-15 – Intermediate	Alkalinity, Arsenic, Boron, Iron, Manganese, TDS, Benzene, DOC	Alkalinity, Boron, Iron, Manganese, TDS, DOC
MW2-15 – Intermediate	pH	NA
MW3-15 – Boundary	Iron, Manganese	Iron, Manganese, pH
MW4-15 – Intermediate	Iron, Manganese	Iron, Manganese, pH
MW1-17 – Boundary	Iron, Manganese, DOC	Iron, Manganese, DOC
MW2-17 – Boundary	None	None
MW1-20 - Boundary	Barium, Chloride, Iron, Manganese, Sodium, TDS, DOC	Barium, Chloride, Iron, Manganese, Sodium, TDS, DOC

Health-related parameters that were identified as having exceeded the RU Criteria during the spring and fall sampling events were barium, boron and benzene at MW2-02 (source well) and barium at MW1-03 and MW1-20. MW1-15 also exceeded RU Criteria for arsenic, boron and benzene during the spring sampling event and for boron during the fall sampling event.

Table 10.B presents a summary of RU concentrations and analytical results for the parameters identified in Schedule 5 (Column 1 – comprehensive list) of the MECP's Landfill Standards for the spring 2023 sampling event.

Table10.C presents a summary of RU concentrations and analytical results for the parameters identified in Schedule 5 (Column 2 – indicator list) of the MECP's Landfill Standards for the fall 2023 sampling event.

Groundwater quality trending charts are included in Appendix H. Concentrations of critical contaminants such as vinyl chloride and toluene, were only analyzed for at the source well and were found at levels that are orders of magnitude less than the RU Criteria established using historical data. Chloride which is considered a critical contaminant exceeded RU Criteria at the source well during the 2023 spring and fall sampling events.

With respect to the parameters identified in Tables 9.A as exceeding RU criteria:

1. With reference to the analytical results summarized in Tables G.1 to G.16, alkalinity is found to generally vary linearly (increase) with bicarbonate and calcium levels. Leachate related process that may increase alkalinity include the dissolution of calcium carbonate and the introduction of carbon dioxide through the decomposition process. Alkalinity may be a reliable leachate indicator parameter in this case.

2. Barium and boron can be found in groundwater and/or surface water due to leaching and erosion of sedimentary rocks if present beneath the sampled area. Both barium and boron are health-related parameters and in some cases can be reliable indicators of leachate-related impacts from landfill activities in sampled groundwater and/or surface water. Barium and boron appear to be elevated at MW2-02 (source well) during the spring and fall sampling events but not at MW1-02 (background monitor), therefore these parameters may be reliable indicators in this case.

3. Arsenic is released naturally from bedrock and soil with the process being enhanced by human activity, such as landfilling. Arsenic is a health-related parameter and in some cases can be a reliable indicator of leachate-related impacts from landfill activities in sampled groundwater and/or surface water. Arsenic appears to be elevated at MW1-15 during the spring sampling event but not at the background well MW1-02. Accordingly, arsenic may be a reliable indicator in this case.

4. Chloride is considered a critical contaminant and can be used as a reliable indicator of leachate impact on groundwater and/or surface water. In this case, chloride may be a reliable indicator, however, as exceedances are shown in boundary monitors MW1-03 and MW1-20 located adjacent to the Highway, impacts may also be related to winter highway salting activities.

5. Iron and manganese are usually present in landfill leachate, either waste derived or dissolved from soil particles, and are often mobile under anaerobic conditions, such as those typically present near landfills. Where natural background levels are elevated (in comparison to ODWS), these parameters are not reliable indicators. Data from the background monitor (MW1-02) reveals that iron and manganese have historically exceeded ODWS, however, these parameters

did not exceed ODWS during the 2023 sampling events.

6. Sodium is often found naturally in groundwater. Elevated levels may be natural or caused by the infiltration of surface water contaminated by road salt or landfill leachate. Sodium does not appear to be naturally elevated in water samples collected from the background monitoring well, therefore, it may be a reliable indicator in this case.

7. Total Dissolved Solids is a measure of the quantity of dissolved material in water and can provide an indication of general impact. Review of the analytical results reveals that chemical constituents are generally present at higher levels in down gradient wells with higher TDS than in MW1-02.

8. Benzene is a volatile hydrocarbon that can generally be found in petroleum products such as gasoline. When benzene is identified in landfill leachate, it is usually waste derived. Historical data from the background monitor (MW1-02) reveals concentrations below ODWS.

9. DOC is an indicator of the presence of organic matter/chemicals in leachate. DOC appears to be naturally elevated in historical water samples collected from the background monitoring well. Accordingly, DOC may not be a reliable indicator in this case.

Table 10.B presents a summary of RU concentrations and analytical results for the parameters identified in Schedule of the MECP's Landfill Standards for the 2023 spring sampling event.

TABLE 10.B: SUMMARY OF RU CRITERIA AND ANALYTICAL RESULTS – JUNE 2023

Parameter	Guideline/Monitoring Well (mg/L)																
	ODWS (Cr)	MW1 -02 (Cb)	R.U. Criteria (Cm)	MW1-02 (BG)	MW2-02 (source)	MW3-02	MW4-02	MW5-02	MW6-02	MW1-03	MW1-15	MW2-15	MW3-15	MW4-15	MW1-17	MW2-17	MW1-20
VOCs																	
1,4 Dichlorobenzene - H	0.005	0.0005	0.001625	ND	0.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene - H	0.001	0.0005	0.000625	ND	**2.38**	ND	ND	ND	ND	ND	**0.65**	ND	ND	ND	ND	ND	ND
Dichloromethane – H	0.05	0.0005	0.012875	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene – A	0.024	0.0004	0.01215	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride – H	0.002	0.00005	0.000875	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Metals																	
Arsenic – H	0.01	0.001	0.007	0.00074	ND	0.00032	0.00012	0.0002	0.00073	ND	**0.0137**	ND	0.00016	0.00192	0.00087	0.00043	0.00213
Barium – H	1	0.01195	0.258963	0.00739	**0.34**	0.0152	0.0549	0.00675	0.226	**0.375**	0.175	0.016	0.00595	0.0076	0.0257	0.0133	**0.277**
Boron – H	5	0.023	1.26725	ND	**1.88**	0.437	0.086	ND	0.118	0.248	**1.55**	ND	0.199	0.01	0.023	ND	ND
Cadmium – H	0.005	0.0001	0.0001	0.0000072	ND	0.0000067	ND	0.0000067	ND	ND	ND	ND	0.0000074	0.0000086	0.0000167	0.0000058	ND
Chromium – H	0.05	0.00076	0.01307	0.00076	ND	0.00082	ND	0.00448	0.00056	ND	ND	ND	0.00052	ND	0.00151	0.0008	ND
Copper – A	1	0.002	0.501	0.00149	ND	0.00483	0.00032	0.00518	0.00169	ND	ND	0.00258	0.00502	0.00284	0.00301	0.00052	0.00221
Iron – A	0.3	0.05	0.175	0.098	**52.9**	0.164	**4.92**	ND	**19.9**	**15.2**	**12.5**	0.018	**2.5**	**1.86**	**6.15**	ND	**26.2**
Lead – H	0.01	0.001	0.00325	0.000064	ND	ND	ND	0.000144	0.00005	ND	ND	ND	0.000161	0.00009	0.000502	ND	ND
Mercury – H	0.001	0.00055	0.000663	ND	ND	ND	ND	0.0000156	ND	ND	0.0000062	ND	0.0000053	ND	0.0000071	ND	ND
Magnesium	-	6.075	-	4.29	70	15.2	9.28	4.04	17.7	20.6	83.1	0.354	1.19	3.99	6.7	6.27	45.8
Manganese – A	0.05	0.0519	0.05095	0.0339	**0.358**	**0.122**	**0.292**	0.00065	**1.22**	**0.485**	**4.68**	0.00184	**0.83**	**1.97**	**0.654**	0.00016	**6.51**
Nickel	-		-														
Potassium	-	1.57	-	0.839	164	26.7	7.17	1.02	6.3	40.2	4.24	0.258	0.341	0.628	1.25	0.848	1.82
Sodium – A	20	6.11	103.055	4.27	**227**	38.3	28.1	3.41	30.3	**363**	65.2	1.67	8.44	3.51	19.3	13.1	**326**
Zinc - A	5	0.0085	2.50425	0.0017	ND	0.0046	0.0017	0.0043	0.0035	ND	ND	0.0038	0.0036	0.0049	0.0101	ND	ND
General Chemistry																	
Alkalinity – OG	500	74.35	287.175	56.7	**1580**	285	148	49.6	270	225	**834**	7.6	17	46.1	70.5	65.5	70.3
Ammonia	-	0.025	-	0.0074	119	0.077	0.568	ND	1.63	1.28	0.678	ND	ND	0.132	0.476	ND	2
BOD_5	-	2	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloride – A	250	0.865	125.4325	0.74	**260**	42.6	38.4	1.1	60.1	**647**	82.6	ND	6.8	0.93	17.4	22.1	**899**
COD	-	10	-	42	276	51	46	ND	69	76	98	46	10	14	130	<10	47
Cond. (us/cm)	-	169.5	-	128	3400	600	373	120	581	2310	1570	25	72.8	96	225	214	2840
DOC – A	5	3.11	4.055	**4.42**	**67.7**	**15.6**	**6.4**	1.85	**11.6**	**17.4**	**17.6**	2.78	3.85	2.9	**15.4**	2.72	**9.74**
Nitrate – H	10	0.154	2.6155	ND	ND	0.041	ND	0.105	0.056	ND	ND	ND	0.028	0.1	0.235	0.063	ND
Nitrite – H	1	0.02	0.265	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sulphate – A	500	12.1	256.05	9.42	ND	1.09	ND	11.2	ND	ND	ND	3.18	6.82	4.24	18.1	11.2	<6.00
TDS – A	500	168	334	153	**1570**	**374**	233	89	**348**	**1290**	**1000**	33	94	73	266	158	**1910**
TKN	-		-	0.282	128	1	1.06	0.204	2.24	1.84	1.65	0.379	0.377	0.371	1.21	1.6	2.76
pH	6.5-8.5	7.03	6.765-7.765	7.33	7.27	**8.09**	7.54	7.76	7.66	7.36	7.14	**6.54**	6.8	7.18	7.21	7.54	7.27
Total Phosphorus	-	0.39	2.50425	0.25	1.6	0.0379	0.255	0.0256	0.232	0.334	0.486	0.219	0.25	0.246	0.45	0.622	8.13

Notes: *A – Aesthetic, H –Health Related, OG – Operational Guideline, Cb – median value of all previous sampling events; ND – Not Detected, NT-Not Tested; Bold/shaded values exceed RU criteria.*

Table 10.C presents a summary of RU concentrations and analytical results for the parameters identified in Schedule of the MECP's Landfill Standards for the 2023 fall sampling event.

TABLE 10.C: SUMMARY OF RU CRITERIA AND ANALYTICAL RESULTS – OCTOBER 2023

Parameter	Guideline/Monitoring Well (mg/L)																
	ODWS (Cr)	MW1 -02 (Cb)	R.U. Criteria (Cm)	MW1-02 (BG)	MW2-02 (source)	MW3-02	MW4-02	MW5-02	MW6-02	MW1-03	MW1-15	MW2-15	MW3-15	MW4-15	MW1-17	MW2-17	M1-20
VOCs																	
1,4 Dichlorobenzene - H	0.005	0.0005	0.001625	NT	0.00099	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Benzene - H	0.001	0.0005	0.000625	NT	**0.00234**	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Dichloromethane – H	0.05	0.0005	0.012875	NT	ND	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Toluene – A	0.024	0.0003	0.01215	NT	ND	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Vinyl Chloride – H	0.002	0.0005	0.000875	NT	ND	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Dissolved Metals																	
Arsenic – H	0.01	0.001	0.007	NT	0.00127	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Barium – H	1	0.0119	0.258925	0.00966	**0.456**	0.0144	0.0637	0.00736	0.182	**0.321**	0.212		0.0051	0.0125	0.0396	0.0115	**0.403**
Boron – H	5	0.022	1.2665	0.018	**2.18**	0.54	0.091	ND	0.144	0.28	**1.41**		0.123	0.028	0.039	0.013	0.015
Cadmium – H	0.005	0.0001	0.0001	NT	ND	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Chromium – H	0.05	0.00076	0.01307	NT	0.00433	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Copper – A	1	0.002	0.501	NT	ND	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Iron – A	0.3	0.05	0.175	0.066	**62.2**	0.157	**4.7**	ND	**14.9**	**10.8**	**12.3**		**0.398**	**9.83**	**14.4**	ND	**24.1**
Lead – H	0.01	0.001	0.00325	NT	ND	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Mercury – H	0.001	0.00055	0.000663	NT	ND	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Magnesium	-	6.02	-	4.81	84.3	14.4	9.27	3.83	15.4	15.8	81.9		0.91	5.52	9.76	5.72	48
Manganese – A	0.05	0.0519	0.05095	0.0107	**0.361**	**0.102**	**0.303**	0.00093	**0.781**	**0.403**	**4.24**	DRY WELL	**0.236**	**1.55**	**0.892**	0.00028	**6.7**
Nickel	-		-	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Potassium	-	1.57	-	NT	178	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Sodium – A	20	6.11	103.055	5.09	**285**	40.9	32.4	3.23	29.2	**326**	63.9		5.85	3.62	10.1	4.02	**330**
Zinc - A	5	0.0085	2.50425	NT	0.0016	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
General Chemistry																	
Alkalinity – OG	500	74	287	68.1	**1680**	257	97	50.8	223	214	**850**		13.7	66	93.4	71.5	83.2
Ammonia	-	0.024	-	0.0059	132	0.0235	0.637	0.0133	1.36	0.937	0.842		0.0069	0.684	0.768	0.0107	2.3
BOD_5	-	2	-	ND	13.4	ND	ND	ND	ND	2.3	4.6		ND	ND	6.4	ND	ND
Chloride – A	250	0.86	125.43	0.79	**255**	36.2	85.5	1.02	56.3	**543**	76.8		5.08	1.97	25.8	2.56	**910**
COD	-	10	-	ND	252	43	34	ND	36	76	53		50	56	86	67	67
Cond. (us/cm)	-	169	-	153	3670	582	475	124	571	2130	1620		61.4	139	262	168	3060
DOC – A	5	3.11	4.055	2.63	**74.5**	**18.4**	**6.47**	1.4	**11.1**	**19.7**	**18.2**		3.32	3.82	**21.7**	2.77	**10.5**
Nitrate – H	10	0.154	2.6155	0.092	ND	ND	ND	0.109	0.232	ND	ND		0.048	0.044	0.068	0.072	ND
Nitrite – H	1	0.02	0.265	NT	<0.500	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
Sulphate – A	500	12.1	256.05	9.63	ND	5.62	1.47	10.4	ND	ND	ND		5.7	4.02	1.31	11.2	ND
TDS – A	500	168	334	133	**1760**	**370**	312	96	330	**1140**	**1010**		75	98	192	146	**2260**
TKN	-		-	0.205	144	0.711	0.91	0.096	1.79	1.62	2.2		0.518	1.5	1.66	0.824	4.36
pH	6.5-8.5	7.03	6.765-7.765	7.28	7.28	**8.36**	7.37	7.55	**7.81**	7.34	7.12		**6.61**	**6.62**	7.16	7.57	7.31
Total Phosphorus	-	0.39	2.50425	NT	0.248	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT

Notes: *A – Aesthetic, H –Health Related, OG – Operational Guideline, Cb – median value of all previous sampling events; ND – Not Detected, NT-Not Tested; Bold/shaded values exceed RU criteria.*

4.4.2 Geochemical Facies

Median concentrations of major ions were calculated using historical data for each groundwater monitoring location. A Piper diagram (Figure 2) was developed in order to identify waters which are geochemically similar in composition and thus may be identified as being from the same source or as being impacted by the same anthropogenic activity (e.g. landfilling). The ions used to develop the Piper diagram are: chloride, magnesium, sodium, potassium, calcium, sulphate, carbonate and bicarbonate. Data is available for each ion at each monitoring well.

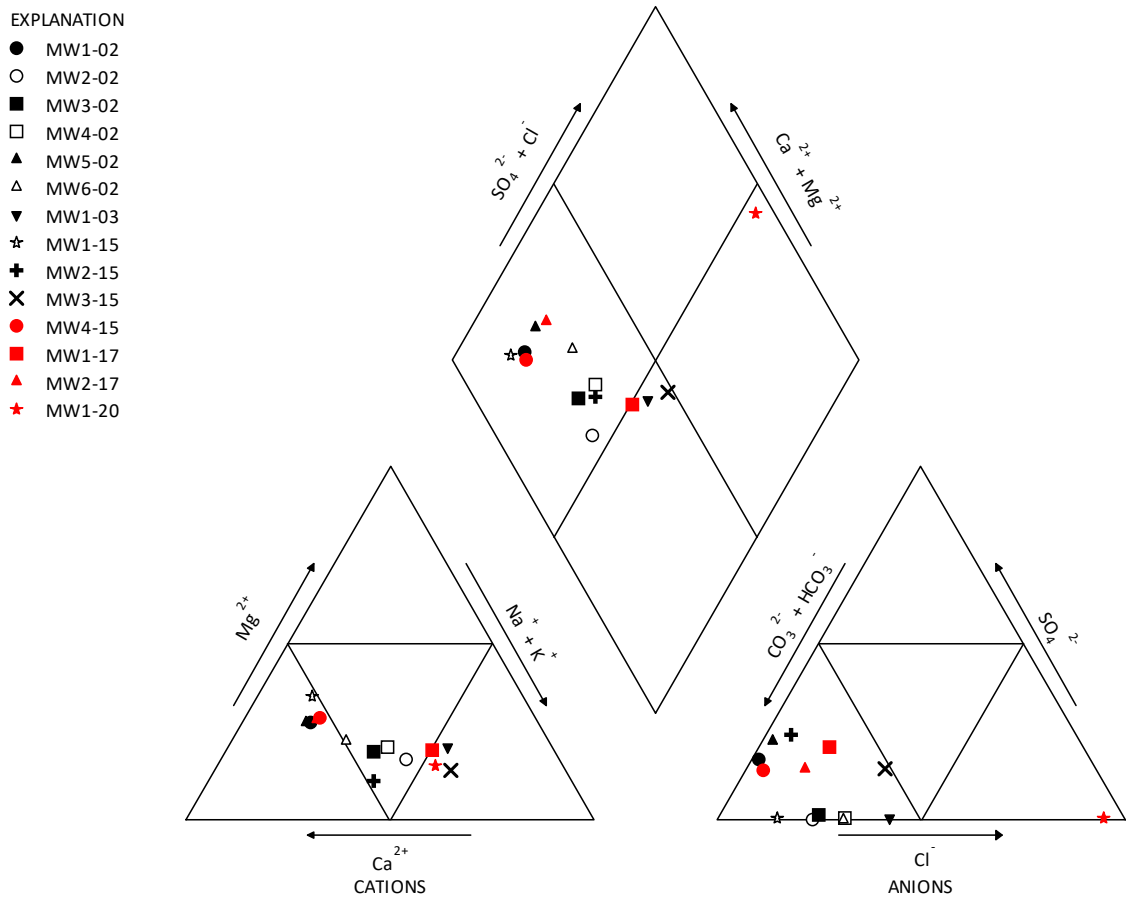


Figure 2: Monitoring Well Piper Diagram

The central diamond of the Piper diagram reveals a calcium-bicarbonate type grouping of wells similar to the source monitor (MW2-02) and a grouping similar to the background well (MW1-02). Three wells display either mixed water types, with one (MW1-20) clearly chloride type.

Similarly to historical reports, the clustering and relative positions of the data points shown on the Piper diagram suggests that the leachate impacted groundwater progressing in a southwesterly direction may be constrained between MW1-03 and MW3-15. The possible impact of highway salting on wells adjacent to the highway (especially MW1-20) is also revealed.

4.4.3 Leachate Characterization

Landfill leachates are typically strong, having TDS levels in the thousands of mg/L and complex mixtures of numerous contaminants that may have either leached from waste material or formed as a result of related reactions/processes. TDS levels at the Site have historically been shown to range from a low of 28mg/L at MW2-15 to a high of 2,580mg/L and MW2-02 (source well).

Representative ranges of typical contaminants found in landfill leachate are presented in Table 11.A, along with median values encountered at each of the monitoring well locations. The representative ranges in the table are associated with mature landfill sites (greater than 10 years old).

TABLE 11.A: COMPARISON OF MEDIAN MW CONCENTRATIONS TO RANGES OF TYPICAL LEACHATE PARAMETERS

Parameter	Monitoring Well (mg/L)														
	MW1-02 Background	MW 2-02 Source	MW 3-02	MW 4-02	MW 5-02	MW 6-02	MW 1-03	MW 1-15	MW 2-15	MW 3-15	MW 4-15	MW 1-17	MW 2-17	MW 1-20	Representative Range in Leachate
Potassium	1.57	**157.5**	29.35	11.1	1.35	4.175	29.1	3.98	0.291	0.378	0.661	1.16	0.846	1.84	50-400
Sodium	6.11	**176**	41.35	28	3.665	32.85	56.4	58.3	2.55	9.11	3.39	32.05	6.635	**303**	100-200
Calcium	20.3	**192**	62.4	31.05	13.85	54.25	30.25	**198.5**	2.83	3.92	9.49	16.65	18.5	**153**	100-400
Magnesium	6.02	**53.7**	16.3	9.515	4.06	14.65	14.9	**81.85**	0.394	1.18	3.16	6.78	5.94	45.8	50-200
Chloride	0.86	**229**	56.3	38.45	0.985	54.1	81.7	83.3	0.57	7.46	1.24	15.4	7.64	**830**	100-400
Sulphate	12.1	1.6	3.62	1	11.55	0.3	1.245	2.04	3.18	4.27	5.45	**24.4**	10.6	3	20-50
Alkalinity	74.0	**1270**	**296**	144	49.65	**206.5**	193	**842**	11.8	19.3	40.4	94.7	65.4	76	200-1,000
Iron	0.05	**70.0**	0.183	4.01	0.02	18.05	6.85	8.065	0.078	1.4	1.09	3.75	0.01	**20.8**	20-200
Nitrate	0.154	0.07	0.104	0.03	0.105	0.1	0.03	0.04	0.092	0.048	0.133	0.069	0.07	0.2	5-10
Ammonia-N	0.024	**80.5**	0.286	0.861	0.02	1.35	1.36	0.34	0.02	0.05	0.442	0.762	0.028	2	20-40
COD	10	**228.5**	62	27	10	42	85.3	**104.5**	53	64	33	**121.5**	70.5	73	100-500
Conductivity	169	2960	718	410	124	553	663.5	1620	36	76.7	96	271	168	2720	NP
TDS	168	1450	457	286.5	98	346	401	994.5	37	155	81	283	154.5	1620	5,000-40,000

Notes:
1. *Representative Ranges from "Integrated Solid Waste Management, Tchobangolous,1993".*
2. *Representative Range for TDS from "The Fate of Landfill Leachate in Waste Water Treatment Plants and in Groundwater at Attenuation Landfills, MOEE, 1994".*
3. *Bolded and shaded values fall within or above the representative range.*
4. *NP – Not Provided*

The representative ranges of typical contaminants found in landfill leachate are presented in Table 11.B and Table 11.C, along with the concentrations encountered at each of the monitoring well locations during the 2023 spring and fall sampling events. The representative ranges in the tables are associated with mature landfill sites (greater than 10 years old).

TABLE 11.B: SUMMARY OF TYPICAL LEACHATE PARAMETERS – JUNE 2023															
Parameter	**Monitoring Well (mg/L)**														
	ODWS	**MW 1-02 (BG)**	**MW 2-02 (Source)**	**MW 3-02**	**MW 4-02**	**MW 5-02**	**MW 6-02**	**MW 1-03**	**MW 1-15**	**MW 2-15**	**MW 3-15**	**MW 4-15**	**MW 1-17**	**MW 2-17**	**MW 1-20**	**Representative Range in Leachate**
Potassium		0.839	**164**	26.7	7.17	1.02	6.3	40.2	4.24	0.258	0.341	0.628	1.25	0.848	1.82	50-400
Sodium	200	4.27	**227**	38.3	28.1	3.41	30.3	**363**	65.2	1.67	8.44	3.51	19.3	13.1	326	100-200
Calcium		13.3	**166**	53.8	26.9	11.9	62.1	56.1	**205**	2.46	3.14	10.6	15	20.1	153	100-400
Magnesium		4.29	**70**	15.2	9.28	4.04	17.7	20.6	**83.1**	0.354	1.19	3.99	6.7	6.27	45.8	50-200
Chloride	250	0.74	**260**	42.6	38.4	1.1	60.1	**647**	82.6	ND	6.8	0.93	17.4	22.1	**899**	100-400
Sulphate	500	9.42	ND	1.09	ND	11.2	ND	ND	ND	3.18	6.82	4.24	18.1	11.2	ND	20-50
Alkalinity	500	56.7	**1580**	**285**	148	49.6	**270**	225	**834**	7.6	17	46.1	70.5	65.5	70.3	200-1,000
Iron	0.3	0.098	**52.9**	0.164	4.92	ND	19.9	15.2	12.5	0.018	2.5	1.86	6.15	ND	**26.2**	20-200
Nitrate	10	ND	ND	0.041	ND	0.105	0.056	ND	ND	ND	0.028	0.1	0.235	0.063	ND	5-10
Ammonia-N		0.0074	**119**	0.077	0.568	ND	1.63	1.28	0.678	ND	ND	0.132	0.476	ND	2	20-40
COD		42	**276**	51	46	ND	69	76	98	46	10	14	**130**	ND	47	100-500
Conductivity		128	3400	600	373	120	581	2310	1570	25	72.8	96	225	214	2840	NP
TDS	500	153	1570	374	233	89	348	1290	1000	33	94	73	266	158	1910	5,000-40,000

Notes:
1. *Representative Ranges from "Integrated Solid Waste Management, Tchobangolous,1993".*
2. *Representative Range for TDS from "The Fate of Landfill Leachate in Waste Water Treatment Plants and in Groundwater at Attenuation Landfills, MOEE, 1994"*
3. *ND- Not Detected, NT- No Test, NP – Not Provided*
4. *Bolded and shaded values fall within or above the representative range*

TABLE 11.B: SUMMARY OF TYPICAL LEACHATE PARAMETERS – OCTOBER 2023

Parameter	Monitoring Well (mg/L)															
	ODWS	MW 1-02 (BG)	MW 2-02 (Source)	MW 3-02	MW 4-02	MW 5-02	MW 6-02	MW 1-03	MW 1-15	MW 2-15	MW 3-15	MW 4-15	MW 1-17	MW 2-17	MW 1-20	Representative Range in Leachate
Potassium		NT	**178**	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT	50-400
Sodium	200	5.09	**285**	40.9	32.4	3.23	29.2	**326**	63.9		5.85	3.62	10.1	4.02	**330**	100-200
Calcium		17.1	**185**	54.6	30.5	12.3	54.5	48.9	**198**		2.88	12.8	23.8	18.7	172	100-400
Magnesium		4.81	**84.3**	14.4	9.27	3.83	15.4	15.8	**81.9**		0.91	5.52	9.76	5.72	48	50-200
Chloride	250	0.79	**255**	36.2	85.5	1.02	56.3	**543**	76.8		5.08	1.97	25.8	2.56	**910**	100-400
Sulphate	500	9.63	ND	5.62	1.47	10.4	ND	ND	ND	DRY WELL	5.7	4.02	1.31	11.2	ND	20-50
Alkalinity	500	68.1	**1680**	**257**	97	50.8	**223**	**214**	**850**		13.7	66	93.4	71.5	83.2	200-1,000
Iron	0.3	0.066	**62.2**	0.157	4.7	ND	14.9	10.8	12.3		0.398	9.83	14.4	ND	**24.1**	20-200
Nitrate	10	0.092	ND	ND	ND	0.109	0.232	ND	ND		0.048	0.044	0.068	0.072	ND	5-10
Ammonia-N		0.0059	132	0.0235	0.637	0.0133	1.36	0.937	0.842		0.0069	0.684	0.768	0.0107	2.3	20-40
COD		ND	**252**	43	34	ND	36	76	53		50	56	86	67	67	100-500
Conductivity		153	3670	582	475	124	571	2130	1620		61.4	139	262	168	3060	NP
TDS	500	133	1760	370	312	96	330	1140	1010		75	98	192	146	2260	5,000-40,000

Notes:
1. *Representative Ranges from "Integrated Solid Waste Management, Tchobangolous,1993".*
2. *Representative Range for TDS from "The Fate of Landfill Leachate in Waste Water Treatment Plants and in Groundwater at Attenuation Landfills, MOEE, 1994"*
3. *ND- Not Detected, NT- No Test, NP – Not Provided*
4. *Bolded and shaded values fall within or above the representative range*

Review of the data in Tables 11.A, 11.B and 11.C coupled with the observed TDS levels, suggests that the landfill is producing moderately strong leachate.

4.5 Surface Water Quantity Monitoring

Surface water flow measurements are not taken as part of the annual sampling events.

4.6 Surface Water Quality Monitoring

The surface water monitoring program evaluates the potential that landfill leachate and/or surface runoff from the Site may be impacting down gradient surface waters.

Previous assessments have concluded that:

1. Historic monitoring results for surface water samples collected southwest of the waste disposal site have demonstrated consistent water quality since 2004.

2. PWQO are commonly exceeded at SW1 (formerly SW) for boron, iron, zinc and phenols. PWQO have historically been exceeded for boron, iron and phenols at SW2 and SW4 and for iron and phenols at SW3, SW5, SW6 (background) and SW7.

Analytical results are summarized in Tables G.17 to G.19 of Appendix G and copies of laboratory certificates of analysis are presented in Appendix F. Surface water quality trends are also included in Charts H.7 – H.10 of Appendix H. The data in Table 12.A to 12.D presents a comparison of concentrations of surface water constituents to PWQO, Canadian Water Quality Guidelines (CWQG) and criteria listed under MECP's *Table A: Assessment Criteria for Waste Disposal Sites, Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water – Technical Guidance Document, 2010 (*AAC). The following observations are made on review of the results.

June 2023

- PWQO was exceeded for boron, iron, total phosphorus and phenols at SW1, SW2 and SW4; for iron, total phosphorus and phenols at SW6; for iron and total phosphorus at SW7; for lead at SW4 and SW7, and for copper, cadmium and zinc at SW7.
- AAC were exceeded for iron at SW1 and SW4 and for chloride and copper at SW7.
- CWQG were exceeded for un-ionized ammonia at SW1 and SW4; for nitrite at SW1; for iron at SW1, SW2, SW4, SW6 and SW7; for cadmium at SW4; and, for cadmium, chloride, copper, lead and zinc at SW7.

August 2023

- PWQO were exceeded for boron, iron and total phosphorus at SW2 and SW4; for iron, lead and total phosphorus at SW6 and SW7; for arsenic, cadmium, copper at SW7; for zinc at SW4 and SW7; and, phenols at SW4, SW6 and SW7.
- AAC were exceeded for un-ionized ammonia at SW4; for iron at SW4 and SW6; for cadmium, chloride, copper, lead and zinc at SW7.
- CWQG were exceeded for un-ionized ammonia and zinc at SW4; iron at SW2. SW4, SW6 and SW7; for lead at SW6 and SW7; and, for cadmium, chloride, copper and zinc at SW7.

September 2023

- PWQO were exceeded for boron, iron and total phosphorus at SW1, SW2 and SW4; for iron and total phosphorus at SW7; for lead, copper and zinc at SW4 and SW7; for cadmium at SW7; and for phenols at SW2, SW4 and SW7.
- AAC were exceeded for iron and lead at SW4; and, for cadmium, chloride, copper and zinc at SW7.
- CWQG were exceeded for un-ionized ammonia at SW1 and SW4; for iron at SW1, SW2, SW4 and SW7; for nitrite at SW1; for phenols at SW6; and, for cadmium, chloride, copper, lead and zinc at SW7.

October 2023

- PWQO were exceeded for boron, iron and total phosphorus at SW1, SW2 and SW4; for total phosphorus at SW6; for iron and total phosphorus at SW7; for cadmium, lead, copper and zinc at SW4; and, for phenols at SW1, SW2 and SW4.
- AAC were exceeded for iron at SW1 and SW4; for un-ionized ammonia, copper and lead at SW4; and, for chloride and iron at SW7.
- CWQG were exceeded for un-ionized ammonia at SW1 and SW4; for iron at SW2, SW4 and SW7; for cadmium, copper, lead and zinc at SW4; and, for chloride at SW7.

Surface water PWQO exceedances for the 2023 sampling events are tabulated graphically on Drawing B8 of Appendix B.

TABLE 12.A: SELECTED SURFACE WATER QUALITY DATA COMPARED WITH PWQO – JUNE 2023											
	Sampling Location and Concentration										
Parameter	**PWQO**	**Alternative Assessment Criteria**	**Units**	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**	**SW6**	**SW7**	**MW1-02 (Background Median)**
Chloride		180 (120)	mg/L	49.8	15.1		37.1		ND	**(244)**	0.87
Sulfate		100	mg/L	11.2	ND		ND		7.04	12.8	12.2
Phosphorus	0.01		mg/L	**0.0636**	**0.0151**		**0.148**		**0.068**	**0.369**	0.391
Un-ionized Ammonia		0.1 (0.019)	mg/L	**(0.819)**	0.0004		**(0.089)**		0	0.0005	0.0001
pH		6.0-9.0		8.48	8.24		8.08		7.62	7.31	7.02
Arsenic	0.005	0.15 (0.005)	mg/L	0.00054	0.00062		0.00108		0.001	0.00248	0.001
Barium		2.3	mg/L	0.0622	0.0159		0.091		0.00964	0.116	0.012
Boron	0.2	3.55 (1.5)	mg/L	**0.705**	**0.255**	DRY	**0.414**	DRY	0.018	0.042	0.024
Cadmium	0.0001	0.00021 (0.000017*)	mg/L	0.000012	ND		**(0.0000427)**		0.0000161	0.000105	0.0001
Chromium		0.064	mg/L	0.00083	0.00058		0.00114		0.00057	0.00314	0.00084
Iron	0.3	1 (0.3)	mg/L	**(3.2)***	**(0.308)**		**(14.6)***		**(0.414)**	**(28.6)***	0.05
Lead	0.001	0.002 (0.001)	mg/L	0.000305	0.00006		**(0.00143)**		0.00028	**(0.00118)**	0.001
Phenols	0.001	0.04 (0.004)	mg/L	**0.0023**	**0.0016**		**0.0023**		**0.0016**	ND	1.85
Zinc	0.02	0.089 (0.03**)	mg/L	0.0039	ND		0.0142		ND	**(0.064)**	0.009
Copper	0.005	0.0069 (0.002)	mg/L	0.00103	0.00069		0.00353		0.00184	**(0.00698)**	0.003
Nitrate		(13)	mg/L	0.644	ND		0.051		ND	ND	0.157
Nitrite		(0.06)	mg/L	**0.071**	ND		ND		ND	ND	0.02

( ) Standard in bracket applies to Canadian Water Quality Guideline criteria. () * and ()** - As hardness was not available for the June sampling event, standards taken from "*Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface water – Technical Guidance Document, MOE, 2010"*

Alternative assessment criteria from "*Table A: Assessment Criteria for Waste Disposal Sites Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface water – Technical Guidance Document, MOE, 2010"*

Bold and grey shaded values exceed PWQO; Bold and bracketed values exceed Canadian Water Quality Guidelines; Grey shaded * values exceed PWQO and Table A criteria; Grey shaded and bracketed values exceed PWQO and Canadian Water Quality Guidelines; Grey shaded, bracketed * values exceed PWQO, Table A and Canadian Water Quality Guidelines; Bold yellow shaded bracket values exceed Table A and Canadian Water Quality Guidelines.

Multiple PWQO exist where interim (revised) values are available based on the Hardness as CaCO3 (mg/L) result (i.e. cadmium, copper and lead)

ND – Not Detected; NT – Not Tested

TABLE 12.B: SELECTED SURFACE WATER QUALITY DATA COMPARED WITH PWQO – AUGUST 2023											
				Sampling Location and Concentration							
Parameter	**PWQO**	**Alternative Assessment Criteria**	**Units**	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**	**SW6**	**SW7**	**MW1-02 (Background Median)**
Chloride		180 (120)	mg/L		33.2		50.6		1.53	**(566)***	0.87
Sulfate		100	mg/L		ND		ND		2.1	ND	12.2
Phosphorus	0.01		mg/L		**0.0151**		**0.161**		**0.271**	**0.846**	0.391
Un-ionized Ammonia		0.1 (0.019)	mg/L		0.0004		**(0.1742)**		0.0011	0.0002	0.0001
pH		6.0-9.0			8.23		7.91		7.5	6.97	7.02
Arsenic	0.005	0.15 (0.005)	mg/L		0.00104		0.00156		0.00241	**(0.00584)**	0.001
Barium		2.3	mg/L		0.0265		0.158		0.0284	0.264	0.012
Boron	0.2	3.55 (1.5)	mg/L	DRY	**0.427**	DRY	**0.405**	DRY	0.029	ND	0.024
Cadmium	0.0001	0.00021 (0.00009*)	mg/L		0.0000083		0.0000237		0.0000558	**(0.000434)**	0.0001
Chromium		0.064	mg/L		0.00087		0.00132		0.00259	0.0275	0.00084
Iron	0.3	1 (0.3)	mg/L		**(0.38)**		**(18.8)***		**(2.63)***	**(40.4)***	0.05
Lead	0.001	0.002 (0.001)	mg/L		ND		0.000808		**(0.00138)**	**(0.0125)***	0.001
Phenols	0.001	0.04 (0.004)	mg/L		ND		**0.0028**		**0.0038**	**0.0031**	1.85
Zinc	0.02	0.089 (0.031**)	mg/L		ND		**(0.0104)**		0.0094	0.14	0.009
Copper	0.005	0.0069 (0.002)	mg/L		ND		0.00175		0.00168	**(0.0347)***	0.003
Nitrate		(13)	mg/L		0.021		ND		ND	ND	0.157
Nitrite		(0.06)	mg/L		ND		ND		ND	ND	0.02

( ) Standard in bracket applies to Canadian Water Quality Guideline criteria. () * and ()** - Standard dependent on lowest hardness value (49.1 mg/L at SW6) recorded for surface water during the August 2023 sampling event

Alternative assessment criteria from "*Table A: Assessment Criteria for Waste Disposal Sites Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface water – Technical Guidance Document, MOE, 2010*"

Bold and grey shaded values exceed PWQO; Bold and bracketed values exceed Canadian Water Quality Guidelines; Grey shaded * values exceed PWQO and Table A criteria; Grey shaded and bracketed values exceed PWQO and Canadian Water Quality Guidelines; Grey shaded, bracketed * values exceed PWQO, Table A and Canadian Water Quality Guidelines; Bold yellow shaded bracket values exceed Table A and Canadian Water Quality Guidelines.

Multiple PWQO exist where interim (revised) values are available based on the Hardness as CaCO3 (mg/L) result (i.e. cadmium, copper and lead)

ND – Not Detected; NT – Not Tested

TABLE 12.C: SELECTED SURFACE WATER QUALITY DATA COMPARED WITH PWQO – SEPTEMBER 2023											
				Sampling Location and Concentration							
Parameter	**PWQO**	**Alternative Assessment Criteria**	**Units**	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**	**SW6**	**SW7**	**MW1-02 (Background Median)**
Chloride		180 (120)	mg/L	102	34.8		36.3			**(394)**	0.86
Sulfate		100	mg/L	22.9	ND		12			23.8	12.1
Phosphorus	0.01		mg/L	**0.0294**	**0.0159**		**0.223**			**1.19**	0.39
Un-ionized Ammonia		0.1 (0.019)	mg/L	**(0.0235)**	0.0001		**(0.0415)**			0.0001	ND
pH		6.0-9.0		8.25	8.15		7.56			6.87	7.03
Arsenic	0.005	0.15 (0.005)	mg/L	0.00053	0.00083		0.0018			0.00469	0.001
Barium		2.3	mg/L	0.0849	0.0424		0.124			0.236	0.0119
Boron	0.2	3.55 (1.5)	mg/L	**1.14**	**0.515**		**0.523**			0.087	0.022
Cadmium	0.0001	0.00021 (0.00021*)	mg/L	0.0000054	ND	DRY	0.0000973	DRY	DRY	**(0.000373)***	0.0001
Chromium		0.064	mg/L	0.00058	0.00066		0.00369			0.0172	0.00076
Iron	0.3	1 (0.3)	mg/L	**(0.439)**	**(0.644)**		**(28.9)***			**(69.1)***	0.05
Lead	0.001	0.002 (0.001)	mg/L	ND	ND		**(0.00368)***			**(0.00749)***	0.001
Phenols	0.001	0.04 (0.004)	mg/L	ND	**(0.0044)**		0.0032			0.0028	1.7
Zinc	0.02	0.089 (0.079**)	mg/L	ND	ND		0.0381			**(0.21)***	0.0085
Copper	0.005	0.0069 (0.002)	mg/L	ND	ND		**(0.0076)**			**(0.0224)**	0.002
Nitrate		(13)	mg/L	0.112	ND		ND			ND	0.154
Nitrite		(0.06)	mg/L	0.191	ND		ND			ND	0.02

( ) Standard in bracket applies to Canadian Water Quality Guideline criteria. () * and ()** - Standard dependent on lowest hardness value (137 mg/L at SW4) recorded for surface water during the September 2023 sampling event

Alternative assessment criteria from "*Table A: Assessment Criteria for Waste Disposal Sites Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface water – Technical Guidance Document, MOE, 2010*"

Bold and grey shaded values exceed PWQO; Bold and bracketed values exceed Canadian Water Quality Guidelines; Grey shaded * values exceed PWQO and Table A criteria; Grey shaded and bracketed values exceed PWQO and Canadian Water Quality Guidelines; Grey shaded, bracketed * values exceed PWQO, Table A and Canadian Water Quality Guidelines; Bold yellow shaded bracket values exceed Table A and Canadian Water Quality Guidelines.

Multiple PWQO exist where interim (revised) values are available based on the Hardness as CaCO3 (mg/L) result (i.e. cadmium, copper and lead)

ND – Not Detected; NT – Not Tested

TABLE 12.D: SELECTED SURFACE WATER QUALITY DATA COMPARED WITH PWQO – OCTOBER 2023											
	Sampling Location and Concentration										
Parameter	**PWQO**	**Alternative Assessment Criteria**	**Units**	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**	**SW6**	**SW7**	**MW1-02 (Background Median)**
Chloride		180 (120)	mg/L	88.5	34.1		36.3		0.66	**(345)**	0.86
Sulfate		100	mg/L	11.5	0.46		17.7		28.9	59.8	12.1
Phosphorus	0.01		mg/L	**0.0197**	**0.0188**		**0.236**		**0.0494**	**0.0622**	0.39
Un-ionized Ammonia		0.1 (0.019)	mg/L	**(0.0935)**	0.0054		**(0.2458)**		0.0006	0.0007	ND
pH		6.0-9.0		8.28	8.47		8.21		7.55	7.84	7.03
Arsenic	0.005	0.15 (0.005)	mg/L	0.00037	0.0006		0.00178		0.00092	0.00046	0.001
Barium		2.3	mg/L	0.0703	0.0397		0.109		0.0113	0.094	0.0119
Boron	0.2	3.55 (1.5)	mg/L	**0.76**	**0.433**		**0.386**		0.022	0.051	0.022
Cadmium	0.0001	0.00021 (0.00009*)	mg/L	ND	ND	DRY	**(0.000125)**	DRY	0.0000055	0.0000129	0.0001
Chromium		0.064	mg/L	0.00058	0.00068		0.00446		ND	0.00119	0.00076
Iron	0.3	1 (0.3)	mg/L	**(1.42)***	**(0.631)**		**(43)***		**(0.246)**	**(3.76)***	0.05
Lead	0.001	0.002 (0.001)	mg/L	ND	0.000057		**(0.005)**		0.000182	0.000371	0.001
Phenols	0.001	0.04 (0.004)	mg/L	0.0019	0.002		0.0019		ND	ND	1.7
Zinc	0.02	0.089 (0.030**)	mg/L	ND	ND		**(0.0526)**		ND	0.0145	0.0085
Copper	0.005	0.0069 (0.002)	mg/L	0.00054	ND		**(0.0104)***		0.00075	0.0013	0.002
Nitrate		(13)	mg/L	0.378	0.021		0.153		ND	ND	0.154
Nitrite		(0.06)	mg/L	ND	ND		0.055		ND	ND	0.02

( ) Standard in bracket applies to Canadian Water Quality Guideline criteria. () * and ()** - Standard dependent on lowest hardness value (53.5 mg/L at SW6) recorded for surface water during the October 2023 sampling event

Alternative assessment criteria from "*Table A: Assessment Criteria for Waste Disposal Sites Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface water – Technical Guidance Document, MOE, 2010*"

Bold and grey shaded values exceed PWQO; Bold and bracketed values exceed Canadian Water Quality Guidelines; Grey shaded * values exceed PWQO and Table A criteria; Grey shaded and bracketed values exceed PWQO and Canadian Water Quality Guidelines; Grey shaded, bracketed * values exceed PWQO, Table A and Canadian Water Quality Guidelines; Bold yellow shaded bracket values exceed Table A and Canadian Water Quality Guidelines.

Multiple PWQO exist where interim (revised) values are available based on the Hardness as CaCO3 (mg/L) result (i.e. cadmium, copper and lead)

ND – Not Detected; NT – Not Tested

4.7 Gas Pressures and Composition

Gas pressures and composition data is not currently collected at the Site.

4.8 Supplemental Monitoring

No supplemental monitoring is performed at the Site.

4.9 Control Systems Monitoring

The current environmental control systems in place at the Site are the application of cover material as well as proper grading of the fill area of the landfill.

5.0 ASSESSMENT, INTERPRETATION AND DISCUSSION

Section 5.0 provides an assessment, interpretation and discussion regarding the potential impact from the landfill on groundwater and surface water features considering information collected during the 2022 groundwater and surface water sampling program, as well as a review of historical data. The effectiveness of the monitoring program, remedial measures in place, site features, control measures/systems in place and operating conditions at the landfill site are also assessed.

5.1 Groundwater Flow Interpretation

Interpretations presented in previous assessments indicate that groundwater within the overburden aquifer at the Site flows toward the northwest and southwest, eventually discharging into Lake Huron. Groundwater contours interpreted from water table elevations determined during the 2023 spring and fall sampling events are shown on Drawings B5 and B6, of Appendix B. The 2023 contours support the historical interpretations regarding groundwater flow direction; it is suspected that a groundwater divide restricts flow in the northwesterly and westerly directions.

Goffco Limited identified a hydraulic conductivity (K) of $1.0x10^{-6}$ m/s (clean sand) in their 2003 report titled “Hydrogeological Investigation – Town of Blind River Landfill”. The porosity of the soils is assumed to be in the range of 30% based on previous hydrogeological assessments on similar material.

Based on the identified hydraulic conductivity and porosity, an estimated lateral gradient for the Site was developed in order to calculate groundwater flow velocities for the spring and fall sampling events. Drawing B4 of this report was referenced in order to determine the groundwater gradient according to the 2023 spring and fall sampling events.

For the spring sampling event, the hydraulic gradient between MW2-02 and MW6-02 was calculated to be 0.025 m/m. Using the identified hydraulic conductivity and porosity, the estimated groundwater flow velocity was calculated to be 2.67 meters/year (m/yr). Gradient and velocity values associated with the fall sampling event are 0.026 m/m and 2.69 m/y.

At the vertical gradient of 0.03 observed during the fall 2023 sampling event at the nested monitoring well locations MW3-02 and MW6-02, the groundwater velocity was determined to be 0.04 m/yr at a hydraulic conductivity of 1 order of magnitude less than that used for the lateral gradient calculation.

At the calculated horizontal and vertical groundwater velocities, precipitation (or leachate) reaching the underlying groundwater system is expected to travel for decades before reaching the Highway 17 right-of-way (ROW) and eventually discharging to Lake Huron.

5.2 Groundwater and Surface Water Quality

The Tables in Appendix G present summaries of analytical results from analyses of the groundwater and surface water samples collected during the reporting period and previous years. ODWS and PWQO are noted where they exist. The comments below have been developed following review of the latest set of groundwater and surface water analytical data.

1. The Site appears to be producing moderately strong leachate;

2. During the spring sampling event, no parameters exceeded ODWS at MW1-02 (background). RU criteria was exceeded for DOC at this location during the spring sampling event;

3. ODWS were exceeded for alkalinity, chloride, iron, manganese, sodium, TDS, DOC and benzene at MW2-02 (source) during the spring and fall sampling events. RU concentrations were also exceeded for alkalinity, barium, boron, chloride, iron, manganese, sodium, TDS, benzene and DOC during the spring and fall sampling events;

4. PWQO were exceeded during the June sampling event for boron (SW1, SW2, SW3), iron (all sampled surface water sampling locations) total phosphorus (all sampled surface water locations), phenols (SW1, SW2, SW4, SW6), lead (SW4, SW7), copper (SW7), cadmium (SW7) and zinc (SW7);

5. AAC were exceeded during the June sampling event for iron (SW1, SW4), chloride (SW7) and copper (SW7);

6. CWQG were exceeded during the June sampling event for un-ionized ammonia (SW1, SW4), nitrite (SW1), cadmium (SW4), cadmium (SW7), chloride (SW7), copper (SW7), lead (SW7 and zinc (SW7);

7. PWQO were exceeded during the August sampling event for boron (SW2, SW4), iron (all sampled surface water locations), total phosphorus (all sampled surface water locations), lead (SW6, SW7), arsenic (SW7), cadmium (SW7), copper (SW7) and zinc (SW7) and phenols (SW4, SW6, SW7).

8. AAC were exceeded during the August sampling event for un-ionized ammonia (SW4), iron (SW4, SW6), cadmium (SW7), chloride (SW7), copper (SW7), lead (SW7) and zinc (SW7);

9. CWQG were exceeded during the August sampling event for un-ionized ammonia (SW4), zinc (SW4, SW7), lead (SW6, SW7), cadmium (SW7), chloride (SW7) and copper (SW7);

10. PWQO were exceeded during the September sampling event for boron (SW1, SW2, SW4), iron (SW1, SW2, SW4, SW7), total phosphorus (SW1, SW2, SW4, SW7), lead, (SW4, SW7), copper (SW4, SW7), zinc (SW4, SW7), cadmium (SW7) and phenols (SW2, SW4, SW7);

11. AAC were exceeded during the September sampling event for iron (SW4), lead (SW4), cadmium (SW7), chloride (SW7), copper (SW7) and zinc (SW7);

12. CWQG were exceeded during the September sampling event for un-ionized ammonia (SW1, SW4), nitrite (SW1), phenols (SW6), cadmium (SW7), chloride (SW7), copper (SW7), copper (SW7), lead (SW7) and zinc (SW7);

13. PWQO were exceeded during the October sampling event for boron (SW1, SW2, SW4), iron (SW1, SW2, SW4, SW7), total phosphorus (SW1, SW2, SW4, SW7), cadmium (SW4), lead (SW4), copper, (SW4), zinc (SW4) and phenols (SW1, SW2, SW4).

14. AAC were exceeded during the October sampling event for iron (SW1, SW4, SW7), un-ionized ammonia (SW4), copper (SW4), lead (SW4) and chloride (SW7);

15. CWQG were exceeded during the October sampling event for un-ionized ammonia (SW1, SW4), cadmium (SW4), copper (SW4), lead (SW4), zinc (SW4) and chloride (SW7).

16. SW3 and SW5 were dry during the 2023 spring and fall sampling events;

17. Water quality of SW1, located southwest of the fill area and SW4, located south of the fill area appear to have been impacted by leachate throughout the period that data is available.

18. Water quality monitoring should continue to be carried out four times annually, as required under ECA No. A-500-7134513066.

Groundwater and surface water quality trend plots are included in Appendix H of this report. While no significant trends are apparent in data from individual monitoring wells:

1. Concentrations of iron and manganese are typically higher at MW4-02, MW6-02, MW1-03, MW1-17 and MW1-20;

2. Concentrations of DOC, TDS and chloride are typically greatest at MW1-03, followed by MW6-02 and MW4-02. Although data is limited, concentrations of these parameters appear to be similar to or greater at MW1-20 than those observed at MW1-03;

3. With the exception of the fall 2020 sampling event where MW1-02 shows elevated levels of certain parameters, for reasons unknown, MW1-02 and MW5-02 consistently plot as the lowest concentrations for the selected parameters mentioned above.

5.2.1 Leachate Generation Rate

It is anticipated that, locally, the entire water surplus would infiltrate into the groundwater system. Based on an annual infiltration of 250mm (per MECP guidance) through 2.0 hectares (approved fill area), it is estimated that 13.7m^3/day of leachate may be produced at the Site.

5.3 Waste Disposal Site Gas impacts

Landfill gas is not currently monitored; however, it is expected that the anticipated small quantities of methane gas produced will not impact adjacent properties. The existing cover at the Site does not show signs of failure. There appears to be ample vegetation growth on all outer slopes as well as historic dumping areas within the current landfill.

5.4 Effectiveness of Engineered Controls

There are no engineered control systems currently in place at the Site.

5.5 Adequacy of the Monitoring Program

The groundwater and surface water monitoring program appear to adequately characterize current conditions at the Site, however, to further assess the extent of leachate migration, the Town has been corresponding with the MECP regarding additional monitoring locations.

5.6 Assessment of the Need for Implementation of Contingency Measures

A trigger mechanisms and contingency plan is currently being finalized for the Site, however, to further assess the results from the analysis of groundwater collected at the site, a list of trigger parameters and concentrations was developed starting in 2015 and continued during the 2023 reporting period.

5.6.1 Trigger Mechanisms Assessment

A list of groundwater trigger parameters was established as being those parameters where the ratio between the median concentrations in leachate and background water quality is 10 or greater. The source (leachate) monitor constructed at the Site is identified as MW2-02 while the background monitor is identified as MW1-02. The ratios of concentrations in groundwater from these two (2) active monitoring wells were determined in identifying the trigger parameters (as shown in Tables 12.A and 12.B).

Site-specific groundwater trigger concentrations, developed based on MECP's RU Policy were established for each of the trigger parameters identified in Table 13.A and 13.B, as the 75th percentile RU values. The trigger concentrations were calculated using the 10 most recent sampling results. The trigger concentrations are also shown in Table 13.A and 13.B.

The assessment of groundwater trigger mechanisms reveals:

1. Trigger concentration for DOC was exceeded at MW3-02, MW4-02, MW6-02, MW1-03, MW1-15, and MW1-17 and MW1-20 during the 2022 spring and fall sampling events. DOC also exceeded trigger concentrations at MW3-15 during the spring sampling event;

2. During both spring and fall sampling events, iron exceeded trigger concentrations at MW4-02, MW1-03, MW1-15, MW3-15, MW4-15, MW1-17 and MW1-20. Tigger concentrations for iron were also exceeded at MW3-02 during the spring sampling event;

3. MW1-03 and MW1-20 exceeded trigger concentrations for chloride, barium and sodium during the spring and fall sampling events; and,

4. Alkalinity exceeded trigger concentrations at MW1-15 during the spring and fall sampling events and at MW3-02 during the fall sampling event.

As proposed in the Site's Trigger Mechanism and Contingency Plan, in addition to the assessment described above, groundwater quality near the point of discharge to surface water (MW1-20) was assessed considering compliance with background concentrations as well as PWQO or the CWQG, whichever is more recently published (as shown in Table 14).

To address the noted trigger concentration exceedances, the Town is pursuing the establishment of a contaminant attenuation zone (CAZ).

TABLE 13.A: GROUNDWATER TRIGGER MECHANISM ASSESSMENT

Parameter	Ratio to Background MW2-02	Trigger Conc. (mg/L)	2023 Spring Sampling Event Monitoring Well Results (mg/L)												
			MW 1-02	MW 3-02*	MW 4-02*	MW 5-02	MW 6-02*	MW 1-03*	MW 1-15	MW 2-15	MW 3-15*	MW 4-15	MW 1-17*	MW 2-17*	MW 1-20
Alkalinity	17.16	287	56.7	285	148	49.6	270	225	**834**	7.6	17	46.1	70.5	65.5	70.3
Barium	37.82	0.2590	0.0074	0.0152	0.0549	0.00675	0.226	**0.375**	0.175	0.016	0.00595	0.0076	0.0257	0.0133	**0.277**
Boron	68.64	1.2856	ND	0.437	0.086	ND	0.118	0.248	**1.55**	ND	0.199	0.01	0.023	ND	ND
Chloride	266.28	125.44	0.74	42.6	38.4	1.1	60.1	**647**	82.6	ND	6.8	0.93	17.4	22.1	**899**
Iron	1400	0.1750	0.098	0.164	**4.92**	ND	**19.9**	**15.2**	**12.5**	0.018	**2.5**	**1.86**	**6.15**	ND	**26.2**
Sodium	28.81	103.09	4.27	38.3	28.1	3.41	30.3	**363**	65.2	1.67	8.44	3.51	19.3	13.1	**326**
DOC	19.61	4.0288	**4.42**	**15.6**	**6.4**	1.85	**11.6**	**17.4**	**17.6**	2.78	3.85	2.9	**15.4**	2.72	**9.74**

*Denotes a boundary well
Grey shaded values exceed Trigger Concentrations
NA – Not Available; ND – Not Detected; NT – Not Tested

TABLE 13.B: GROUNDWATER TRIGGER MECHANISM ASSESSMENT

Parameter	Ratio to Background MW2-02	Trigger Conc. (mg/L)	2023 Fall Sampling Event Monitoring Well Results (mg/L)												
			MW 1-02	MW 3-02*	MW 4-02*	MW 5-02	MW 6-02*	MW 1-03*	MW 1-15	MW 2-15	MW 3-15*	MW 4-15	MW 1-17*	MW 2-17*	MW 1-20
Alkalinity	17.16	287	68.1	257	97	50.8	223	214	**850**	DRY	13.7	66	93.4	71.5	83.2
Barium	37.82	0.2589	0.0097	0.0144	0.0637	0.00736	0.182	**0.321**	0.212		0.0051	0.0125	0.0396	0.0115	**0.403**
Boron	68.64	1.2781	0.018	0.54	0.091	ND	0.144	0.28	**1.41**		0.123	0.028	0.039	0.013	0.015
Chloride	266.28	125.43	0.79	36.2	85.5	1.02	56.3	**543**	76.8		5.08	1.97	25.8	2.56	**910**
Iron	1400	0.1750	0.066	0.157	**4.7**	ND	**14.9**	**10.8**	**12.3**		**0.398**	**9.83**	**14.4**	ND	**24.1**
Sodium	28.81	103.07	5.09	40.9	32.4	3.23	29.2	**326**	63.9		5.85	3.62	10.1	4.02	**330**
DOC	19.61	4.0550	2.63	**18.4**	**6.47**	1.4	11.1	**19.7**	**18.2**		3.32	3.82	**21.7**	2.77	**10.5**

*Denotes a boundary well
Grey shaded values exceed Trigger Concentrations
NA – Not Available; ND – Not Detected; NT – Not Tested

TABLE 14: WETLAND MONITORING WELL COMPARISON TO SURFACE WATER TRIGGER PARAMETERS

Parameter	ODWS (mg/L)	SW6 (mg/L)		PWQO (mg/L)	CWQG (mg/L)	MW1-20 (mg/L)		MW1-03 (mg/L)	
		SPRING	FALL			SPRING	FALL	SPRING	FALL
Un-ionized Ammonia		0	0.0006		0.019	0.0004	0.0012	0.0002	0.0006
pH		7.62	7.55	6.5 – 8.5	6.5 - 9	7.27	7.31	7.36	7.34
Chloride	250	ND	0.66		120	**899**	**910**	**647**	**543**
Fluoride	1.5	NT	NT		0.12	ND	ND	ND	ND
Total Phosphorus		0.068	0.0494	0.01		**8.13**	NT	**0.334**	NT
Cyanide	0.2	NT	NT	0.005		ND	ND	ND	ND
Arsenic	0.025	0.001	0.00092	0.005	0.005	**0.0194**	**00431**	NT	0.00097
Barium	1	0.00964	0.0113			0.958	1.97	NT	0.332
Boron	5	0.018	0.022	0.2	1.5	ND	0.056	NT	**0.305**
Cadmium	0.005	0.0000161	0.0000558	0.0001	0.000017*/0.00009*	**0.000565**	**0.0014**	NT	**0.0000778**
Copper	1	0.00184	0.00075	0.001	0.002	**0.1**	**0.422**	NT	**0.00398**
Iron	0.3	0.414	2.63	0.3	0.3	**83**	**222**	NT	**13.5**
Lead	0.01	0.00028	0.00138	0.001	0.001	**0.0688**	**0.149**	NT	**0.00126**
Zinc	5	ND	ND	0.02	0.03*/0.03*	**0.146**	**0.38**	NT	0.0073
Phenols		0.0016	ND	0.001	0.004	0.0015	NT	ND	NT

* Dependent on hardness value (mg/L as CaCO3); Metals reported for MW1-20 and MW1-03 are total metals (mg/L)
ND – Not Detected; NT – Not Tested
Bold and shaded values exceed trigger
Trigger parameters are those described in Schedule 3 or the ECA; Trigger values are considered PWQO/CWQG values.

During the spring and fall sampling events, trigger concentrations were exceeded at MW1-20 for chloride, arsenic, cadmium, copper, iron, lead and zinc. Trigger concentrations were also exceeded for total phosphorus during the spring sampling event. During the spring and fall sampling events, trigger concentrations were exceeded for chloride at MW1-03. MW1-03 also exceeded trigger concentrations for total phosphorus during the spring sampling event and boron, cadmium, copper, iron and lead during the fall sampling event.

5.6.2 Surface Water Trigger Assessment

A list of surface water trigger parameters was established as those parameters listed under Column 3 or Schedule 5 of the MECP Landfill Standards.

As specified in the Trigger Mechanisms and Contingency Plan developed for the site, trigger concentrations are equivalent to the 75th percentile values calculated using the 10 most recent background surface water quality sample results from the upstream sampling locations (SW6). As data is only available for two sampling events at SW6, trigger concentrations may not accurately represent background conditions.

Established trigger concentrations for the 2023 reporting period are shown in Tables 15.A, 15.B, 15.C and 15.D.

TABLE 15.A: SURFACE WATER TRIGGER MECHANISMS ASSESSMENT –JUNE 2023

Parameter	Trigger Concentration Using SW6 (mg/L)	Concentrations (mg/L)						
		SW1	SW2	SW3	SW4	SW5	SW6	SW7
Alkalinity	41.7	**373**	**123**		**304**		36.1	**85.3**
Ammonia	0.048	**4.65**	0.0152		**9.79**		0.024	**0.073**
Un-ionized Ammonia	0.0001	**0.0819**	**0.0004**		**0.089**		0	**0.0005**
Arsenic	0.001795	0.00054	0.00062		0.00108		0.001	**0.00248**
Barium	0.03025	**0.0622**	0.0159		**0.091**		0.00964	**0.116**
Boron	0.01725	**0.705**	**0.255**		**0.414**		**0.018**	**0.042**
Cadmium	0.00004615	0.000012	ND		0.0000427		0.0000161	**0.000105**
Chloride	1.0625	**49.8**	**15.1**		**37.1**		ND	**244**
Chromium	0.00159	0.00083	0.00058		0.00114		0.00057	**0.00314**
Conductivity	93.2	**810**	**273**		**642**		86.9	**926**
Copper	0.00207	0.00103	0.00069		**0.00353**		0.00184	**0.00698**
Iron	1.785	**3.2**	0.308		**14.6**		0.414	**28.6**
Lead	0.0012185	0.000305	0.00006		**0.00143**		0.00028	0.00118
Mercury	ND	ND	ND		ND		ND	ND
Nitrate	ND	0.644	ND	DRY	0.051	DRY	ND	ND
Nitrite	ND	0.071	ND		ND		ND	ND
TKN	2.495	**5.55**	0.768		**11.9**		1.97	2
pH	7.66	**8.48**	**8.24**		**8.08**		7.62	7.31
Total Phosphorus	0.1421	0.0636	0.0151		**0.148**		0.068	**0.369**
Total Suspended Solids	16	**53.5**	11.1		**250**		3.7	**1530**
Total Dissolved Solids	72.75	**521**	**200**		**366**		**91**	**524**
Sulphate	6.04	**11.2**	ND		ND		**7.04**	**12.8**
Zinc	0.009575	0.0039	ND		**0.0142**		ND	**0.064**
BOD	10.95	**12.8**	ND		**16.4**		ND	**37.9**
COD	77	61	52		75		48	48
Phenol	0.0018	**0.0023**	0.0016		**0.0023**		0.0016	ND
Field pH	6.89	**7.58**	**7.82**		**7.35**		6.53	**7.38**
Field Dissolved Oxygen	137.95	**142.1**	114		70.5		**150.9**	39.8
Field Conductivity	0.1035	**0.802**	**0.301**		**0.674**		0.093	**0.958**
Field Temperature	22.55	22.4	**25.4**		20.6		**23.5**	16.6

ND – Not Detected; NA – Not Available; BOD – Biological Oxygen Demand; COD – Chemical Oxygen Demand; TKN – Total Kjeldahl Nitrogen
Bold and shaded values exceed trigger concentrations.

TABLE 15.B: SURFACE WATER TRIGGER MECHANISMS ASSESSMENT –AUGUST 2023

Parameter	Trigger Concentration Using SW6 (mg/L)	Concentrations (mg/L)						
		SW1	SW2	SW3	SW4	SW5	SW6	SW7
Alkalinity	47.925		**212**		**249**		**49.8**	**136**
Ammonia	0.037425		0.0074		**5.14**		0.0259	**0.126**
Un-ionized Ammonia	0.000425		0.0004		**0.1742**		**0.0011**	0.0002
Arsenic	0.00243		0.00104		0.00156		0.00241	**0.00584**
Barium	0.03315		0.0265		**0.158**		0.0284	**0.264**
Boron	0.0235		**0.427**		**0.405**		**0.029**	ND
Cadmium	0.0000598		0.0000083		0.0000237		0.0000558	**0.000434**
Chloride	1.4		**33.2**		**50.6**		**1.53**	**566**
Chromium	0.0025		0.00087		0.00132		**0.00259**	**0.0275**
Conductivity	101.375		**496**		**612**		**107**	**2010**
Copper	0.001955		ND		0.00175		0.00168	**0.0347**
Iron	2.2925		0.38		**18.8**		**2.63**	**40.4**
Lead	0.001555		ND		0.000808		0.00138	**0.0125**
Mercury	0.0000068		ND		ND		0.0000068	**0.0000296**
Nitrate	ND	DRY	0.021	DRY	ND	DRY	ND	ND
Nitrite	ND		ND		ND		ND	ND
TKN	3.0825		1.11		**8.45**		**3.27**	**9.04**
pH	7.64		**8.23**		**7.91**		7.5	6.97
Total Phosphorus	0.21925		0.0151		0.161		**0.271**	**0.846**
Total Suspended Solids	50.65		5.7		**76.1**		**148**	**7300**
Total Dissolved Solids	93.5		**329**		**429**		**101**	**1220**
Sulphate	5.04		ND		ND		2.1	ND
Zinc	0.0104		ND		0.0104		0.0094	**0.14**
BOD	10.2		2.5		8.9		6.6	**80.6**
COD	98.5		64		**178**		**109**	**401**
Phenol	0.00245		ND		**0.0028**		**0.0038**	**0.0031**
Field pH	7.2475		**8.01**		**7.65**		**7.96**	7
Field Dissolved Oxygen	131.475		95.9		82.7		101.4	77.7
Field Conductivity	0.1335		**0.494**		**0.593**		**0.192**	**1.815**
Field Temperature	22.975		**25.4**		**28.9**		22.8	**25.7**

ND – Not Detected; NA – Not Available; BOD – Biological Oxygen Demand; COD – Chemical Oxygen Demand; TKN – Total Kjeldahl Nitrogen
Bold and shaded values exceed trigger concentrations.

TABLE 15.C: SURFACE WATER TRIGGER MECHANISMS ASSESSMENT –SEPTEMBER 2023

Parameter	Trigger Concentration Using SW6 (mg/L)	Concentrations (mg/L)						
		SW1	SW2	SW3	SW4	SW5	SW6	SW7
Alkalinity	47.925	**414**	**243**		**164**			**84.7**
Ammonia	0.037425	**2.7**	0.0096		**4.4**			0.0338
Un-ionized Ammonia	0.000425	**0.0235**	0.0001		**0.0415**			0.0001
Arsenic	0.00243	0.00053	0.00083		0.0018			**0.00469**
Barium	0.03315	**0.0849**	**0.0424**		**0.124**			**0.236**
Boron	0.0235	**1.14**	**0.515**		**0.523**			**0.087**
Cadmium	0.0000598	0.0000054	ND		**0.0000973**			**0.000373**
Chloride	1.4	**102**	**34.8**		**36.3**			**394**
Chromium	0.0025	0.00058	0.00066		**0.00369**			**0.0172**
Conductivity	101.375	**1090**	**548**		**438**			**1430**
Copper	0.001955	ND	ND		**0.0076**			**0.0224**
Iron	2.2925	0.439	0.644		**28.9**			**69.1**
Lead	0.001555	ND	ND		**0.00368**			**0.00749**
Mercury	0.0000068	ND	ND		ND			**0.000074**
Nitrate	ND	0.112	ND	DRY	ND	DRY	DRY	ND
Nitrite	ND	0.191	ND		ND			ND
TKN	3.0825	**4.04**	0.782		**7.09**			**5.68**
pH	7.64	**8.25**	**8.15**		7.56			6.87
Total Phosphorus	0.21925	0.0294	0.0159		**0.223**			**1.19**
Total Suspended Solids	50.65	14.2	9.4		**1180**			**6180**
Total Dissolved Solids	93.5	**659**	**358**		**286**			**919**
Sulphate	5.04	**22.9**	ND		**12**			**23.8**
Zinc	0.0104	ND	ND		**0.0381**			**0.21**
BOD	10.2	2.5	2		**27**			**70.9**
COD	98.5	73	51		**170**			**287**
Phenol	0.00245	ND	**0.0044**		**0.0032**			**0.0028**
Field pH	7.2475	**7.39**	**7.38**		**7.42**			6.76
Field Dissolved Oxygen	131.475	92.6	94.5		54.5			30.1
Field Conductivity	0.1335	**1.047**	**0.536**		**0.462**			**1.28**
Field Temperature	22.975	18.9	19.5		19			19.9

ND – Not Detected; NA – Not Available; BOD – Biological Oxygen Demand; COD – Chemical Oxygen Demand; TKN – Total Kjeldahl Nitrogen
Bold and shaded values exceed trigger concentrations.

TABLE 15.D: SURFACE WATER TRIGGER MECHANISMS ASSESSMENT –OCTOBER 2023

Parameter	Trigger Concentration Using SW6 (mg/L)	Concentrations (mg/L)						
		SW1	SW2	SW3	SW4	SW5	SW6	SW7
Alkalinity	47.3	**412**	**241**		**191**		31	**65**
Ammonia	0.0259	**7.13**	**0.298**		**8.47**		0.0227	**0.0405**
Un-ionized Ammonia	0.0006	**0.0935**	**0.0054**		**0.2458**		0.0006	**0.0007**
Arsenic	0.00241	0.00037	0.0006		0.00178		0.00092	0.00046
Barium	0.0284	**0.0703**	**0.0397**		**0.109**		0.0113	**0.094**
Boron	0.02375	**0.76**	**0.433**		**0.386**		0.022	**0.051**
Cadmium	0.0000558	ND	ND		**0.000125**		0.0000055	0.0000129
Chloride	1.335	**88.5**	**34.1**		**36.3**		0.66	**345**
Chromium	0.0025	0.00058	0.00068		**0.00446**		ND	0.00119
Conductivity	107	**1060**	**550**		**514**		**133**	**1430**
Copper	0.00184	0.00054	ND		**0.0104**		0.00075	0.0013
Iron	2.18	1.42	0.631		**43**		0.246	**3.76**
Lead	0.00138	ND	0.000057		**0.005**		0.000182	0.000371
Mercury	0.0000068	ND	ND		ND		ND	ND
Nitrate	ND	0.378	0.021	DRY	0.153	DRY	ND	ND
Nitrite	ND	ND	ND		0.055		ND	ND
TKN	3.02	**6.82**	0.836		**12.7**		0.984	0.66
pH	7.62	**8.28**	**8.47**		**8.21**		7.55	**7.84**
Total Phosphorus	0.202	0.0197	0.0188		**0.236**		0.0494	0.0622
Total Suspended Solids	18.2	15.5	16.3		**379**		15.4	**27.6**
Total Dissolved Solids	99	**612**	**328**		**293**		99	**834**
Sulphate	12.505	11.5	0.46		**17.7**		**28.9**	**59.8**
Zinc	0.0104	ND	ND		**0.0526**		ND	**0.0145**
BOD	10.2	2.3	2.8		**23.8**		ND	ND
COD	95	20.8	19.1		30.4		18.7	8.74
Phenol	0.00245	0.0019	0.002		0.0019		ND	ND
Field pH	7.96	7.79	7.92		**8.07**		**8.1**	7.83
Field Dissolved Oxygen	125	99.6	102.9		105.7		99.6	104.9
Field Conductivity	0.157	**1.032**	**0.54**		**0.498**		0.157	**1.237**
Field Temperature	22.8	12.4	12.7		14.5		11.3	14.2

ND – Not Detected; NA – Not Available; BOD – Biological Oxygen Demand; COD – Chemical Oxygen Demand; TKN – Total Kjeldahl Nitrogen
Bold and shaded values exceed trigger concentrations.

5.6.3 Contingency Measures

Monitoring wells assessed to-date are intermediate wells in close proximity to the fill area, rather than CAZ boundary wells. In accordance with direction from the MECP, the Town has initiated the process to formally establish a CAZ. The Town has also submitted an easement application with MTO requesting that groundwater beneath the Highway 17 ROW be incorporated into the CAZ.

In accordance with ECA A-500-7134513066, the Town is also constructing improvements to site and local area surface water management facilities. This includes addressing suspected leachate seeps.

6.0 ADDITIONAL ANNUAL REPORTING REQUIREMENTS

Section 1.4 of this report outlines the annual reporting requirements for the Town of Blind River Municipal landfill site. The following subsections address the two requirements not addressed earlier in this document.

6.1 Site Plan – 2023 Contours and Areas of Operation

Drawing B2 in Appendix B depicts the following information as per the requirements reproduced in Section 1.4 of this report:

1. 2023 contours and facilities;
2. Areas of landfilling activity (2023 and intended for 2024); and,
3. Progress of final cover.

6.2 Site Capacity

A topographic survey was completed on October 5, 2023 in order to estimate the in-situ waste volume. A contour plan of the active landfill area was completed based on this survey (Drawing B2 in Appendix B) and was subsequently compared to a site survey conducted on November 2, 2022. The comparison indicates that during this period, approximately 3,302 m^3 of waste and cover material were deposited within the approved fill area. This equates to an annual disposal rate of approximately 3,566 m3/year.

Available site capacity was determined by overlaying the anticipated final contours over the October 2023 survey to consider how the Site is being shaped while accounting for consolidation of the fill. The final contours promote drainage to reduce volume of leachate formed, resulting in a pyramidal shaped-mound. A remaining volume of roughly 1,758 m^3 was determined in this manner.

Using the annual disposal rate of 3,566 m^3/year, Site capacity may be reached during the spring of 2024. A summary of these calculations is presented in Appendix I.

Table 16 presents a summary of estimated volumes deposited at the landfill site during the reporting period and Chart 2 provides a summary of calculated disposal rates from 2002 to 2023. Chart 3 presents the estimated year of closure when applying the average historical disposal rates to the estimated remaining capacity.

TABLE 16: VOLUME SUMMARY 2023

Component	Estimated Volume (m^3)
Total Volume	3,302
Daily Cover Material	660*
Final Cover	0
Waste	2,642

* Volume of Daily Cover Material estimated as 20% of Total Volume.

Chart 2
Blind River Landfill Site
Historical Disposal Rates

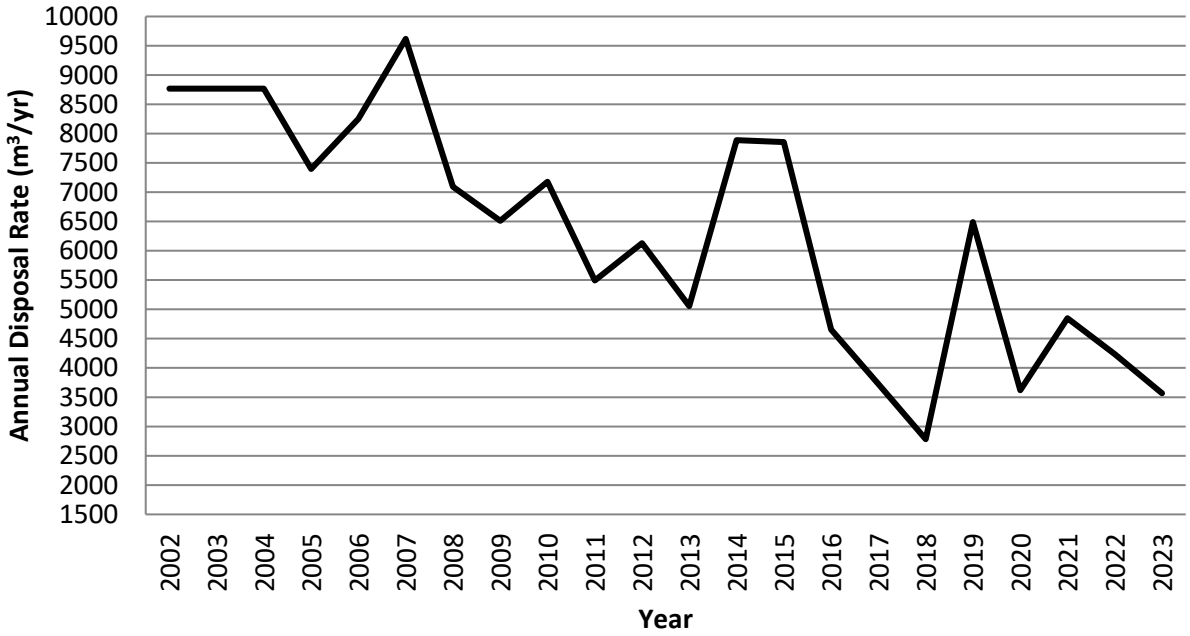
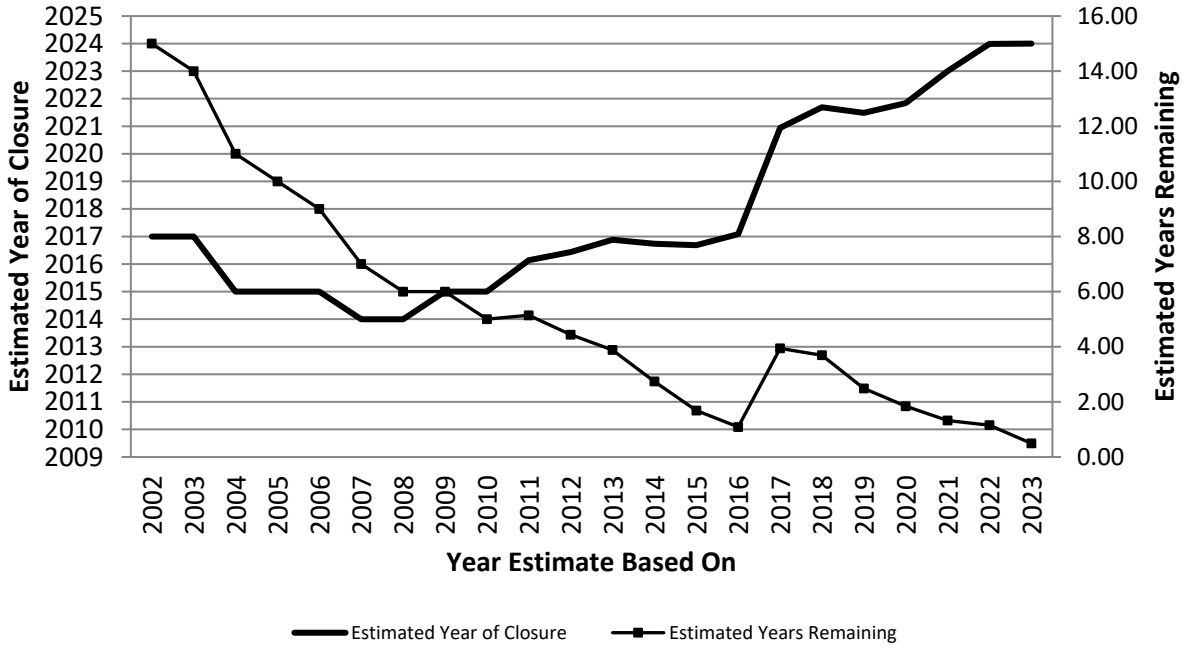


Chart 3
Blind River Landfill Site
Historical Estimates of Remaining Life Span



6.2.1 Waste Diversion

There is no record that the exact composition of wastes being disposed of at the Site has ever been determined, however, the Town does participate in a community-recycling program which diverts some common recyclables. Currently, rubber tires, white goods and electronics are stockpiled at the landfill for future recycling. Brush/scrap wood is also stockpiled for grinding or burning, in accordance with MECP procedures, prior to its landfilling.

Table 17 provides a summary of the estimated tonnage of recyclable material received at the Site for 2023 (provided by the Site operator).

TABLE 17: 2023 RECYCLING REPORT

Producer	Recyclable Material (tonnes)		
	FIBER	COMM	E-WASTE
Commercial	102.48	1.22	NA
GFL Depot	34.30	14.17	NA
Landfill	12.30	5.64	NA
Residential	51.74	29.47	NA
Totals	**200.82**	**50.50**	**NA**

The total waste deposited at the Site, as provided by the Town's operator, was estimated to be approximately 2,890.78 tonnes for 2023. This total waste tonnage has remained relatively constant since the data became available. The total recyclable tonnage, also provided by the operator, was 251.32 tonnes. The estimated diversion rate is therefore calculated to be 10.4%. The diversion rate calculation is included in Appendix I of this report.

6.3 Complaints

There were no complaints reported to the Town of Blind River regarding the Site during the 2023 monitoring period.

6.4 MECP Site Visit

The MECP did not complete an inspection at the Site during the 2023 reporting period.

6.5 General Comments

During 2023, with the exception of encountering challenges with the collection of tipping fees, no landfill site operational difficulties were identified by the Town of Blind River or the Site Operator.

General comments regarding Site operation include:

1. Signs have been installed and maintained at the main entrance of the Site and throughout the landfill to direct users appropriately.

2. The hours of operation for the Site are Wednesday, Thursday and Friday 10am-6pm and Saturday 9am-5pm during the summer (April 1 – Oct. 31). Wednesday to Saturday 9am-5pm during the winter (Nov.1 – March 31).

3. The Site is closed by a locked gate when a site attendant is not present to supervise landfilling operations.

4. The Town did not hold a household hazardous waste day in 2023.

5. The Town noted that at the beginning of 2023, the Site Operator was having difficulty meeting cover requirements at the landfill site, however, this issue was corrected during the reporting period.

6. Excess soil from a local road job was stockpiled at the Site for use as interim cover.

7. The Site Operator noted that the sand material used for cover along the landfill side slopes was easily eroded. To address this, clean wood material was chipped and mixed with the sand to provide greater slope stability and erosion resistance.

8. Mattresses were noted by the Site Operator as being difficult to compact and disrupted cover when driven over. The Town increased the tipping fee for the disposal of mattresses unless the mattress was received disassembled with the metal components removed.

9. Throughout the year, a variety of wildlife, including black bears, foxes, crows, ravens, gulls and eagles frequented the Site; however, no incidents of nuisance were reported.

10. Wood waste is burned at the Site in accordance with the MECP Guideline C-7. The burning of plywood, particle board, painted, varnished surfaces, etc. is prohibited and these materials must be landfilled.

11. Attention is being paid, by the Town as well as the contracted operator, to minimize environmental impacts, maximize public approval/satisfaction, as well as divert recyclable materials from landfilling.

7.0 CONCLUSIONS

The following conclusions are drawn from the assessments described herein:

1. The Site appears to be generally well run and site operations are considered satisfactory with respect to the control of dust and odour. No vector or vermin problems were observed and the Site was generally kept in good order throughout the reporting period.

2. Environmental monitoring was completed during the 2023 reporting period and the existing monitoring well network is felt to be adequate. Off-site impact in a direction hydrogeologically downgradient from the fill area is suspected and the continued monitoring of these impacts is required.

3. The assessment of groundwater trigger mechanisms reveals that:

    a. The trigger concentration for DOC was exceeded at MW3-02, MW4-02, MW1-03, MW1-15, and MW1-17 and MW1-20 during the 2023 spring and fall sampling events. DOC also exceeded trigger concentrations at MWMW1-02 and MW6-02 during the spring sampling event.
    b. During both spring and fall sampling events, iron exceeded trigger concentrations at MW4-02, MW6-02, MW1-03, MW1-15, MW3-15, MW4-15, MW1-17 and MW1-20. Tigger concentrations for iron were also exceeded at MW3-02 during the spring sampling event.
    c. During the spring and fall sampling events, MW1-03 and MW1-20 exceeded trigger concentrations for barium.
    d. During the spring and fall sampling events, chloride and sodium exceeded trigger concentrations at MW1-20 and MW1-03.
    e. MW1-03 exceeded trigger concentrations for alkalinity and boron during the spring and fall sampling events.

4. The Town is pursuing the establishment of a CAZ and is implementing improvements to site surface water management to address trigger mechanism exceedances.

5. With respect to surface water, SW2 appears to have been formed in a depression constructed during development of the solar farm that was excavated to below the water table. As SW2 is located within the limits of the delineated CAZ, leachate impacts at this location would not be unexpected.

6. SW3 is very near to a contractor's yard and may be impacted by related operations. There is no direct surface water flow pathway from areas potentially impacted by the landfill to SW3.

7. SW4 is a ponded area located just south of the toe of the fill area and within the limits of the delineated CAZ. Similarly to SW2, leachate impacts at this location would not be unexpected.

8. SW5 was not observed during the 2023 Site visits. This surface water location (a previously excavated ditch) has been filled in conjunction with the surface water management improvements.

9. Parameter concentrations at the SW6 appear to confirm this location as an appropriate background location.

10. It is difficult to confirm the source of impact observed at SW7 considering its proximity to Highway 17 and the railway line. Additional sampling is recommended to expand the database to assist with an evaluation of impact.

11. Winter highway de-icing activities may be contributing to the chloride levels impacting water quality at sample locations adjacent/downgradient of Highway 17 (MW1-03, MW1-20, SW7).

12. Based on topographic surveys completed at the Site, approximately 3,302m^3 of waste and cover material were deposited at the Site in 2023. Remaining site life is estimated to extend to the spring of 2024.

8.0 RECOMMENDATIONS

The following recommendations are provided for the Town's consideration:

1. Groundwater and surface water monitoring should be carried out as recommended (twice annually) to develop an adequate database to evaluate leachate production and migration within and from the Site.

2. Groundwater level measurements should continue to be collected during each sampling event to facilitate the ongoing interpretation of groundwater flow direction.

3. Surface water monitoring should be carried out as recommended in ECA No. A-500-7134513066 (quarterly) to support evaluation of leachate migration within and from the Site, as well as to confirm SW6 as the appropriate background location.

4. The contracted operator should continue to ensure that all landfill waste is disposed of within the approved area which is delineated by field markers.

5. Adequate cover should continue to be placed on the landfill waste in order to avoid windblown material.

6. The contracted operator should continue to minimize the co-mingling of segregated waste.

7. The steel protective casings at MW1-03 and MW2-15 should be repaired to ensure the integrity of these monitoring wells.

8. To ensure that steel casings are accessible, weathered locks at MW2-02 and MW3-15 should be replaced.

9. The Town should continue to work diligently through the EA process to ensure an adequate waste management plan can be developed and that MECP is provided updates when required.

This report is respectfully submitted by:
Kresin Engineering Corporation

Jennifer Sharpe, B.Sc.
Environmental Scientist

Chris Kresin, M.Sc.(Eng.), P.Eng.
Consulting Engineer

Appendix A
MECP Amended Provisional Certificate of Approval

BR04.09

23)

Ministry of the Environment
2 St. Clair Ave. West
Toronto ON M4V 1L5

Ministère de l'Environnement
2, avenue St. Clair Ouest
Toronto ON M4V 1L5

Ontario

IVIRONMENTAL ASSESSMENT AND APPROVALS BRANCH

January 6, 2000

:n Corbiere, Municipal Clerk
)rporation of the Town of Blind River
O. Box 640
. Hudson Street
lind River, Ontario
)R 1B0

ear Mr. Corbiere:

e: Use of Sawdust and Wood Bark as daily and Interim Cover: Blind River Landfill Site.

lease find enclosed a Notice of Amendment for Provisional Certificate of Approval No A 713870, which enables e use of sawdust and wood bark as daily or interim cover for a two year temporary period. The Notice requi ie submission of cover performance reports to the District Manager by each of December 31, 2000 and Decembe 0, 2001.

Sincerely,

Andrzej Dominski, P.Eng.
Section 39, Director

incl.
RB/aq

: Ken Corbiere, Clerk, Town of Blind River
District Manager, MOE Subury District Office

RECEIVED
JAN 27

O.C. FORESTRY LTD.

Ministry of the Environment / Ministère de l'Environnement

Ontario

Corporation of the Town of Blind River
Box 640
11 Hudson Street
Blind River, Ontario
P0R 1B0

You are hereby notified that Provisional Certificate of Approval No. A 7138701 dated May 30, 3, issued to you, Corporation of the Town of Blind River is being amended as follows:

The owner's name is changed

:

Corporation of the Town of Blind River
Box 640
11 Hudson Street
Blind River, Ontario
P0R 1B0

om:

Town of Blind River
Box 640
11 Hudson Street
Blind River, Ontario
P0R 1B0

e following definitions are added to your Provisional Certificate of proval:

(a) "Certificate" means the Provisional Certificate of Approval No. A 7138701 as amended from time to time, including all Schedules attached to and forming part of this Certificate, as well as all Notice of Amendments;

(b) "Director" means the one or more persons who from time to time are so designated for the purpose of Part V of the Environmental Protection Act, R.S.O. 1990, as amended from time to time;

(c) "District Manager" means the District Manager of the Sault Ste. Marie District Office of the Ministry of the Environment;

(d) "EPA" means the Environmental Protection Act, R.S.O. 1990, as amended from time to time;

(e) "Owner" means the Corporation of the Town of Deep River;

(f) "Ministry" or "MOE" means the Ontario Ministry of the Environment;

(g) "Regional Director" means the Director, Northern Region of the Ministry of the Environment;

(h) "Site" means the 2 ha landfill operation and adjacent buffer lands located in Part Lot 7, Conc. 1 Striker Township;

Conditions No. 3,4,5,6, and 7 are added to your Provisional Certificate of Approval:

3. The owner is allowed to use wood bark and sawdust as daily and interim cover material for a temporary period of two years, or until the site is closed, whichever is less.

4. Should the use of wood bark or sawdust as daily and interim cover cause any environmental problem the owner shall discontinue its use.

5. Sufficient soil cover shall be available on site for use either when conditions do not permit use of the sawdust or wood bark as daily of interim cover or if performance of the material is unsatisfactory.

6. The performance and impact of the wood bark and sawdust shall be detailed in a written report which is submitted to the District Manager by the end of each of December 2000 and December 2001.

7. Only with the written consent of the District Manager shall sawdust and wood bark be used for daily or interim cover subsequent to the date which occurs two years after the date of this Notice of Amendment. The District Manger may rescind that consent at any time by provision of written notice to the owner.

The reasons for the addition of definitions and conditions 3, 4, 5, 6, and 7 are:

1. *The reason for the addition of the definitions is that it is in the public interest to clearly define terms used in this Certificate.*

2. *The reason for the additions of conditions number 3, 4, 5, 6, and 7 is to ensure that the Site is operated in an environmentally safe manner.*

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

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

In addition to these legal requirements the Notice should also include:

The name of the appellant;
The address of the appellant;
The Certificate of Approval number;
The date of the Certificate of Approval;
The name of the Director;
The municipality within which the waste disposal site is located;
or
The municipality within which the waste management system is located;

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

This Notice must be served upon:

The Secretary,
Environmental Appeal Board,
1300 Yonge St., 12th Floor,
P.O. Box 2382
Toronto, Ontario.
M4P 1E4

AND

The Director,
Section 39, Environmental Protection Act,
Ministry of Environment and Energy,
250 Davisville Avenue, 3rd Floor,
Toronto, Ontario.
M4S 1H2

DATED AT TORONTO this 6th *day of* January, 2000

A. Dominski, P. Eng.
Director
Section 39
Environmental Protection Act

CB/aq
c: Ken Corbiere, Clerk, Town of Blind River
District Manager, MOE Subury District Office

COPY

(705) 670-3282 (705) 670-3282

April 25, 1994

The Corporation of the Town of Blind River
P.O. Box 640
11 Hudson Street
Blind River, Ontario
P0R 1B0

Attention: Mr. Ken Corbiere
Clerk Administrator

Dear Mr. Corbiere:

Re: The Corporation of the Town of Blind River
Amendment to Certificate of Approval No: A7138701

Please find enclosed a Notice which amends Provisional Certificate of Approval No. A7138701, to allow the addition of non-hazardous solid industrial waste and iron sludge waste to the categories of waste which can be accepted and disposed of at your site.

Should you have any questions regarding this amendment, please contact Ms. Maureen Burtch at the Sault Ste. Marie District Office.

Yours truly,

C. J. Lafrance
Supervisor
Approvals and Planning Unit
Mid Ontario Region

MEC/nc/C04-31

bcc: G. LaHaye/M. Burtch, SSM Office
Approvals Branch
Environmental Monitoring & Reporting Branch
J. G. Fry/C. J. Lafrance/File MP 13-02
MEC
C of A File A7138701

Encl.

THIS IS A TRUE COPY OF THE

ORIGINAL DATED ON APRIL 26/94
MEC

Ministry of the Environment | Ministère de l'Environnement

Notice
Avis

ataire

The Corporation of the Town of Blind River
P.O. Box 640, 11 Hudson Street
Blind River, Ontario
P0R 1B0

Pursuant to sections 39(2) and 139(2) of the Environmental Protection Act (the "EPA") R.S.O. 1990, you are hereby notified that Provisional Certificate of Approval No. A7138701 dated November 26, 1980 is being altered to allow the addition of non-hazardous solid industrial waste and iron sludge waste to the categories of waste presently being deposited at this site.

The above-noted Provisional Certificate of Approval is amended by adding the following conditions:

2. Except as otherwise provided by these Conditions, this waste disposal site (landfill) shall be operated in accordance with the application dated October 22, 1993, and supporting documentation, plans and specifications submitted therewith, and the additional items listed in Schedule "A" below.

The reason for Condition 2 is to ensure that this waste disposal site (landfill) is operated in accordance with the application submitted to amend the Provisional Certificate of Approval and not on a basis which the Director has not been asked to consider.

3. (1) The operation of this site shall be limited only to the acceptance and disposal of the following types of waste:

(a) domestic, commercial, and other waste limited to scrap wood and brush;

(b) non-hazardous solid industrial waste; and

(c) iron sludge waste generated only from the potable water treatment facility located at Cameco Corporation in Blind River, all in accordance with Schedule "A" below.

(2) Notwithstanding Condition 3(1) above, no hauled sewage, liquid industrial waste, or hazardous waste, as defined under Regulation 347, R.R.O. 1990, shall be accepted and/or deposited at this site.

The reason for Condition 3 is to ensure that the types of waste accepted and deposited at this site are in accordance with that approved by this Provisional Certificate of Approval.

... 2

Schedule "A"

Schedule "A" is hereby amended to add the following:

Letter dated January 19, 1994 from J.M. Degraw, Cameco Corporation, to Maureen Burtch, Ministry of Environment and Energy, outlining the nature of the iron waste sludge.

Should you wish to appeal any or all of these conditions you may, by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142(1) of the Environmental Protection Act, as amended in 1983, provides that the Notice requiring the hearing shall state:

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

In addition to these legal requirements, the Notice should also include:

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

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

Please note, unless stayed by application under Section 143 of the Environmental Protection Act, this approval is effective from the date of issue.

This Notice must be served upon:

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

AND

The Director
Section 39, E.P.A.
Ministry of Environment and Energy
199 Larch Street, Suite 1101
Sudbury, Ontario
P3E 5P9

DATED at Sudbury, this 25th day of April, 1994.

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

MEC/mec/A7138701.NOT

Ontario

Ministry of the Environment

135 St. Clair Ave., W.,
Toronto, Ontario
M4V 1P5

November 26, 1980

N.O.E. NORTHEASTERN DEC 5 1980 RECEIVED SUDBURY

RECEIVED
OCT 0 ? 2001

Town of Blind River
Box 640
11 Hudson Street
Blind River, Ontario
P0R 1B0

Re: Landfilling Site
South 1/2 Lot 7, Concession 1
Township of Striker
District of Algoma

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

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

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

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

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

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

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

Yours very truly

Director

Ministry of the Environment
Ontario

a- File in Bk.
c.c. - J. Harmar

FILE: Blind River w.d.s.
Provisional Certificate No. A 713870I

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:

Town of Blind River
Box 640
11 Hudson Street
Blind River, Ontario
P0R 1B0

RECEIVED
DEC - 8 1980
S. S. MARIE
DISTRICT OFFICE

for the use and operation of a landfilling site within a total site area of 2 hectares.

all in accordance with the following plans and specifications:
Application and supporting information forms for a Waste Disposal Site.
Plan of the Waste Disposal Site entitled "Layout of Town Garbage Dump" dated Dec. 10, 1973.

Located: South 1/2 Lot 7, Concession 1
Township of Striker
District of Algoma

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, commercial and "other" (limited to scrap wood and brush) wastes.

and subject to the following conditions:

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

THIS IS A TRUE COPY OF THE ORIGINAL CERTIFICATE MAILED

ON DEC 4 1980

(Signed)

Dated this 26th day of November, 19 80.

Director, Section 39,

Environment
Ontario

NOTICE

TO: Town of Blind River
Box 640
11 Hudson Street
Blind River, Ontario
P0R 1B0

You are hereby notified that Provisional Certificate of Approval No. A 7138701 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 within a period of twenty-five years from the year in which such land ceased to be used unless the approval of the Minister for the proposed use has been given. The purpose of this prohibition is 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:

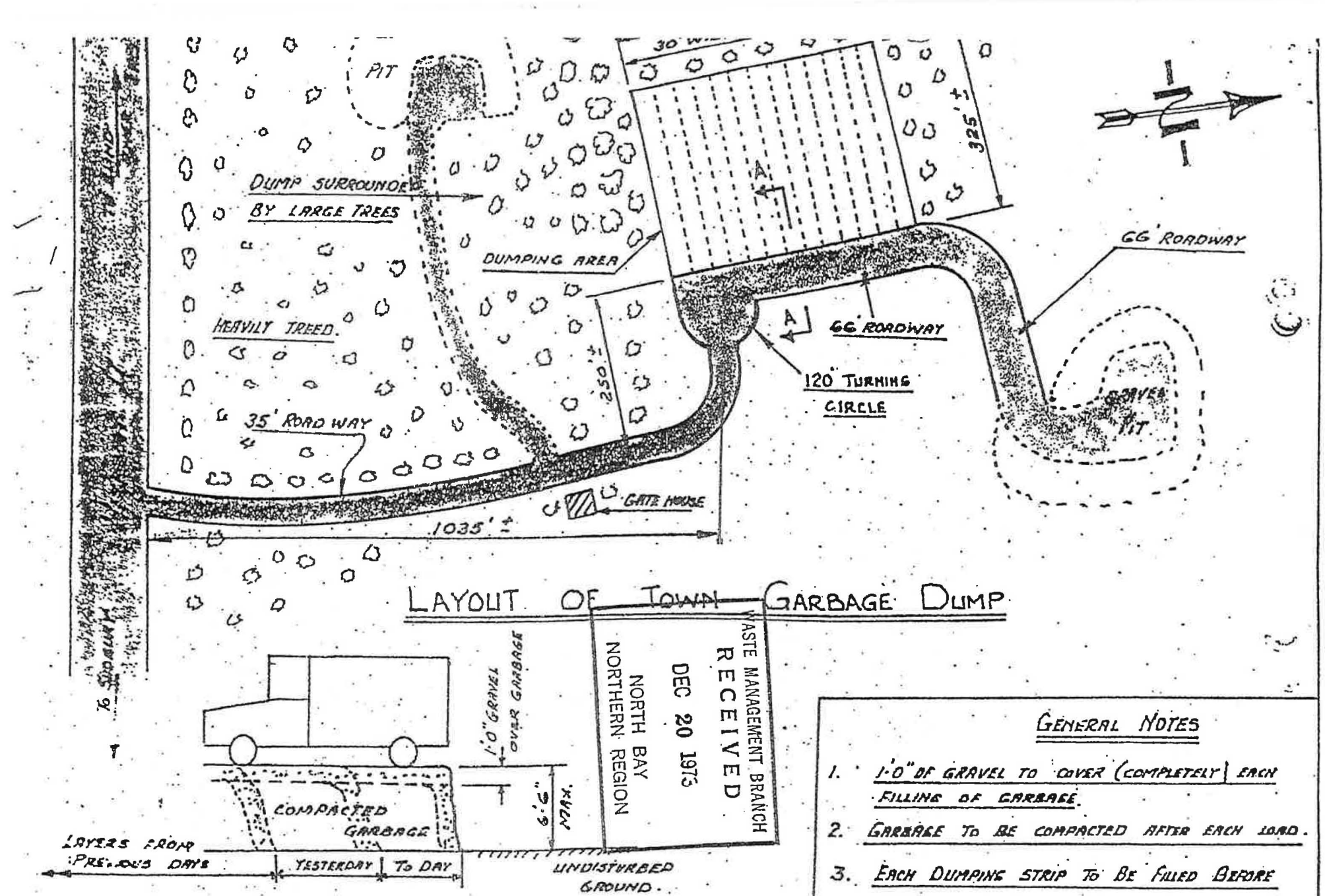
The Secretary,
Environmental Appeal Board,
1 St. Clair Ave. West,
5th Floor,
Toronto, Ontario,
M4V 1K7

AND

The Director,
Section 3a E.P.A.
Ministry of the Environment,

DATED Toronto this 26th day of November, 1980.

T.W. Dixon



General Notes

1. 1'0" of gravel to cover (completely) each filling of garbage.
2. Garbage to be compacted after each load.
3. Each dumping strip to be filled before moving to next strip.

Town of Blind River	Proposed Dump and Dumping Proceedure.	H.C. Kiernan C.E.T.

ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A-500-7134513066
Version: 1.0
Issue Date: October 26, 2022

Pursuant to section 20.3 of the Environmental Protection Act, Revised Statutes of Ontario (R.S.O.) 1990, c. E. 19 and subject to all other applicable Acts or regulations this Environmental Compliance Approval is issued to:

CORPORATION OF TOWN OF BLIND RIVER

11 HUDSON ST, BOX 640
BLIND RIVER ONTARIO
P0R1B0

For the following site:

Lot: 7, Concession: 1
Blind River, District of Algoma

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 establishment of stormwater management works to service the existing municipal waste disposal site (Site), located on south ½ of lot 7, Concession 1, and Highway 17 to the south within in the Town of Blind River, District of Algoma, for the collection, transmission, and disposal of stormwater runoff from a total catchment area of 10.95 hectares to attenuate post-development peak flows to pre-development peak flows for all storm events up to and including the 100-year storm event, infiltrating into ground consisting of the following:

- **drainage swale (Intercepting Swale 1 – Catchment Area 6.1 ha):** one (1) 220 metre long drainage swale with 1.75 metre base width, 3:1 side slope and 1 metre flow depth, flowing along the northern perimeter of existing landfill site, discharging to the proposed infiltration basin located on the western perimeter of the landfill site;
- **drainage swale (Intercepting Swale 2 – Catchment Area 4.85 ha):** one (1) 200 metre long drainage swale with 1.75 metre base width, 3:1 side slope and 1 metre flow depth, flowing along the southern perimeter of existing landfill site, discharging to the proposed infiltration basin located on the southern perimeter of the landfill site;
- **infiltration basin (Catchment Area 10.95 ha):** one (1) infiltration basin located on the western perimeter of the landfill site, having a total length of 225 metres, a width of 12 metres, a base area of 2,700 squared metres, a minimum storage depth of 1.25 metres including 0.75 metres operating depth and 0.5 metres freeboard and providing an approximate storage volume of 2,430 cubic metres to store and infiltrate stormwater run-off from the site, infiltrating at 0.05 cubic metres per second under the 100-year storm event, complete with an overflow riprap spillway, flow in excess of the 100-year storm directed overland on to the attenuation zone, ultimately to the Lake Huron.

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted application and supporting documents listed in Schedule 1 forming part of this Approval.

DEFINITIONS

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

1. "Approval" means this entire Environmental Compliance Approval and any Schedules attached to it;
2. "CAZ " means Contaminant Attenuation Zone;
3. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;
4. "District Manager" means the District Manager of the appropriate local district office of the Ministry, where the Works are geographically located;
5. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19, as amended;
6. "Ministry" means the ministry of the Minister and includes all, employees or other persons acting on its behalf;
7. "MNRF" means the Ministry of Natural Resources and Forestry of the government of Ontario and includes all officials, employees or other persons acting on its behalf;
8. "OWRA" means the *Ontario Water Resources Act,* R.S.O. 1990, c. O.40;
9. “Owner” means Corporation of Town of Blind River, including any successors and assignees;
10. “Quarterly” means during time periods of three (3) consecutive months beginning on the first day of January, April, July or October;
11. “Works” means the approved sewage works.

TERMS AND CONDITIONS

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

1. **GENERAL CONDITIONS**
    1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
    2. Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.
    3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.
    4. Where there is a conflict between the documents listed in Schedule A and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.
    5. The conditions of this Approval are severable. If any condition of this Approval, or the application of any requirement 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.
    6. The issuance of, and compliance with the conditions of, this Approval does not:
        1. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including, but not limited to, the obligation to obtain approval from the local conservation authority/MNRF necessary to construct or operate the sewage works; or
        2. limit in any way the authority of the Ministry to require certain steps be taken to require the Owner to furnish any further information related to compliance with this Approval.

2. **EXPIRY OF APPROVAL**

1. This Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

2. In the event that completion and commissioning of any portion of the Works is anticipated to be delayed beyond the specified expiry period, the Owner shall submit an application of extension to the expiry period, at least twelve (12) months prior to the end of the period. The application for extension shall include the reason(s) for the delay, whether there is any design change(s) and a review of whether the standards applicable at the time of Approval of the Works are still applicable at the time of request for extension, to ensure the ongoing protection of the environment.

3. **CHANGE OF OWNER**

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

    a. change of Owner;

    b. change of address of the Owner;

    c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c.B17 shall be included in the notification to the District Manager; or

    d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.

2. In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

3. The Owner shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

4. **OPERATION AND MAINTENANCE**

1. If applicable, any proposed storm sewers or other stormwater conveyance in this Approval can be constructed but not operated until the proposed stormwater management facilities in this Approval or any other Approval that are designed to service the storm sewers or other stormwater conveyance are in operation.

2. The Owner shall make all necessary investigations, take all necessary steps and obtain all necessary approvals so as to ensure that the physical structure, siting and operations of the Works do not constitute a safety or health hazard to the general public.

3. The Owner shall undertake an inspection of the condition of the Works, at least once a year, and undertake any necessary cleaning and maintenance to ensure that sediment, debris and excessive decaying vegetation are removed from the Works to prevent the excessive build-up of sediment, oil/grit, debris and/or decaying vegetation, to avoid reduction of the capacity and/or permeability of the Works, as applicable. The Owner shall also regularly inspect and clean out the inlet to and outlet from the Works to ensure that these are not obstructed.

4. The Owner shall construct, operate and maintain the Works with the objective that the effluent from the Works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen, foam or discoloration on the receiving waters.

5. The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the Owner's administrative office for inspection by the Ministry. The logbook shall include the following:

    a. the name of the Works; and

b. the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed and method of clean-out of the Works.

6. The Owner shall prepare an operations manual prior to the commencement of operation of the Works that includes, but is not necessarily limited to, the following information:
    a. operating and maintenance procedures for routine operation of the Works;
    b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;
    c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;
    d. contingency plans and procedures for dealing with potential spills and any other abnormal situations and for notifying the District Manager; and
    e. procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.
7. The Owner shall maintain the operations manual current and retain a copy at the Owner's administrative office for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

5. **TEMPORARY EROSION AND SEDIMENT CONTROL**
    1. The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every two (2) weeks and after each significant storm event (a significant storm event is defined as a minimum of 25 millimetres of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.
    2. The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

6. **MONITORING**

Surface Water Monitoring

1. A surface water monitoring program shall be carried out by the Owner, as outlined in Schedule 2, Table 1.
2. A trigger mechanism and contingency plan shall be completed, to the satisfaction of the District Manager, and submitted for concurrence within six months of the issuance of this ECA. The trigger mechanism and contingency plan shall incorporate the following:

- A monitoring well, between CAZ boundary well and the fill area, and accompanying trigger levels that would provide sufficient time to identify a potential for surface water impacts from the landfill leachate plume, before they occur, and time to implement contingency measures, to prevent unacceptable surface water impacts;
- A monitoring well at the CAZ boundary to determine if unacceptable concentrations of leachate parameters are entering surface waters;
- Comparison of parameter concentrations at monitoring wells to those of source leachate well and background well, to determine if elevated parameter concentrations at downgradient wells are a result of landfill operations;
- Trigger concentrations for wells monitoring for potential impacts to surface waters, shall be linked to contingency actions;
- Contingency actions proposed shall be feasible for the Site and be beyond standard operational practices.

Seep Monitoring

3. The Owner shall monitor for seeps as outlined in Schedule 2, Table 2 and results shall be documented in the annual monitoring reports.

7. **REPORTING**

1. One (1) week prior to the start-up of the operation of the Works, the Owner shall notify the District Manager (in writing) of the pending start-up date.

2. The Owner shall, upon request, make all reports, manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

3. The Owner shall prepare a performance report within ninety (90) days following the end of the period being reported upon, and submit the report(s) to the District Manager annually by March 31. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be prepared to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

    1. a description of any operating problems encountered and corrective actions taken;

    2. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works, including an estimate of the quantity of any materials removed from the Works;

    3. a summary of any complaints received during the reporting period and any steps taken to address the complaints;

    4. a summary of all spill or abnormal discharge events; and

    5. any other information the District Manager requires from time to time.

    6. a summary and interpretation of surface water monitoring data and groundwater monitoring data used in monitoring for potential impacts to surface waters; and

    7. a summary of results of seep monitoring. If none are found, this information shall also be reported.

8. **RECORD KEEPING**

    1. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation, maintenance and monitoring activities required by this Approval.

REASONS

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

1. Condition 1 is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted. This condition is also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. Condition 1.6 is included to emphasize that the issuance of this Approval does not diminish any other statutory and regulatory obligations to which the Owner is subject in the construction, maintenance and operation of the Works. The Condition specifically highlights the need to obtain any necessary conservation authority approvals. The Condition also emphasizes the fact that this Approval doesn't limit the authority of the Ministry to require further information.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included as regular inspection and necessary removal of sediment and excessive decaying vegetation from the Works are required to mitigate the impact of sediment, debris and/or decaying vegetation on the treatment capacity of the Works. The Condition also ensures that adequate storage is maintained in the Works at all times as required by the design. Furthermore, this Condition is included to ensure that the Works are operated and maintained to function as designed.

5. Condition 5 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction until they are no longer required.
6. Condition 6 is 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 near or at the site.
7. Condition 7 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.
8. Condition 8 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

APPEAL PROVISIONS

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

I. 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;

II. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

I. The name of the appellant;

II. The address of the appellant;

III. The environmental compliance approval number;

IV. The date of the environmental compliance approval;

V. The name of the Director, and;

VI. The municipality or municipalities within which the project is to be engaged in.

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

This Notice must be served upon:

Registrar* Ontario Land Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5 OLT.Registrar@ontario.ca	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 Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.olt.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 26th day of October, 2022



Aziz Ahmed

Director

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

c: Ryan Wilson, Kresin Engineering Corporation
Kathryn Scott, CORPORATION OF TOWN OF BLIND RIVER

The following schedules are a part of this environmental compliance approval:
Schedule 1

SCHEDULE 1

1. Application for Environmental Compliance Approval, dated June 21, 2021, received on June 21, 2021, submitted by Kresin Engineering Corporation on behalf of the Town of Blind River;
2. Municipal Waste Disposal Site Expansion - SURFACE WATER MANAGEMENT PLAN AND SYSTEM DESIGN, SWM Report, dated June 2021, prepared by Kresin Engineering Corporation;
3. Revised SWM Report "The Corporation of the Town of Blind River Municipal Waste Disposal Site Expansion Surface Water Management Plan and System Design, prepared by Kresin Engineering Corporation, dated April 7, 2022;
4. The Corporation of the Town of Blind River Municipal Waste Disposal Site - Ground and Surface Water Monitoring, Trigger Mechanisms and Contingency Plan (Monitoring Plan), prepared by Kresin Engineering Corporation - Revision 2, dated May 2022;
5. Engineering Drawings, signed, stamped and dated on August 10, 2021, prepared by Kresin Engineering Corporation;
6. Revised Engineering Drawings (2073 BR LF Drainage Management-D1.pdf and 2073 BR LF Drainage Management-D2.pdf) stamped, signed and dated on September 17, 2021; and
7. Response to Information Request, emails received from Ryan Wilson from Kresin Engineering Corporation, dated August 30, 2021 and from Chris Kresin from Kresin Engineering Corporation, dated September 20, 2021 and September 24, 2021 respectively including revised SWM report and revised drawings;

SCHEDULE 2

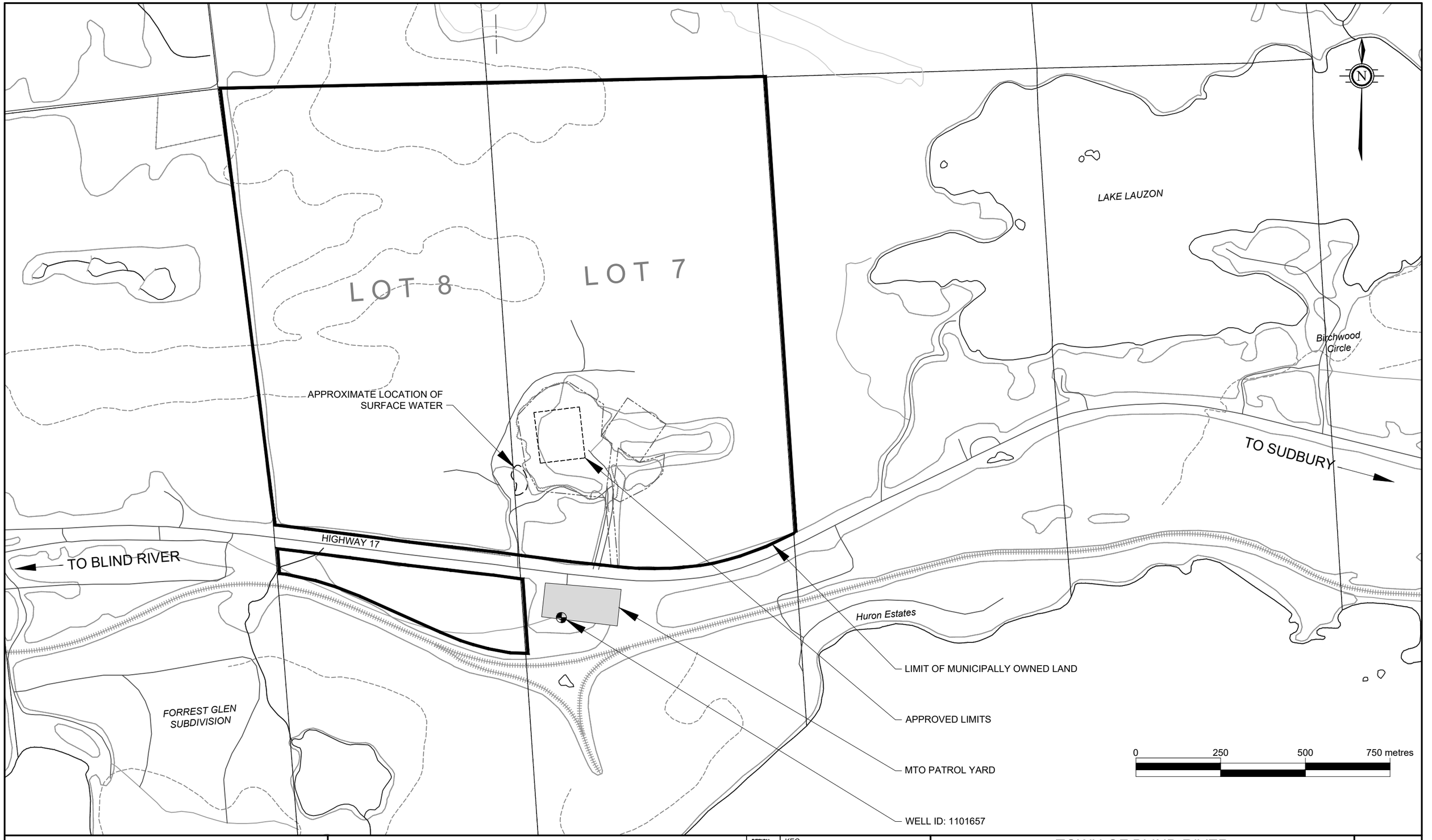
Surface Water Monitoring Program - Table 1

Sampling Locations	Frequency	Parameters to be Analysed
SW1- approximately 80 meters southwest of fill area where water pools	Quarterly	Alkalinity, ammonia, arsenic, barium, boron, cadmium, chloride, conductivity, copper, iron, lead, manganese, mercury, nitrate, nitrite, Total Kjeldahl Nitrogen, pH, total phosphorous, total suspended solids, total dissolved solids, sulphate, zinc, biological oxygen demand (BOD5), chemical oxygen demand, phenol, Chromium, DOC and Hardness. Field Parameters: Conductivity, pH, dissolved oxygen, flow and Temperature.
SW2- approximately 330 meters southwest of fill area	Quarterly	
SW3- drainage ditch approximately 440 meters southwest of fill area	Quarterly	
SW4- approximately 95 meters south of southeast corner of fill area	Quarterly	
SW5- approximately 110 meters southwest of the southeast corner of fill area	Quarterly	
SW6- background location, approximately 200 meters north of fill area	Quarterly	
SW7- 120 meters west of the southwest corner of CAZ, between Hwy 17 right-of-way and railroad tracks, within a wetland	Quarterly	

Seep Monitoring Program - Table 2

Locations	Frequency	Information to be Recorded and Parameters to be Analysed
Inspection of the site for seeps	Quarterly	If a seep is observed and quantity is sufficient, samples shall be taken for the same analysis as for surface water sampling (Table 1). Date and location (including geographic coordinates) shall be recorded. Estimate of flow rate

Appendix B
Referenced Drawings



KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

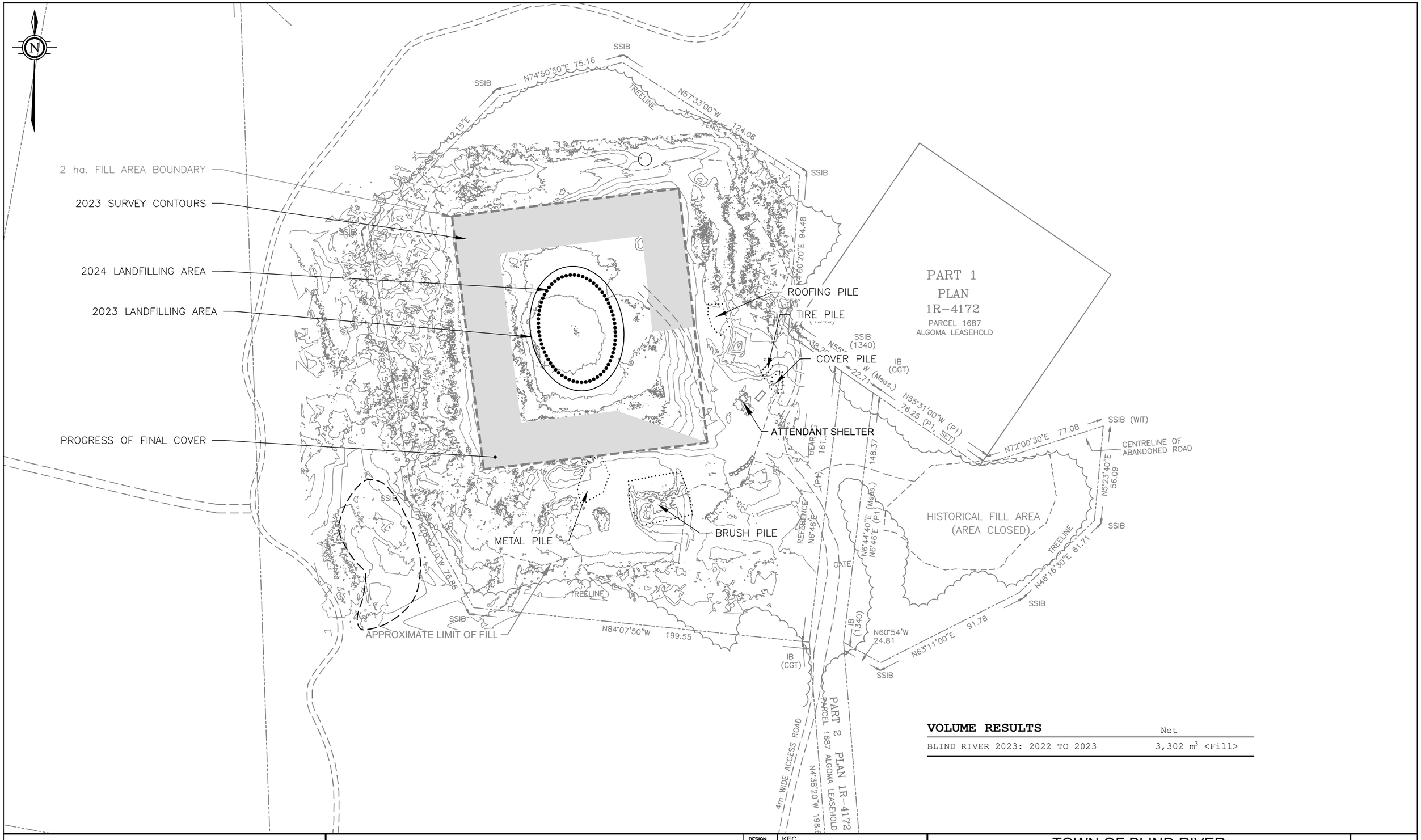
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CHECKED	J. SHARPE	02/2024
PROJECT	2331	
FILENAME	2331 report drawings.dwg	
SCALE	1:1000	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

LOCATION PLAN

B1

Rev 0



VOLUME RESULTS

	Net
BLIND RIVER 2023: 2022 TO 2023	3,302 m^3 <Fill>

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

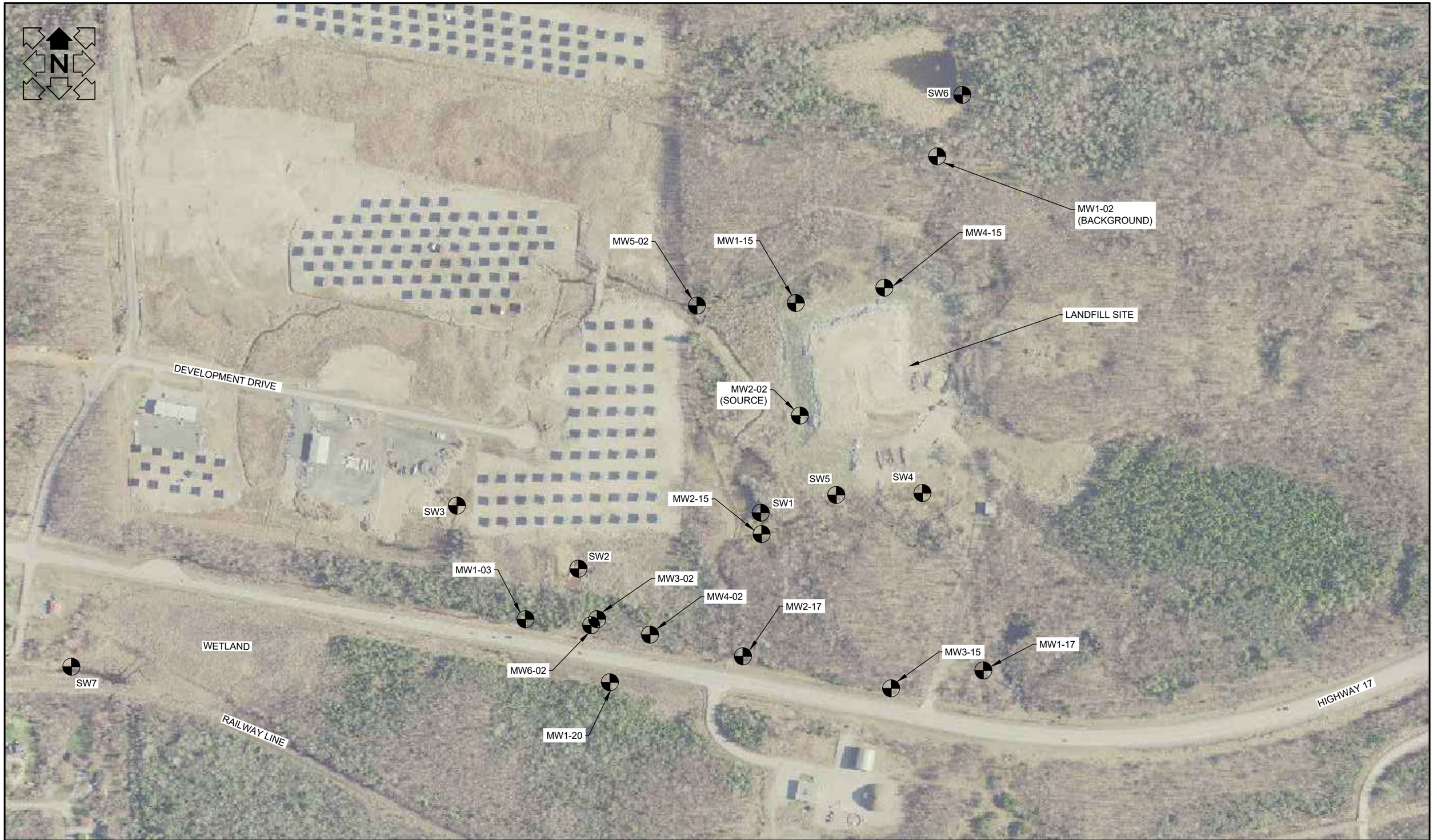
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DRAWN	K.SHERLOCK	02/2024
CHECKED	J. SHARPE	02/2024
PROJECT	2331.03	
FILENAME	2331 report drawings.dwg	
SCALE	1:2000	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

2023 FALL CONTOURS

B2

Rev 0



KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
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NOTES

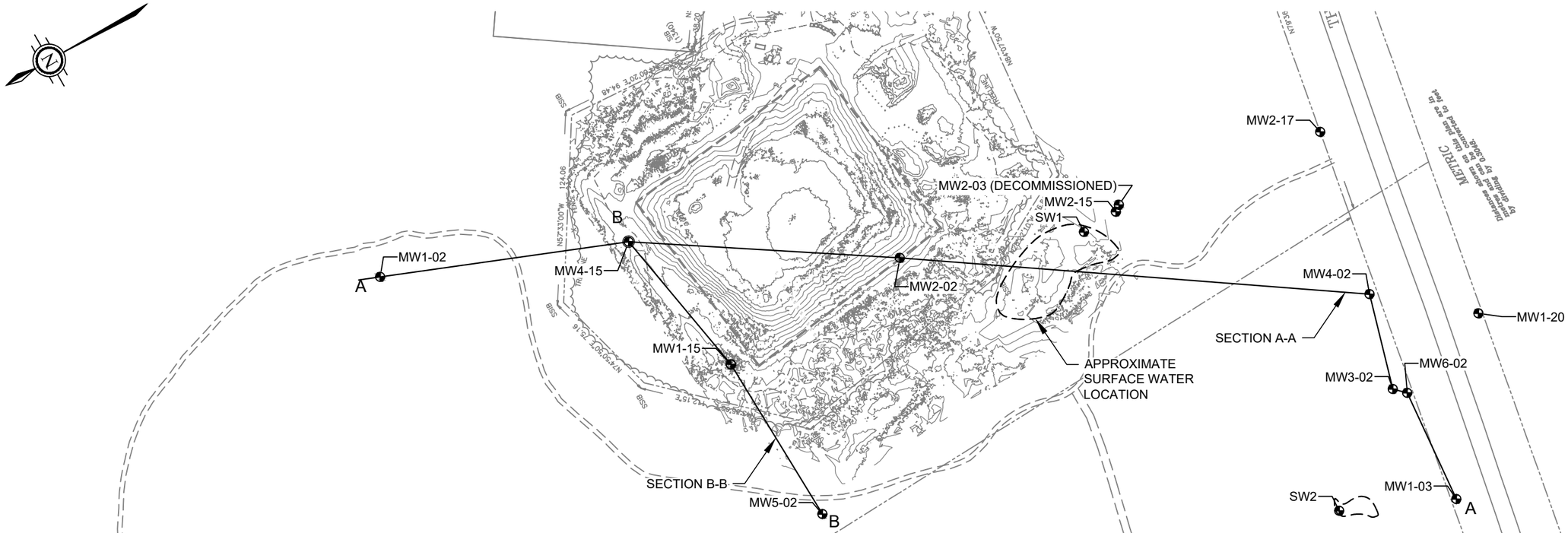
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DRAWN	JS	07/2023
CHECKED	CK	07/2023
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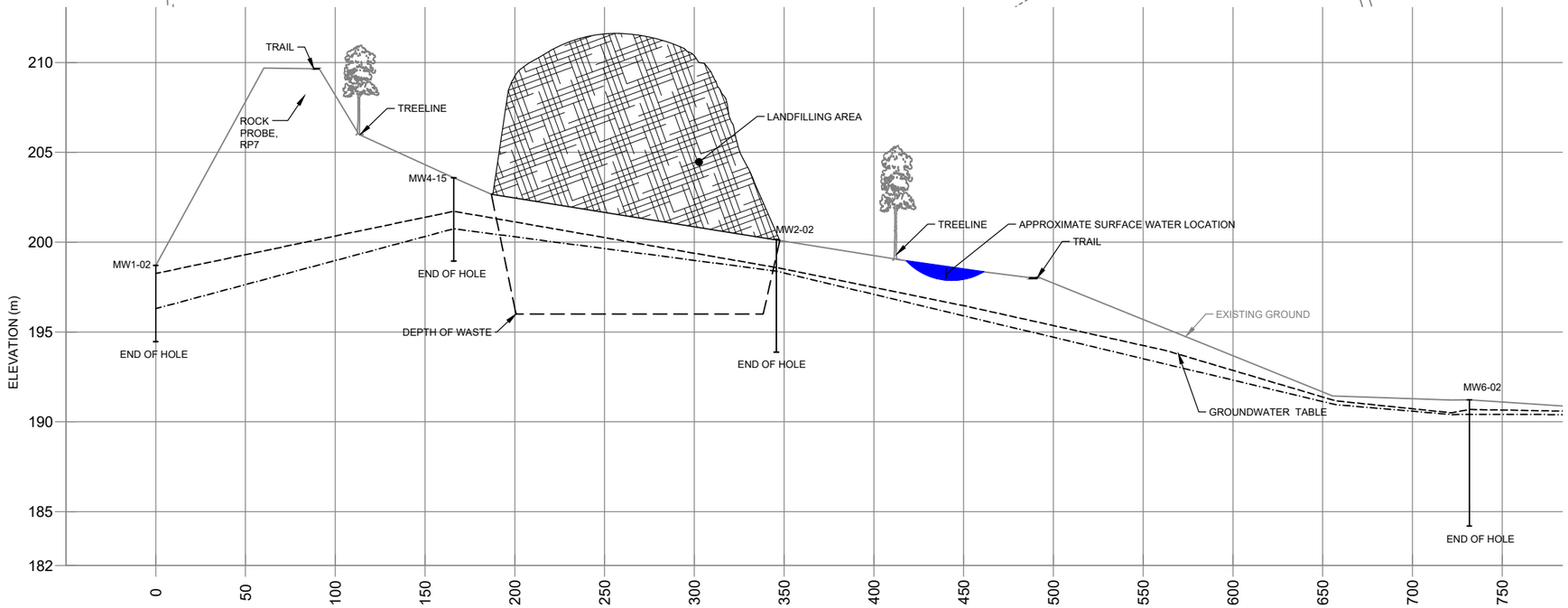
TOWN OF BLIND RIVER
MUNICIPAL WASTE DISPOSAL SITE

MONITORING WELL AND SURFACE WATER LOCATIONS

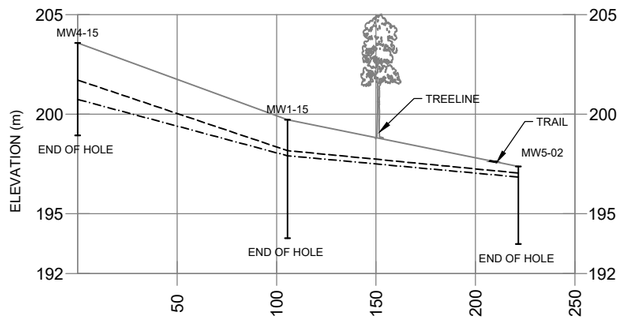
B3

Rev 0





SECTION A-A



SECTION B-B

FALL 2023 WATER TABLE
SPRING 2023 WATER TABLE

KRESIN Engineering Corporation
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NOTES

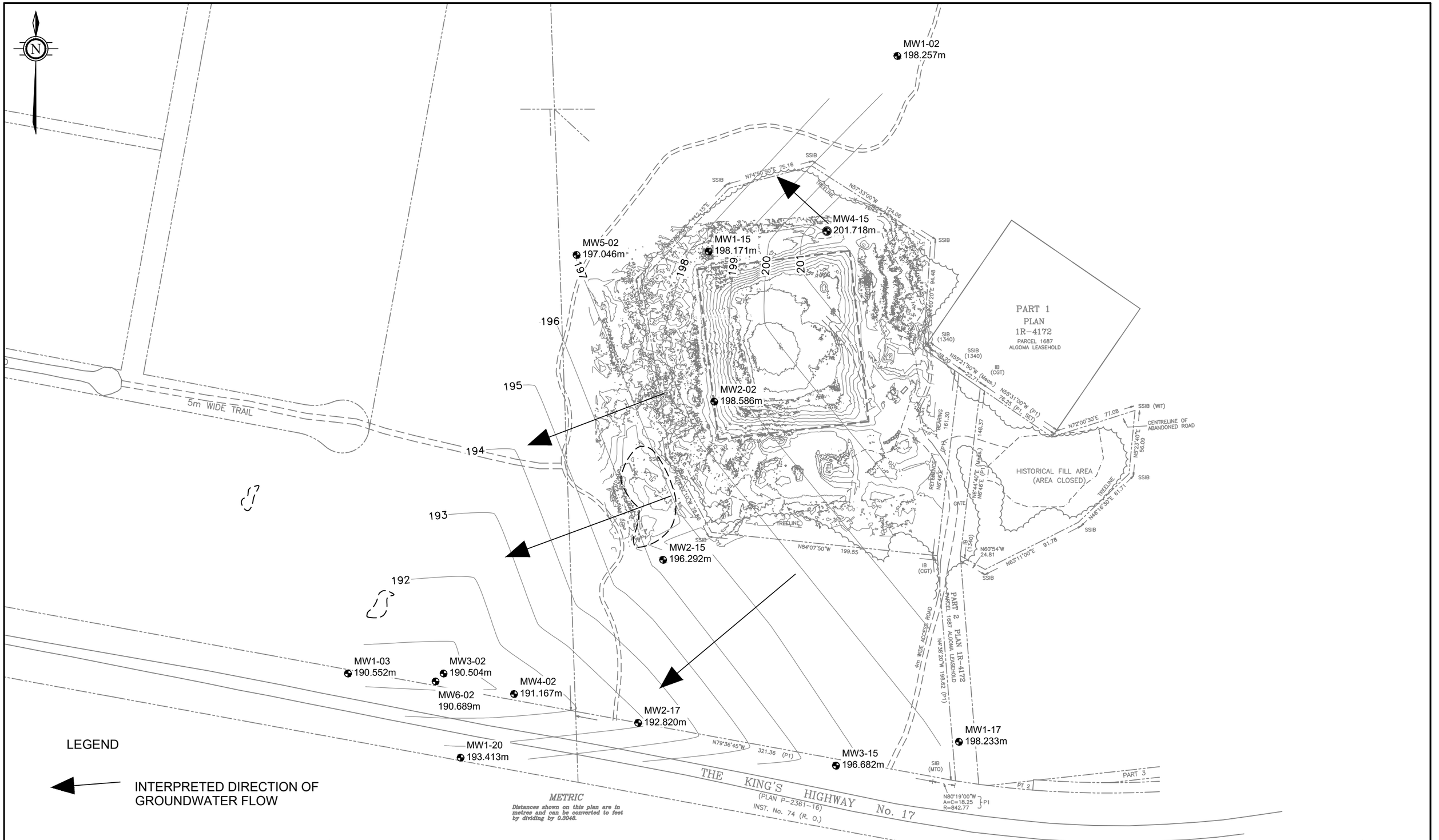
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CHECKED	J. SHARPE	02/2024
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FILENAME	2331 report drawings.dwg	
SCALE	1:3000	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

WATER TABLE ELEVATIONS

B4

Rev 0



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NOTES

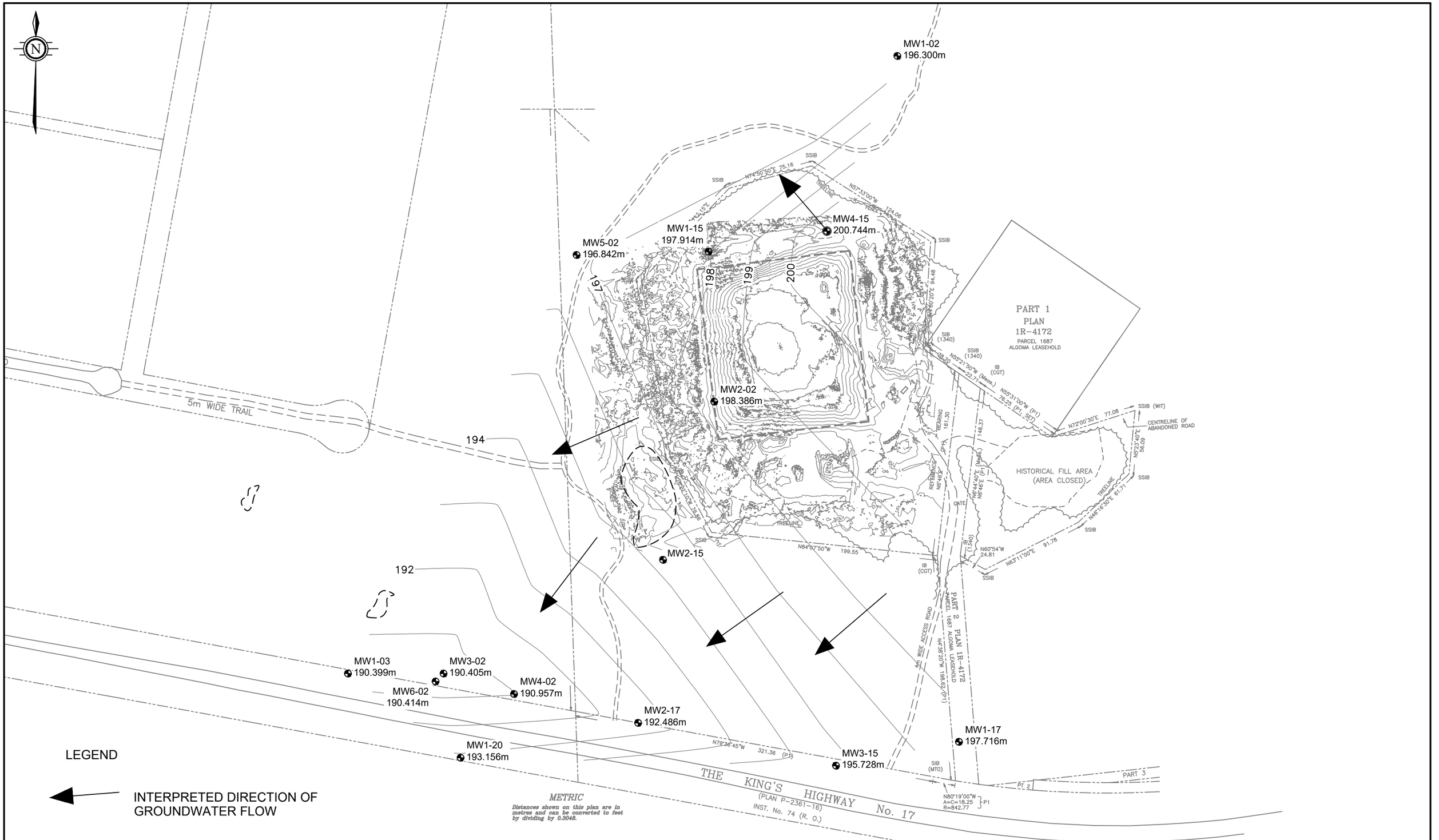
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DRAWN	K.SHERLOCK	02/2024
CHECKED	J. SHARPE	02/2024
PROJECT	2331	
FILENAME	2331 report drawings.dwg	
SCALE	1:3000	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

GROUNDWATER CONTOURS - SPRING 2023

B5

Rev 0



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Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

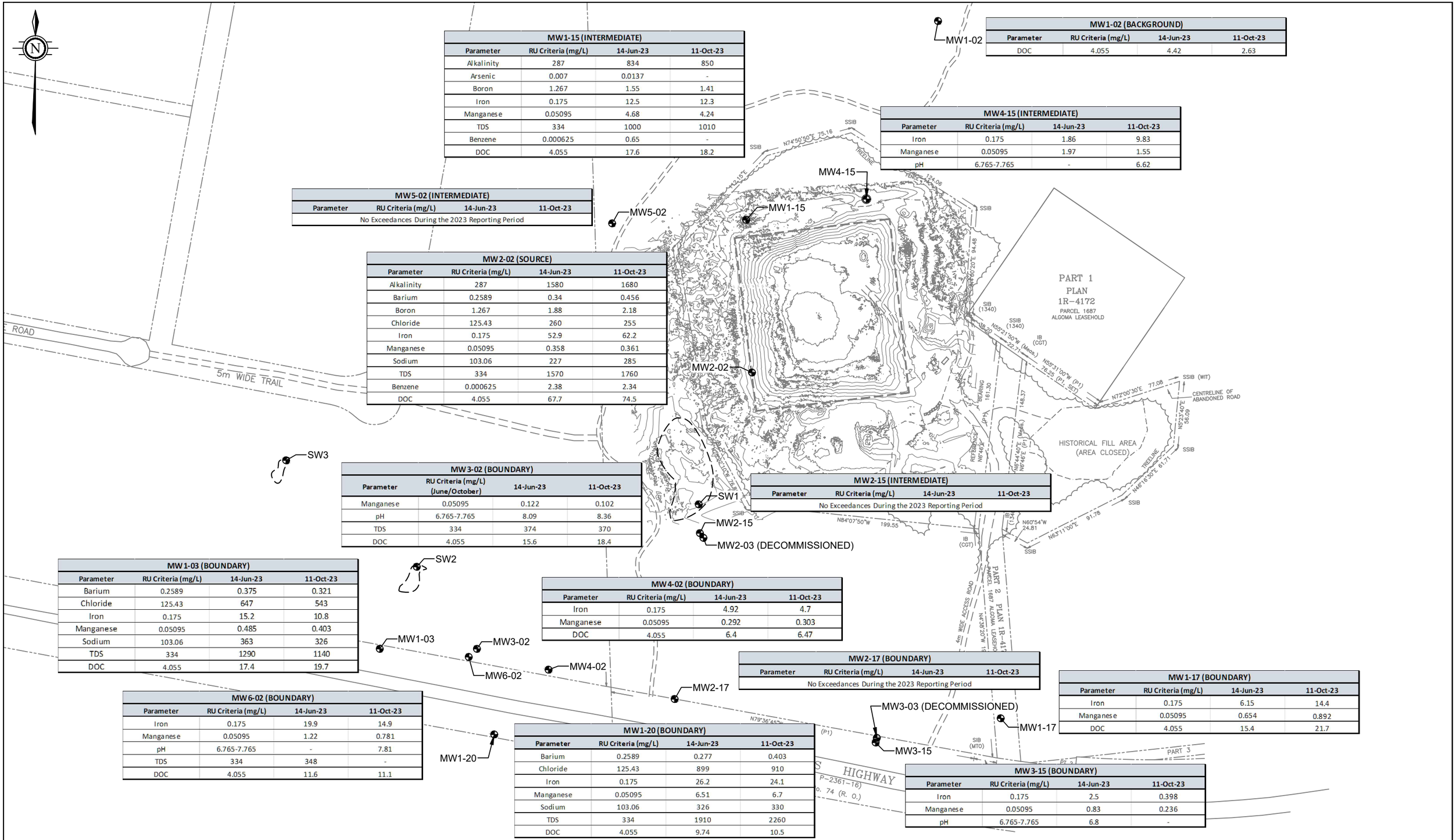
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DRAWN	K.SHERLOCK	02/2024
CHECKED	J. SHARPE	02/2024
PROJECT	2331.03	
FILENAME	2331 report drawings.dwg	
SCALE	1:3000	

TOWN OF BLIND RIVER MUNICIPAL LANDFILL SITE

GROUNDWATER CONTOURS - FALL 2023

B6

Rev 0



MW1-15 (INTERMEDIATE)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
Alkalinity	287	834	850
Arsenic	0.007	0.0137	-
Boron	1.267	1.55	1.41
Iron	0.175	12.5	12.3
Manganese	0.05095	4.68	4.24
TDS	334	1000	1010
Benzene	0.000625	0.65	-
DOC	4.055	17.6	18.2

MW1-02 (BACKGROUND)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
DOC	4.055	4.42	2.63

MW4-15 (INTERMEDIATE)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
Iron	0.175	1.86	9.83
Manganese	0.05095	1.97	1.55
pH	6.765-7.765	-	6.62

MW5-02 (INTERMEDIATE)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
No Exceedances During the 2023 Reporting Period			

MW2-02 (SOURCE)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
Alkalinity	287	1580	1680
Barium	0.2589	0.34	0.456
Boron	1.267	1.88	2.18
Chloride	125.43	260	255
Iron	0.175	52.9	62.2
Manganese	0.05095	0.358	0.361
Sodium	103.06	227	285
TDS	334	1570	1760
Benzene	0.000625	2.38	2.34
DOC	4.055	67.7	74.5

MW3-02 (BOUNDARY)			
Parameter	RU Criteria (mg/L) (June/October)	14-Jun-23	11-Oct-23
Manganese	0.05095	0.122	0.102
pH	6.765-7.765	8.09	8.36
TDS	334	374	370
DOC	4.055	15.6	18.4

MW2-15 (INTERMEDIATE)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
No Exceedances During the 2023 Reporting Period			

MW1-03 (BOUNDARY)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
Barium	0.2589	0.375	0.321
Chloride	125.43	647	543
Iron	0.175	15.2	10.8
Manganese	0.05095	0.485	0.403
Sodium	103.06	363	326
TDS	334	1290	1140
DOC	4.055	17.4	19.7

MW4-02 (BOUNDARY)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
Iron	0.175	4.92	4.7
Manganese	0.05095	0.292	0.303
DOC	4.055	6.4	6.47

MW2-17 (BOUNDARY)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
No Exceedances During the 2023 Reporting Period			

MW1-17 (BOUNDARY)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
Iron	0.175	6.15	14.4
Manganese	0.05095	0.654	0.892
DOC	4.055	15.4	21.7

MW6-02 (BOUNDARY)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
Iron	0.175	19.9	14.9
Manganese	0.05095	1.22	0.781
pH	6.765-7.765	-	7.81
TDS	334	348	-
DOC	4.055	11.6	11.1

MW1-20 (BOUNDARY)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
Barium	0.2589	0.277	0.403
Chloride	125.43	899	910
Iron	0.175	26.2	24.1
Manganese	0.05095	6.51	6.7
Sodium	103.06	326	330
TDS	334	1910	2260
DOC	4.055	9.74	10.5

MW3-15 (BOUNDARY)			
Parameter	RU Criteria (mg/L)	14-Jun-23	11-Oct-23
Iron	0.175	2.5	0.398
Manganese	0.05095	0.83	0.236
pH	6.765-7.765	6.8	-

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

DESIGN	KEC	
DRAWN	K.Sherlock	02/2024
CHECKED	J. SHARPE	
PROJECT	2331	
FILENAME	2331 report drawings.dwg	
SCALE	1:3000	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELLS - RU EXCEEDANCES

B7

Rev 0

Appendix C
Borehole Logs and Photographic Inventory

Log of MW-1

Trow

Auger Sample ⊠
SPT (N) Value ○○ ▨ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢—○
Shelby Tube ●● ■ Undrained Triaxial at 0
Rock Core ⊠ Overburden Press. 15⊕5
Field Vane Test + S % Strain at Failure 10
Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▽

Project: Blind River Monitoring Well Installation — Fig. No. 2
Landfill Site
Blind River, Ontario — Project No. S02403E
Borehole Location and elevation datum shown on Drawing No. 1

OW	GWL	SYMBOL	Soil Description	Depth Below Grade m	DEPTH
Grout →			TOPSOIL, ~130 mm thick over	0.13	0
			SAND & GRAVEL, light brown, wet. (compact)		
Bentonite →			**SILTY SAND & GRAVEL**, occasional cobbles from ~1.1 to 1.6 m depth, light brown, wet. (compact)	0.70	1
Sand Pack →				2.10	2
			TILL, silty sand & gravel, cobble layers from ~2.6 to 3.0 m & from 3.5 to 3.8 m depths, grey, wet. (very dense)		
Monitoring Well →					3
					4
			END OF BOREHOLE	4.60	

N Value (20 40 60 80) / Shear Strength
O/150 mm
O/150 mm
O/75 mm

Natural Moisture Content and Atterberg Limits % Dry Weight (10 20 30)

Natural Unit Weight kN/m³

LBHMI3 S02403E GPJ 09/09/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced using continuous flight hollow stem augering equipment on May 6, 2002.
3. Monitoring well installed to ~4.26 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS

Measurement date	Water Elevation (m)

Log of MW-2

Trow

Auger Sample ⊠
SPT (N) Value ○○ ⊡ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢—○
Shelby Tube ●● ■ Undrained Triaxial at 0
Rock Core ⊠ Overburden Press. 15⊕5
Field Vane Test + S % Strain at Failure 10
Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▼

Project: Blind River Monitoring Well Installation — Fig. No. 4
Landfill Site
Blind River, Ontario — Project No. S02403E
Borehole Location and elevation datum shown on Drawing No. 1

OW	GWL	SYMBOL	Soil Description	Depth Below Grade m	DEPTH	N Value / Shear Strength	Natural Moisture Content and Atterberg Limits % Dry Weight	Natural Unit Weight kN/m³
			SAND & GRAVEL FILL,	GL	0	20 40 60 80	10 20 30	
			GARBAGE,	0.30 0.20				
Grout					1			
Bentonite Seal					2			
Drill Cuttings					3	○		
Sand Pack			**ALLUVIUM,** brown, wet. (soft)	3.66	4			
			ORGANICS, with some clay at base. (soft)	4.42	5	○		
Monitoring Well					6	○		
			SILTY CLAY, grey, wet. (stiff)	6.10				
			END OF BOREHOLE	6.55				

LBHM3 S02403E.GPJ 09/09/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced using continuous flight hollow stem augering equipment on May 14, 2002.
3. Monitoring well installed to ~6.09 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS

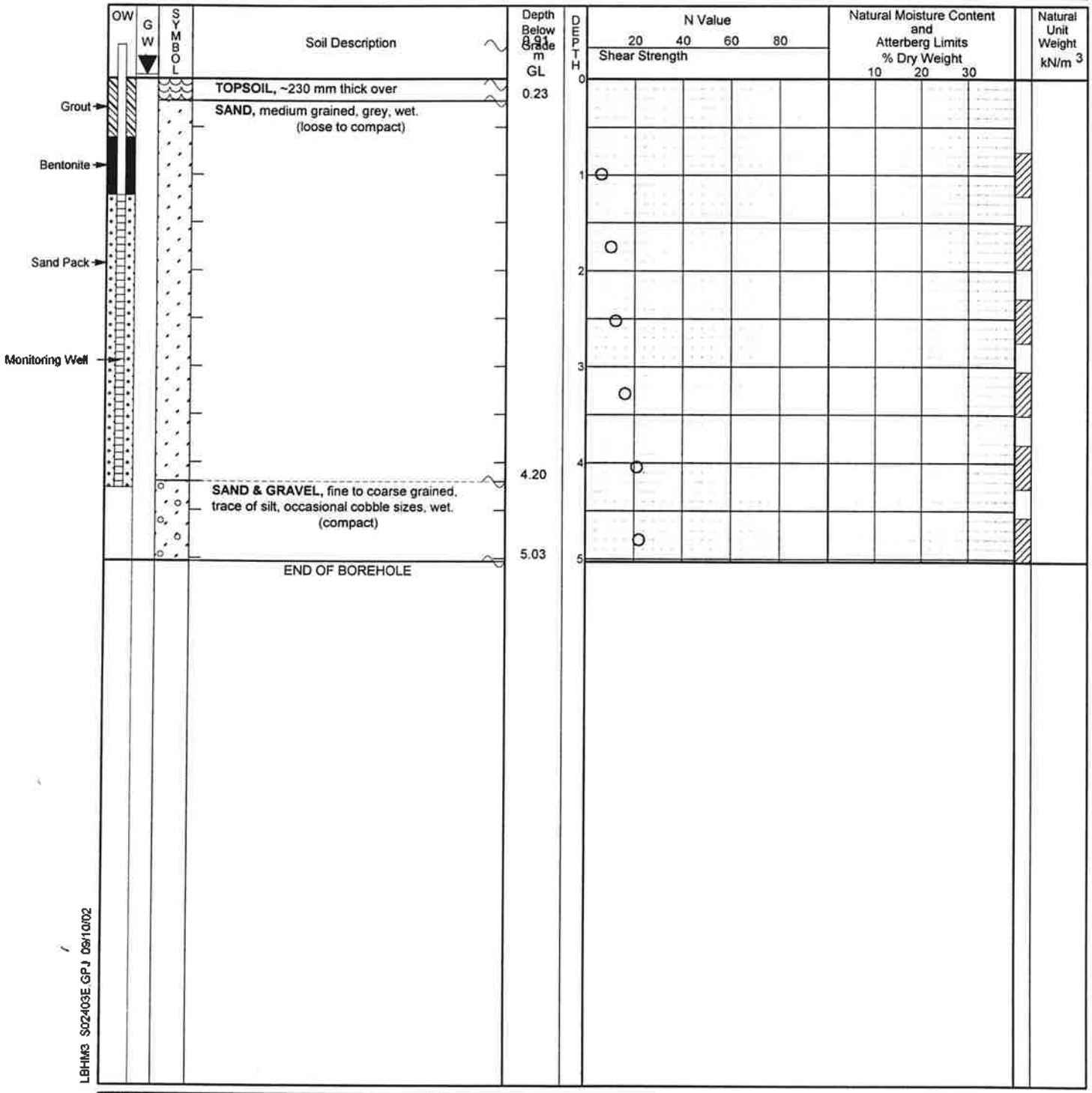
Measurement date	Water Elevation (m)
May 14/02	0.20

Log of MW-3

Trow

Auger Sample ⊠
SPT (N) Value ○○ ▨ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢—○
Shelby Tube ●● ■ Undrained Triaxial at Overburden Press. 0
Rock Core ⊠ % Strain at Failure 15⊕5
Field Vane Test + S Penetrometer 10 ▲
Water Level: Est. ▽ Measured: ▼ Perched: ▽

Project: Blind River Monitoring Well Installation — Fig. No. 5
Landfill Site
Blind River, Ontario — Project No. S02403E
Borehole Location and elevation datum shown on Drawing No. 1



LBHM3 S02403E GPJ 09/10/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced uncased using hand augering equipment on May 14, 2002.
3. Monitoring well installed to ~4.27 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS

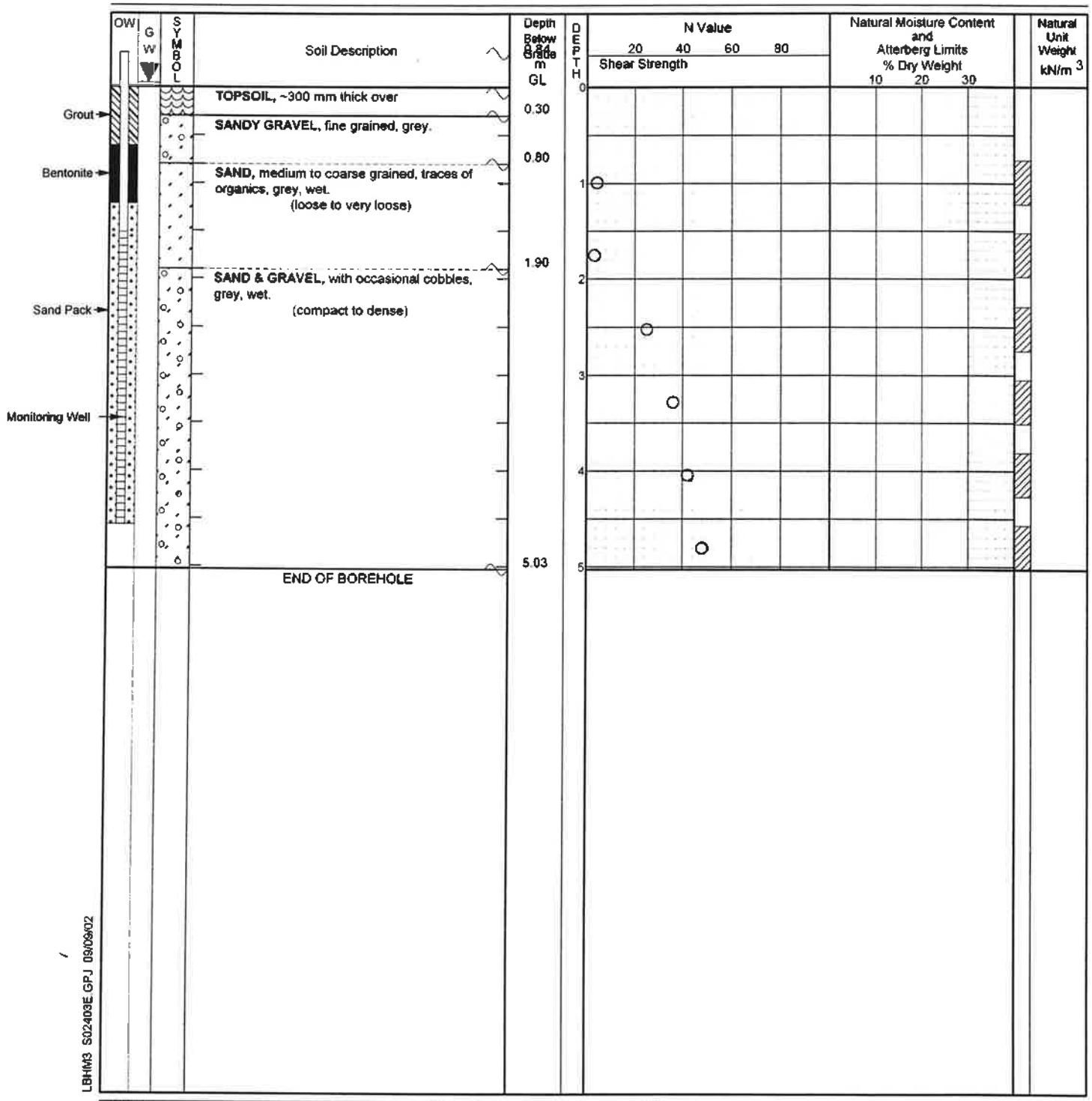
Measurement date	Water Elevation (m)
May 14/02	0.00

Log of MW-4

Trow

Auger Sample ⊠
SPT (N) Value ○○ ▨ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢○
Shelby Tube ●● ■ Undrained Triaxial at Overburden Press. 0 / 15⊕5
Rock Core ⊠ % Strain at Failure 10
Field Vane Test + S Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▽

Project: Blind River Monitoring Well Installation — Fig. No. 6
Landfill Site
Blind River, Ontario — Project No. S02403E
Borehole Location and elevation datum shown on Drawing No. 1



LBHM3 S02403E.GPJ 09/09/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced using continuous flight hollow stem augering equipment on May 14, 2002.
3. Monitoring well installed to ~4.57 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS

Measurement date	Water Elevation (m)
May 14/02	0.00

Log of MW-5

Trow

Auger Sample ⊠
SPT (N) Value ○○ ▨ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢○
Shelby Tube ●● ■ Undrained Triaxial at 0
Rock Core ⊠ Overburden Press. 15⊕5
Field Vane Test + S % Strain at Failure 10
Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▽

Project: Blind River Monitoring Well Installation — Fig. No. 7
Landfill Site
Blind River, Ontario — Project No. S02403E
Borehole Location and elevation datum shown on Drawing No. 1

OW	GWL	SYMBOL	Soil Description	Depth Below Grade m	DEPTH	N Value / Shear Strength	Natural Moisture Content and Atterberg Limits % Dry Weight	Natural Unit Weight kN/m³
Grout →			TOPSOIL, ~150 mm thick over	GL 0.15	0			
			SAND & GRAVEL, alternating layers of light brown and grey, wet, occasional cobble sizes below ~2.3 m depth. (dense becoming very dense with increasing depth)		1			
Bentonite →					2			
Sand Pack →					3	O/75 mm & Bouncing		
Monitoring Well →				4.04	4	O/75 mm		
			END OF BOREHOLE DUE TO AUGER REFUSAL ON BEDROCK OR BOULDER					

N Value: 20 40 60 80
Natural Moisture Content and Atterberg Limits % Dry Weight: 10 20 30

LBHM3 S02403E.GPJ 06/09/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced using continuous flight hollow stem augering equipment on May 6, 2002.
3. Monitoring well installed to ~3.96 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS

Measurement date	Water Elevation (m)

Log of MW-6

Trow

Auger Sample ⊠
SPT (N) Value ○○ ◪ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢—○
Shelby Tube ●● ■ Undrained Triaxial at 0
Rock Core ⊠ Overburden Press. 15⊕5
Field Vane Test + S % Strain at Failure 10
Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▽

Project: Blind River Monitoring Well Installation — Fig. No. 8
Landfill Site
Blind River, Ontario — Project No. S02403E
Borehole Location and elevation datum shown on Drawing No. 1

OW	GW	SYMBOL	Soil Description	Depth Below Grade m / GL	DEPTH
			TOPSOIL, ~250 mm thick over	0.25	0
Grout			**SAND**, medium grained, grey, wet. (loose to compact)		1
Bentonite					2
Sand Pack					3
				4.20	4
Bentonite			**SAND & GRAVEL**, fine to coarse grained, trace of silt to ~6.0 m depth, occasional cobble sizes, wet. (compact)		5
Sand Pack					6
Monitoring Well				7.16	7
			END OF BOREHOLE DUE TO AUGER REFUSAL ON BEDROCK OR BOULDER		

N Value (20 40 60 80) — Shear Strength
Natural Moisture Content and Atterberg Limits % Dry Weight (10 20 30)
Natural Unit Weight kN/m³

○/150 mm & Bouncing

LBHM3 S02403E.GPJ 09/10/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced using continuous flight hollow stem augering equipment on May 14, 2002.
3. Monitoring well installed to ~7.01 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS

Measurement date	Water Elevation (m)
May 14/02	0.00

Log of MW-1

Trow

Auger Sample	⊠	Split Spoon Sample	▨
SPT (N) Value (blows/0.3m)	○	Natural Moisture	×
Dynamic Cone Test	——	Plastic & Liquid Limit	⊢—⊖
Shelby Tube	■	Undrained Triaxial at Overburden Pressure	0 ⊕ 5
Rock Core	⊠	% Strain at Failure	5 10
Field Vane Test & Sensitivity	+ S_u	Pocket Penetrometer	▲
Water Level: Est.: ▽	Measured: ▼	Perched: ▼	

Project: Blind River Landfill — Fig. No. 16

Blind River, Ontario — Project No. S09538G

Hole location and datum see Drawing No. 2

GWL	SYMBOL	Soil Description	Assumed Elev. m	DEPTH	N Value (20 40 60 80) Shear Strength (50 100 kPa)	Natural Moisture Content and Atterberg Limits % Dry Weight (10 20 30)	Sample Type	Natural Unit Weight kN/m³
		TOPSOIL, 200 mm thick.	190.8 190.6	0				
		SAND, brown, wet, loose, well graded, fine to coarse grained, trace silt, trace to some gravel.		1	○			
				2	○	×		
		- grey, compact, poorly graded, medium to coarse grained, some gravel below ~2.3 m depth.		3	○	×		
			167.4					
		END OF BOREHOLE AT ~3.5 m DEPTH.						

Grout

Bentonite

Sand Pack

Observation Well

GEOTECH S09538-1.GPJ 11/20/03

NOTES:
1. Soils log data requires interpretation assistance from Trow before use by others.
2. Borehole advanced using continuous flight hollow stem augers on October 17, 2003.
3. Groundwater not encountered at time of drilling.
4. See Fig. 1A & 1B for Notes on Sample Descriptions.
5. This Drawing to be read with Trow Consulting Engineers Ltd. report S09538G.
6. Borehole logged by S. McAuliffe & Approved by T. Crilly.

WATER LEVEL RECORDS

Date Measured	Water Level Depth Below Grade (m)	Hole Open To (m)

Log of MW-2

Trow

Auger Sample ⊠ Split Spoon Sample ▨
SPT (N) Value (blows/0.3m) ○ Natural Moisture ×
Dynamic Cone Test —— Plastic & Liquid Limit ⊢—○
Shelby Tube ■ Undrained Triaxial at Overburden Pressure 0 / 15⊕5
Rock Core ⊠ % Strain at Failure 10
Field Vane Test & Sensitivity +S= Pocket Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▼

Project Blind River Landfill Fig. No. 17

Blind River, Ontario Project No. S09538G

Hole location and datum see Drawing No. 2

GWL	SYMBOL	Soil Description	Assumed Elev. m GL	DEPTH	N Value / Shear Strength	Natural Moisture Content and Atterberg Limits % Dry Weight	Sample Type	Natural Unit Weight kN/m³
		TOPSOIL, 80 mm thick.	0.1	0	20 40 60 80 / 50 100 kPa	10 20 30		
		SAND, brown, moist, compact, well graded, fine to coarse grained, some cobbles.		1				
		- wet below ~1.52 m depth.	1.6					
		SILTY SAND, brown, wet, compact to dense, poorly graded, coarse grained, some cobbles.		2				
		AUGER REFUSAL ON BEDROCK OR BOULDER AT ~2.29 m DEPTH.	2.3					

Grout
Bentonite
Sand Pack
Observation Well

GEOTECH S09538-1.GPJ 11/20/03

NOTES:
1. Soils log data requires interpretation assistance from Trow before use by others.
2. Borehole advanced using continuous flight hollow stem augers on October 17, 2003.
3. Groundwater not encountered at time of drilling.
4. See Fig. 1A & 1B for Notes on Sample Descriptions.
5. This Drawing to be read with Trow Consulting Engineers Ltd. report S09538G.
6. Borehole logged by S. McAuliffe & Approved by T. Crilly.

WATER LEVEL RECORDS

Date Measured	Water Level Depth Below Grade (m)	Hole Open To (m)

Log of MW-3

Trow

Auger Sample | Split Spoon Sample
SPT (N) Value (blows/0.3m) | Natural Moisture
Dynamic Cone Test | Plastic & Liquid Limit
Shelby Tube | Undrained Triaxial at Overburden Pressure
Rock Core | % Strain at Failure
Field Vane Test & Sensitivity | Pocket Penetrometer
Water Level: Est.: | Measured: | Perched:

Project: Blind River Landfill — Fig. No. 18

Blind River, Ontario — Project No. S09538G

Hole location and datum see Drawing No. 2

Soil Description	Assumed Elev. m	Depth
BOULDERS AND COBBLES, some sand.	198.4	0
SILTY SAND, brown, moist, dense, poorly graded, fine to medium grained. (TILL).	197.7	1
COBBLES, (TILL)	196.9	2
SAND, brown, moist to wet, compact, poorly graded, fine to medium grained, some silt.	196.1	3
- some cobbles below ~2.74 m depth.		4
- wet below ~3.05 m depth.		
END OF BOREHOLE AT ~5.03 m depth.	193.4	5

Grout
Bentonite
Sand Pack
Observation Well

N Value: 20 40 60 80 — Shear Strength: 50 100 kPa

Natural Moisture Content and Atterberg Limits % Dry Weight: 10 20 30

Sample Type

Natural Unit Weight kN/m³

Auger refusal encountered at 0.3 to 0.6 m depth, 4 times in this area prior to drilling this borehole due to presence of boulders and cobbles.

GEOTECH S09538-1.GPJ 11/20/03

NOTES:
1. Soils log data requires interpretation assistance from Trow before use by others.
2. Borehole advanced using continuous flight hollow stem augers on October 17, 2003.
3. Groundwater not encountered at time of drilling.
4. See Fig. 1A & 1B for Notes on Sample Descriptions.
5. This Drawing to be read with Trow Consulting Engineers Ltd. report S09538G.
6. Borehole logged by S. McAuliffe & Approved by T. Crilly.

WATER LEVEL RECORDS

Date Measured	Water Level Depth Below Grade (m)	Hole Open To (m)

MW1–15

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	1567.02
CLIENT	TOWN OF BLIND RIVER	DATE	DECEMBER 2, 2015
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	JS
GROUND ELEVATION	203.151 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE: STRATIGRAPHIC DESCRIPTION	SAMPLE: SAMPLE DEPTH (m)	SAMPLE: BLOW COUNT	MONITORING WELL DETAILS	DEPTH (m)
0.0 – 1.0		MEDIUM GRAINED SAND/SMALL ROCKS/GARBAGE/MOIST			CEMENT	0.0 – 1.0
1.0 – 3.0		CLAY/SILTY SAND/COARSE SAND/WET	2.5 – 3.0	2,4,12,8	WATER TABLE ELEV. 201.346 m; BENTONITE HOLE PLUG	1.0 – 3.0
3.0 – 4.0		SILTY SAND/MEDIUM TO COARSE SAND/WET				3.0 – 4.0
4.0 – 6.0		SILTY SAND/CLAY/WET	5.5 – 6.0	2,2,2,1	SILICA SAND; WELL SCREEN; BOTTOM OF MONITOR WELL AT 197.202 m	4.0 – 6.0
6.0 – 9.0		END OF BOREHOLE AT 6.798 m				6.0 – 9.0

NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 0.849 m; STEEL PROTECTIVE CASING 0.957 m; BOTTOM OF MONITOR WELL INSTALLED AT 5.949 mbgs.

KRESIN Engineering Corporation

DESIGN	. .
DRAWN	. Dec 2015
CHECKED	. .
PROJECT	1567.02
FILENAME	1567.02 well logs
SCALE	NTS

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2015

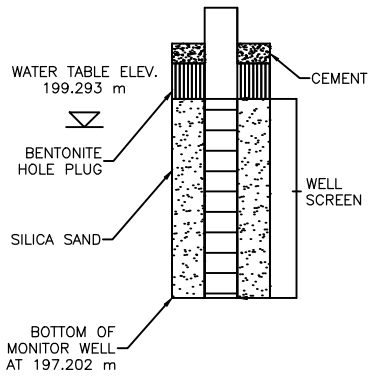
1

Rev 0

MW2–15

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	1567.02
CLIENT	TOWN OF BLIND RIVER	DATE	DECEMBER 1, 2015
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	JS
GROUND ELEVATION	199.933 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE			MONITORING WELL DETAILS	DEPTH (m)
		STRATIGRAPHIC DESCRIPTION	SAMPLE DEPTH (m)	BLOW COUNT		
0.0						0.0
1.0		MEDIUM GRAINED SAND/SMALL ROCKS/MOIST				1.0
2.0		SILTY SAND/MEDIUM TO COARSE SAND/WET				2.0
3.0		END OF BOREHOLE 2.286 m DUE TO AUGER REFUSAL ON BEDROCK OR BOULDER				3.0
4.0						4.0
5.0						5.0
6.0						6.0
7.0						7.0
8.0						8.0
9.0						9.0



NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 1.067 m; STEEL PROTECTIVE CASING 1.202 m; BOTTOM OF MONITOR WELL INSTALLED AT 1.948 mbgs.

ATTEMPTED TO TAKE SAMPLE AT 2.286 m – SPLIT SPOON WOULD NOT ADVANCE (BOUNCE).

KRESIN Engineering Corporation

DESIGN	.	.
DRAWN	.	Dec 2015
CHECKED	.	.
PROJECT	1567.02	
FILENAME	1567.02 well logs	
SCALE	NTS	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2015

2

Rev 0

MW3–15

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	1567.02
CLIENT	TOWN OF BLIND RIVER	DATE	DECEMBER 2, 2015
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	JS
GROUND ELEVATION	196.198 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE			MONITORING WELL DETAILS	DEPTH (m)
		STRATIGRAPHIC DESCRIPTION	SAMPLE DEPTH (m)	BLOW COUNT		
0.0		BOULDERS/COBBLES/SOME SAND			CEMENT	0.0
1.0		SILTY SAND/FINE TO MEDIUM SAND/MOIST			WATER TABLE ELEV. 194.858 m	1.0
2.0		BOULDERS/COBBLES/SOME SAND			BENTONITE HOLE PLUG	2.0
3.0		SILTY SAND/FINE TO MEDIUM SAND/ SOME COBBLES/WET			WELL SCREEN; SILICA SAND/BACKFILL	3.0
4.0						4.0
5.0		END OF BOREHOLE 5.03 m			BOTTOM OF MONITOR WELL AT 191.835 m	5.0
6.0						6.0
7.0						7.0
8.0						8.0
9.0						9.0

NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 0.802 m; STEEL PROTECTIVE CASING 0.921 m; BOTTOM OF MONITORING WELL INSTALLED AT 4.363 mbgs.

BOREHOLE LOCATION WITHIN EXISTING MW3–03 LOCATION, PREVIOUSLY INSTALLED BY TROW ASSOCIATES INC.

BOREHOLE DESCRIPTION FROM GEOTECHNICAL INVESTIGATION – PROPOSED WATER SUPPLY SYSTEM UPGRADE LANDFILL MONITORING WELLS, BLIND RIVER ONTARIO BY TROW ASSOCIATES INC. 2003.

KRESIN Engineering Corporation

DESIGN	.	.
DRAWN	.	Dec 2015
CHECKED	.	.
PROJECT	1567.02	
FILENAME	1567.02 well logs	
SCALE	NTS	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2015

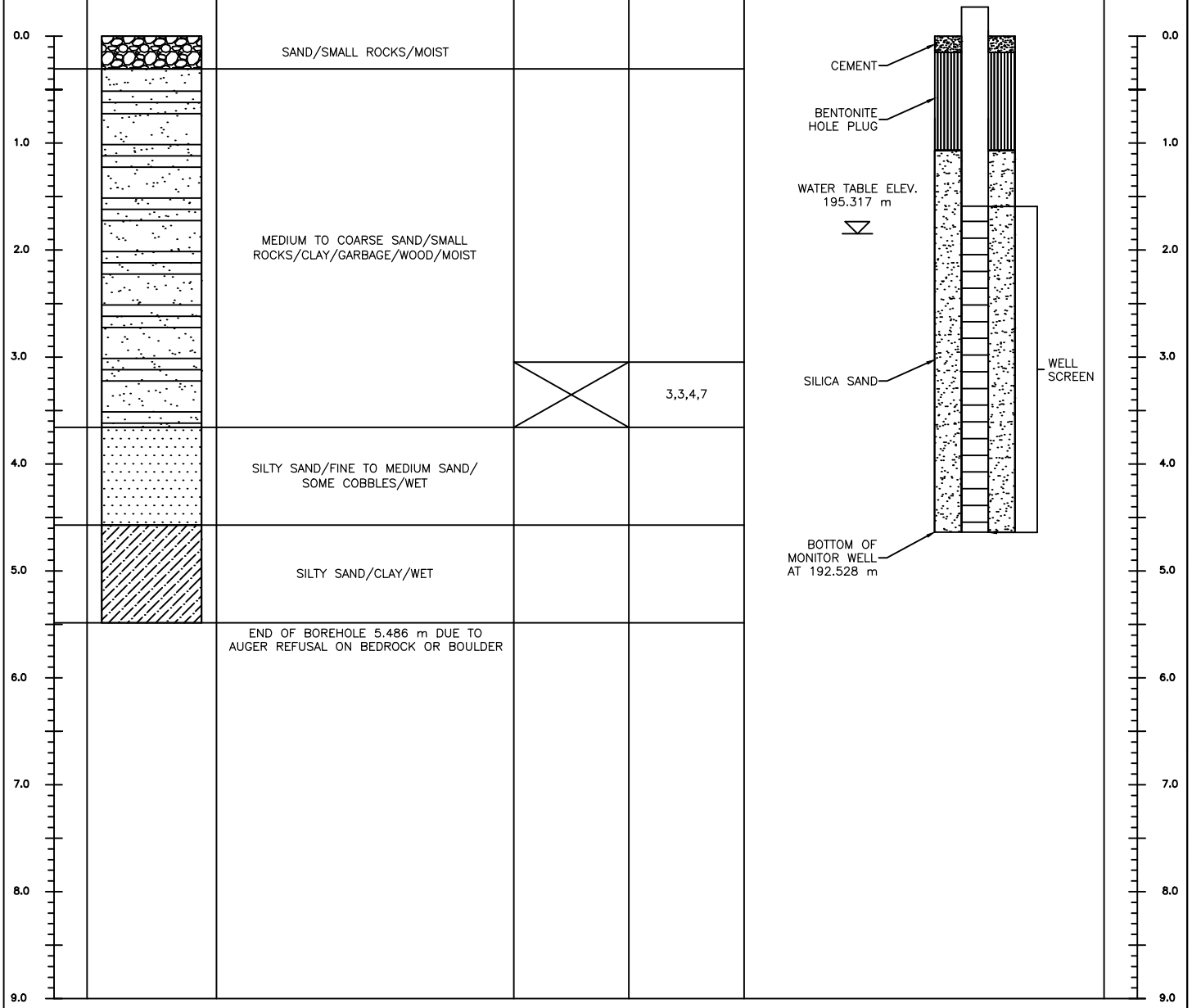
3

Rev 0

MW4–15

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	1567.02
CLIENT	TOWN OF BLIND RIVER	DATE	DECEMBER 1, 2015
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	JS
GROUND ELEVATION	197.165 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE: STRATIGRAPHIC DESCRIPTION	SAMPLE: SAMPLE DEPTH (m)	SAMPLE: BLOW COUNT	MONITORING WELL DETAILS	DEPTH (m)
0.0 – 1.0		SAND/SMALL ROCKS/MOIST			CEMENT; BENTONITE HOLE PLUG	0.0 – 1.0
1.0 – 3.0		MEDIUM TO COARSE SAND/SMALL ROCKS/CLAY/GARBAGE/WOOD/MOIST			WATER TABLE ELEV. 195.317 m	1.0 – 3.0
3.0 – 4.0				3,3,4,7	SILICA SAND; WELL SCREEN	3.0 – 4.0
4.0 – 5.0		SILTY SAND/FINE TO MEDIUM SAND/ SOME COBBLES/WET				4.0 – 5.0
5.0 – 6.0		SILTY SAND/CLAY/WET			BOTTOM OF MONITOR WELL AT 192.528 m	5.0 – 6.0
6.0 – 9.0		END OF BOREHOLE 5.486 m DUE TO AUGER REFUSAL ON BEDROCK OR BOULDER				6.0 – 9.0



NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 0.849 m; STEEL PROTECTIVE CASING 0.957 m; BOTTOM OF MONITORING WELL INSTALLED AT 4.637 mbgs.

KRESIN Engineering Corporation

DESIGN	. .
DRAWN	. Dec 2015
CHECKED	. .
PROJECT	1567.02
FILENAME	1567.02 well logs
SCALE	NTS

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2015

4

Rev 0

MW1-17

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	0508.11
CLIENT	TOWN OF BLIND RIVER	DATE	JULY 12, 2017
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	RW
GROUND ELEVATION	199.034 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE			MONITORING WELL DETAILS	DEPTH (m)
		STRATIGRAPHIC DESCRIPTION	SAMPLE DEPTH (m)	BLOW COUNT		
0.0					CEMENT BENTONITE HOLE PLUG WATER TABLE ELEV. 198.090 m WELL SCREEN SILICA SAND BOTTOM OF MONITOR WELL AT 196.596 m	0.0
1.0		COBBLES/GRAVEL/FINE SAND/DRY				1.0
2.0		COBBLES/GRAVE/FINE SAND/WET				2.0
3.0						3.0
4.0						4.0
5.0						5.0
6.0						6.0
7.0						7.0
8.0						8.0
9.0						9.0

NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 0.815 m; STEEL PROTECTIVE CASING 0.940 m; BOTTOM OF MONITOR WELL INSTALLED AT 2.438 mbgs.

COBBLES PREVENTED SPLIT SPOON SAMPLE COLLECTION.

KRESIN Engineering Corporation

DESIGN	.	.
DRAWN	JS	Oct 2017
CHECKED	.	.
PROJECT	0508.11	
FILENAME	0508.11 well log	
SCALE	NTS	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2017

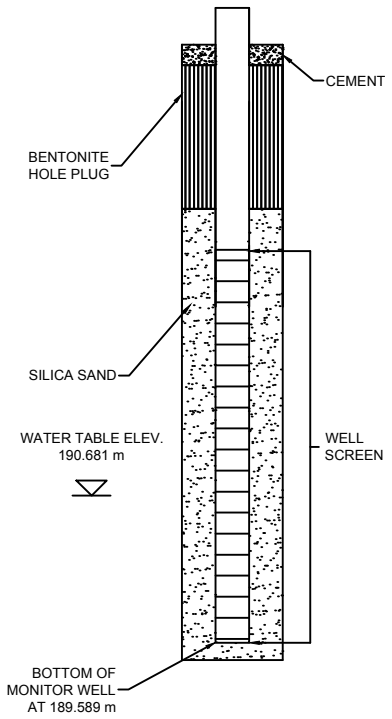
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Rev 0

MW2-17

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	0508.11
CLIENT	TOWN OF BLIND RIVER	DATE	JULY 12, 2017
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	RW
GROUND ELEVATION	194.034 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE			MONITORING WELL DETAILS	DEPTH (m)
		STRATIGRAPHIC DESCRIPTION	SAMPLE DEPTH (m)	BLOW COUNT		
0.0						0.0
1.0		FINE SAND/DRY				1.0
2.0		MEDIUM SAND/WET				2.0
3.0				1,6,9,6		3.0
4.0		MEDIUM SAND/WET				4.0
5.0						5.0
6.0						6.0
7.0						7.0
8.0						8.0
9.0						9.0



NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 0.78 m; STEEL PROTECTIVE CASING 0.94 m; BOTTOM OF MONITOR WELL INSTALLED AT 4.445 mbgs.

KRESIN Engineering Corporation

DESIGN	.	.
DRAWN	JS	Oct 2017
CHECKED	.	.
PROJECT	0508.11	
FILENAME	0508.11 well log	
SCALE	NTS	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2017

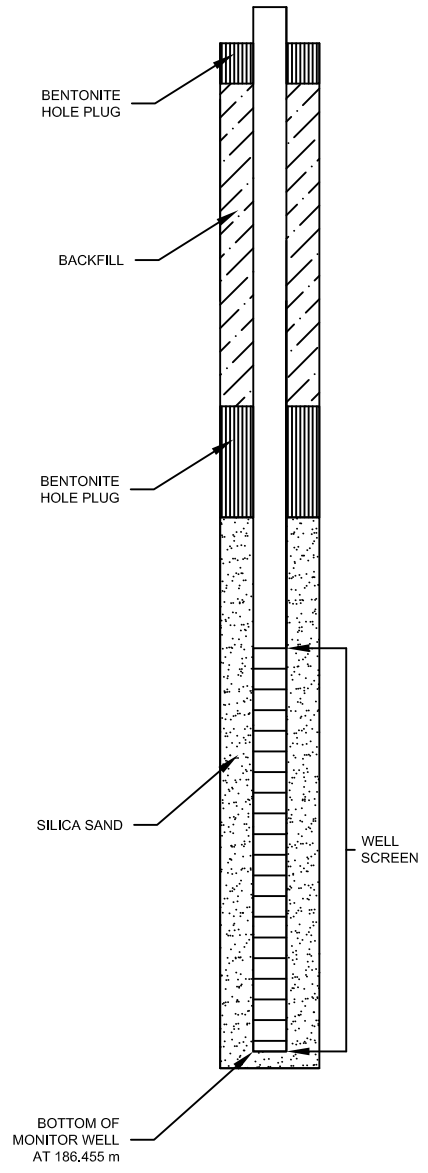
2

Rev 0

MW1-20

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	2049.02
CLIENT	TOWN OF BLIND RIVER	DATE	September 1, 2020
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	JS
GROUND ELEVATION	194.034 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE: STRATIGRAPHIC DESCRIPTION	SAMPLE: SAMPLE DEPTH (m)	SAMPLE: BLOW COUNT	MONITORING WELL DETAILS	DEPTH (m)
0.0						0.0
		ORGANIC MATERIAL/FINE SANDY SILT/WET				
1.0						1.0
		DENSE SILTY CLAY/WET				
2.0						2.0
		LOOSE SILTY CLAY/WET				
3.0						3.0
4.0						4.0
		DENSE SILTY CLAY/WET				
5.0						5.0
		DENSE SILTY CLAY/SMALL COBBLES/WET				
6.0						6.0
		DENSE SILTY CLAY/WET				
7.0						7.0
8.0						8.0
9.0						9.0



NOTES: BOTTOM OF WELL SCREEN IS CAPPED

WELL STICK UP 0.853 m; STEEL PROTECTIVE CASING 0.915 m; BOTTOM OF MONITOR WELL INSTALLED AT 7.62 mbgs.

KRESIN Engineering Corporation

DESIGN	.	.
DRAWN	JS	Sept 2020
CHECKED	.	.
PROJECT	2049.02	
FILENAME	2049..02 MW1-20 well log	
SCALE	NTS	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2020

1-20

Rev 0



Figure C.1. Monitoring location MW1-02



Figure C.2. Monitoring location MW1-02



Figure C.3. Monitoring location MW2-02



Figure C.4. Monitoring location MW2-02



Figure C.5. Monitoring location MW3-02



Figure C.6. Monitoring location MW3-02



Figure C.7. Monitoring location MW4-02



Figure C.8. Monitoring location MW4-02



Figure C.9. Monitoring location MW5-02



Figure C.10. Monitoring location MW5-02



Figure C.11. Monitoring location MW6-02



Figure C.12. Monitoring location MW6-02



Figure C.13. Monitoring location MW1-03



Figure C.14. Monitoring location MW1-03



Figure C.15. Monitoring location MW1-15



Figure C.16. Monitoring location MW1-15



Figure C.17. Monitoring location MW2-15



Figure C.18. Monitoring location MW2-15



Figure C.19. Monitoring Location MW3-15



Figure C.20. Monitoring Location MW3-15



Figure C.21. Monitoring location MW4-15



Figure C.22. Monitoring location MW4-15



Figure C.23. Monitoring location MW1-17



Figure C.24. Monitoring location MW1-17



Figure C.25. Monitoring location MW2-17



Figure C.26. Monitoring Location MW2-17



Figure C.27. Monitoring location MW1-20



Figure C.28. Monitoring location MW1-20



Figure C.29. Surface water location SW1



Figure C.30. Surface water location SW2



Figure C.31. Surface water location SW3



Figure C.32. Surface water location SW4



Figure C.33. Surface water location SW5



Figure C.34. Surface water location SW6



Figure C.3. Surface water location SW7

Appendix D
Observation Well and Surface Water Sampling Protocol

GROUNDWATER MONITORING AND SAMPLING PROTOCOL

1.0 EQUIPMENT PREPARATION

1. All field instruments shall be calibrated according the manufacturer specifications before each sampling event.

2. Sample bottles obtained from the analyzing laboratory shall be inspected for damage and to ensure that all required bottles are present.

2.0 WATER LEVEL MEASUREMENTS

1. If visiting the groundwater location for the first time or if not already collected, record GPS coordinates of the groundwater location.

2. Prior to purging/sampling, water levels shall be measured with the electronic tape.

3. Water level measurements shall be taken without the removal of the dedicated sampling device (tubing and foot-valve arrangements).

4. Water level and well depth measurements shall be taken from the top of the monitoring well. The measurement will be taken from the top of the PVC pipe and not the top of the steel protective casing or the ground level.

5. Measurements shall be recorded.

6. Thoroughly clean the measuring device after taking measurements in each monitor to eliminate contamination between wells.

3.0 PURGING PROCEDURE

1. Prior to sampling, each well shall be purged to remove the stagnant water within the well casing, to allow the sampling to be of fresh groundwater.

2. The volume of standing water in each monitoring well shall be calculated from the recorded static level and the total well depth and recorded. (For a 50 mm diameter well casing, 1 metre of water column = 2 L of water).

3. Three casing volumes shall be removed using the dedicated samplers. The purged water shall be measured into a calibrated container and the volume removed shall be recorded for each well. Slow inflow monitors shall be purged completely dry. The volume of purged water shall be recorded for each well. The water that is purged should be retained to be used for samples ONLY IF the well does not recover to allow sampling. If the purged water is used as a sample it must be clearly labelled as such.

4. Conductivity, temperature pH and dissolved oxygen values shall be field measured and recorded after the removal of each casing volume to confirm that the parameters have stabilized.

4.0 SAMPLING/SUBMISSION PROCEDURE

1. Suitable sample bottles (containing pre-measured preservatives, as required) shall be obtained from the analyzing laboratory in advance of the sampling program.

2. Field blank samples shall be collected during the same time and at the same location during the sampling program. Field blanks shall be collected in a similar manner as the sample but without using the groundwater collection equipment. Distilled water shall be used for submitting field blanks to the laboratory.

3. The number and type of field and spiked blanks shall be determined by prior consultation with the laboratory representative.

4. If possible, samples shall be collected the day following the purging exercise (to permit water-level recovery in the slower responding monitors) by means of the dedicated samplers in each monitor well.

5. Samples collected for metal determinations (which include iron and manganese) shall be field filtered before placement into the sample bottle containing acid preservative. If appreciable sediment is encountered in the sample and filtering cannot be undertaken, a sample should be collected in a clean bottle without preservative, and the sediment shall be allowed to settle before a sample is decanted for submission to a laboratory for subsequent filtering/acidification.

6. Sample bottles for volatile organics shall completely fill the sample bottle, without any air (head) space.

7. Each sample bottle shall be labelled to indicate the project name, well number, time of sample collection, preservatives added and analyses to be performed.

8. Place samples into a cooler with pre-frozen ice packs and deliver to the laboratory within 24 hours after the completion of the sampling program.

9. A Chain of Custody form shall be completed and submitted together with the samples to the laboratory.

SURFACE WATER MONITORING AND SAMPLING PROTOCOL

1. If visiting the surface water location for the first time or if not already collected, record GPS coordinates of the surface water location.

2. Disposable latex gloves shall be worn throughout the sampling procedure.

3. Conductivity, temperature, pH and dissolved oxygen shall be field measured and recorded at each sampling location.

4. If required, QA/QC blanks shall be obtained from the analyzing laboratory in advance of the sampling program. The number and type of blanks shall be determined by prior consultation with a laboratory representative.

5. Suitable sample bottles (containing pre-measured preservatives, as required) shall be obtained from the analyzing laboratory in advance of the sampling program and shall be assigned a unique sample number.

6. Samples shall be collected by partially submerging the sample bottles into the surface water, making sure to not overflow the bottles or flushing out any preservative.

7. Any observations made during sample collection shall be recorded.

8. Each sample bottle shall be labelled to indicate the project name, well number, time of sample collection, preservatives added and analyses to be performed.

9. Samples shall be placed into a cooler with pre-frozen ice packs and delivered to the laboratory within 24 hours after the completion of the sampling program.

10. A Chain of Custody form shall be completed and submitted together with the samples to the laboratory.

Appendix E
Field Record Sheets

MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill
WEATHER: sunny, hot
KEC Project: 2321.01
RECORDERS: JS/KS
DESCRIPTION: MW1-02
GPS INFO:
DATE & TIME: June 14, 2023

Total depth of well from top of casing: 5.205 m (a)
Depth to water from top of casing: 1.364 m (b)
Height of casing above ground 0.912 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 23 Litres

Purged 9 Litres

Meter Readings

ph	5.95
DO	25.4 %
EC	0.211
Temp.	8.3°C

Recovery Time of Well

Observation No.	Time	Depth
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		

Observation No.	Time	Depth
15		
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill WEATHER: Overcast, hot

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: MW2-02 GPS INFO:

DATE & TIME: June 14, 2023 4:00pm

Total depth of well from top of casing: 6.404 m (a)

Depth to water from top of casing: 2.263 m (b)

Height of casing above ground 0.681 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = 24 Litres

Purged 24 Litres

Meter Readings

ph	6.61
DO	22.4%
EC	3.237 mS
Temp.	11.6 °C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Bird River Landfill
WEATHER: Sunny, 16°C
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: MW3-02
GPS INFO:
DATE & TIME: June 14, 2023 10:53am

Total depth of well from top of casing: 1.738 m (a)
Depth to water from top of casing: 0.991 m (b)
Height of casing above ground 0.912 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 4 Litres

Purged 1 Litres

Meter Readings

ph	6.52
DO	68%
EC	0.680 mS
Temp.	14.6°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: Sunny, hot
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: MW4-02
GPS INFO:
DATE & TIME: June 14, 2023

Total depth of well from top of casing: 4.970 m (a)
Depth to water from top of casing: 1.055 m (b)
Height of casing above ground 0.796 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 23 Litres

Meter Readings

ph	6.33
DO	19.3%
EC	0.421
Temp.	9.0°C

Purged 10 Litres

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Bird River Landfill WEATHER: Sunny, hot

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: MW5-02 GPS INFO:

DATE & TIME: June 14, 2023 2:13pm

Total depth of well from top of casing:	4.626	m	(a)
Depth to water from top of casing:	1.125	m	(b)
Height of casing above ground	0.795	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = 20 Litres

Meter Readings

ph	6.41
DO	66.7%
EC	0.126 mS
Temp.	9.5°C

Purged 5 Litres

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill — WEATHER: Sunny, 16°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: MW16-02 — GPS INFO:

DATE & TIME: June 14, 2023

Total depth of well from top of casing:	7.430	m	(a)
Depth to water from top of casing:	1.324	m	(b)
Height of casing above ground	0.805	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = 36 Litres

Purged 14 Litres

Meter Readings

ph	6.57
DO	27.2%
EC	0.678 mS
Temp.	8.0°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River landfill
WEATHER: Sunny, 16°C
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: MW1-03
GPS INFO:
DATE & TIME: June 14, 2023 10:33am

Total depth of well from top of casing: _____ m (a)
Depth to water from top of casing: 1.048 m (b)
Height of casing above ground 1.017 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = 14 Litres

Purged 14 Litres

Meter Readings

ph	5.87
DO	35.9 %
EC	2.323 mS
Temp.	8.7 °C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Black River Landfill
WEATHER: overcast, hot
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: MW1-15
GPS INFO:
DATE & TIME: June 14, 2023 2:55pm

Total depth of well from top of casing: 6.728 m (a)
Depth to water from top of casing: 2.406 m (b)
Height of casing above ground 0.852 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = 25 Litres

Meter Readings

ph	5.92
DO	16.6%
EC	1.523mS
Temp.	10°C

Purged 25 Litres

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill WEATHER: overcast, hot

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: MW2-15 GPS INFO:

DATE & TIME: June 14, 2023 4:33pm

Total depth of well from top of casing: 3.007 m (a)

Depth to water from top of casing: 2.473 m (b)

Height of casing above ground 1.046 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 3 Litres

Meter Readings

ph	7.36
DO	82%
EC	0.092mS
Temp.	13.7°C

Purged 0.5 Litres

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill WEATHER: Sunny, 16°C

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: MW3-15 GPS INFO:

DATE & TIME: June 14, 2023 12:30pm

Total depth of well from top of casing: 5.246 m (a)

Depth to water from top of casing: 2.615 m (b)

Height of casing above ground 0.750 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = 15 Litres

Purged 5 Litres

Meter Readings

ph	6.15
DO	32.4%
EC	0.109mS
Temp.	10.1 °C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill WEATHER: sunny, hot

KEC Project: 2331.03 RECORDERS: JS, KS

DESCRIPTION: MW4-15 GPS INFO:

DATE & TIME: June 14, 2023 2:34 pm

Total depth of well from top of casing:	0.820	m	(a)
Depth to water from top of casing:	2.682	m	(b)
Height of casing above ground	5.464	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 16 Litres

Purged 16 Litres

Meter Readings

ph	6.20
DO	27.5%
EC	0.127 mS
Temp.	9.2°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River, landfill WEATHER: sunny, 16°c

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: MW1-17 GPS INFO:

DATE & TIME: June 14, 2023 10:04am

Total depth of well from top of casing:	3.052	m	(a)
Depth to water from top of casing:	1.675	m	(b)
Height of casing above ground	0.874	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = 8 Litres

Purged 1 Litres

Meter Readings

ph	5.52
DO	46.8 %
EC	0.313mS
Temp.	11.8°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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*Duplicate @ 9:45am

MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: Sunny, 16°C
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: MW2-17
GPS INFO:
DATE & TIME: June 14, 2023 9:36am

Total depth of well from top of casing:	5.161	m	(a)
Depth to water from top of casing:	1.966	m	(b)
Height of casing above ground	0.752	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 18 Litres

Purged 18 Litres

Meter Readings

ph	5.62
DO	52.0%
EC	0.187mS
Temp.	8.2°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill
WEATHER: Sunny, 16°C
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: MW1-20
GPS INFO:
DATE & TIME: June 14, 2023 11:35am

Total depth of well from top of casing: 8.366 m (a)
Depth to water from top of casing: 1.493 m (b)
Height of casing above ground 0.872 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 40 Litres

Meter Readings

ph	6.12
DO	20.1 %
EC	2.640 mS
Temp.	8.2°C

Purged 40 Litres

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Bird River Land Fill WEATHER: overcast, hot

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: SW1 GPS INFO:

DATE & TIME: June 14, 2023 4:45pm

Total depth of well from top of casing: — m (a)

Depth to water from top of casing: — m (b)

Height of casing above ground — m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = —Litres

Purged —Litres

Meter Readings

ph	7.58
DO	142.1%
EC	0.802mS
Temp.	22.4°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill WEATHER: Overcast, hot

KEC Project: 2331.01 RECORDERS: JS / KS

DESCRIPTION: SW2 GPS INFO:

DATE & TIME: June 14, 2023 5:27pm

Total depth of well from top of casing: - m (a)

Depth to water from top of casing: - m (b)

Height of casing above ground - m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = ____ - ____ Litres

Purged ____ - ____ Litres

Meter Readings

ph	7.82	
DO	114 %	
EC	0.301 mS	
Temp.	19.7 °C	

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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* Field Blank 5:42pm

MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: overcast, Rot
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: SW3
GPS INFO:
DATE & TIME: June 14, 2023

Total depth of well from top of casing: ' m (a)
Depth to water from top of casing: DRY m (b)
Height of casing above ground m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = _____Litres

Purged _____Litres

Meter Readings

ph _____
DO _____
EC _____
Temp. _____

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill WEATHER: overcast, hot

KEC Project: 2331_01 RECORDERS: JS/KS

DESCRIPTION: SW4 GPS INFO:

DATE & TIME: June 14, 2023 5:10pm

Total depth of well from top of casing: — m (a)

Depth to water from top of casing: — m (b)

Height of casing above ground - m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = — Litres

Purged — Litres

Meter Readings

ph	7.35
DO	70.5 %
EC	0.674 mS
Temp.	20.6 °C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: overcast, light

KEC Project: 2331.01
RECORDERS: JS/KS

DESCRIPTION: SW5
GPS INFO:

DATE & TIME: June 14, 2023

Total depth of well from top of casing: — m (a)

Depth to water from top of casing: DRY m (b)

Height of casing above ground _____ m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = _____Litres

Purged _____Litres

Meter Readings

ph _____

DO _____

EC _____

Temp. _____

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill WEATHER: overcast, hot

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: SW6 GPS INFO:

DATE & TIME: June 14, 2023 1:56pm

Total depth of well from top of casing: - m (a)

Depth to water from top of casing: - m (b)

Height of casing above ground - m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = -_____Litres

Purged -_____Litres

Meter Readings

ph	6.53
DO	150.9%
EC	0.093mS
Temp.	23.5°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill WEATHER: overcast, hot

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: SW7 GPS INFO:

DATE & TIME: June 14, 2023 5:56pm

Total depth of well from top of casing: – m (a)

Depth to water from top of casing: – m (b)

Height of casing above ground – m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = – Litres

Meter Readings

ph	7.38
DO	39.8%
EC	0.958
Temp.	16.6°C

Purged – Litres

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill
WEATHER: Sunny, 26°C
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: SW1
GPS INFO:
DATE & TIME: Aug. 8, 2023

Total depth of well from top of casing: _____ m (a)
Depth to water from top of casing: / m (b)
Height of casing above ground _____ m
DRY

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = _____Litres

Purged _____Litres

Meter Readings

ph _____
DO _____
EC _____
Temp. _____

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill WEATHER: Sunny, 26°C

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: SW2 GPS INFO:

DATE & TIME: Aug. 8, 2023 1:00pm

Total depth of well from top of casing: - m (a)

Depth to water from top of casing: - m (b)

Height of casing above ground - m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = - Litres

Purged - Litres

Meter Readings

ph	8.01
DO	95.9%
EC	0.494 mS
Temp.	25.4°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: Sunny, 26 °C
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: SW3
GPS INFO:
DATE & TIME: Aug. 8, 2023

Total depth of well from top of casing: _____ m (a)
Depth to water from top of casing: DRY m (b)
Height of casing above ground _____ m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = _____Litres

Purged _____Litres

Meter Readings

ph _____
DO _____
EC _____
Temp. _____

Recovery Time of Well

Observation No.	Time	Depth
1		
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: sunny, 26°C
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: SW4
GPS INFO:
DATE & TIME: Aug. 8, 2023 12:05pm

Total depth of well from top of casing: — m (a)
Depth to water from top of casing: — m (b)
Height of casing above ground — m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = _____Litres

Purged —Litres

Meter Readings

ph	7.65
DO	82.7 %
EC	0.593 mS
Temp.	28.9°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: Sunny, 26°C
KEC Project: 2331-01
RECORDERS: JS/KS
DESCRIPTION: SW5
GPS INFO:
DATE & TIME: Aug. 8, 2023

Total depth of well from top of casing: / m (a)
Depth to water from top of casing: DRY m (b)
Height of casing above ground m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = _____Litres

Purged _____Litres

Meter Readings

ph _____
DO _____
EC _____
Temp. _____

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill
WEATHER: Sunny, 26°C
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: SW6
GPS INFO:
DATE & TIME: Aug. 8, 2023 11:14am

Total depth of well from top of casing: – m (a)
Depth to water from top of casing: – m (b)
Height of casing above ground – m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = –Litres

Purged –Litres

Meter Readings

ph	7.96
DO	101.4 %
EC	0.192 mS
Temp.	22.8 °C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill WEATHER: Sunny, 26°C

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: SW7 GPS INFO:

DATE & TIME: Aug. 8, 2023 1:31 pm

Total depth of well from top of casing: - m (a)

Depth to water from top of casing: - m (b)

Height of casing above ground - m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = - Litres

Purged - Litres

Meter Readings

ph	7.00
DO	77.7 %
EC	1.815 mS
Temp.	25.7 °C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill WEATHER: 18°c, overcast

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: SW1 GPS INFO:

DATE & TIME: Sept. 11, 2023 11:38am

Total depth of well from top of casing: — m (a)

Depth to water from top of casing: - m (b)

Height of casing above ground — m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = _____ Litres

Purged _____ Litres

Meter Readings

ph	7.39
DO	92.6 %
EC	1.047 mS
Temp.	18.9°c

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill WEATHER: 18°C, overcast

KEC Project: 2332.01 RECORDERS: JS/KS

DESCRIPTION: SW 2 GPS INFO:

DATE & TIME: Sept. 11, 2023 1:34

Total depth of well from top of casing: - m (a)

Depth to water from top of casing: - m (b)

Height of casing above ground - m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = -Litres

Purged -Litres

Meter Readings

ph	7.38
DO	94.5%
EC	0.536 mS
Temp.	19.5°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: overcast, 18°c
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: SW3
GPS INFO:
DATE & TIME: Sept. 11, 2023

Total depth of well from top of casing: / m (a)
Depth to water from top of casing: DRY m (b)
Height of casing above ground m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = _____Litres

Purged _____Litres

Meter Readings

ph _____
DO _____
EC _____
Temp. _____

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill WEATHER: 18°C, overcast

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: SW4 GPS INFO:

DATE & TIME: Sept. 11, 2023 11:14am

Total depth of well from top of casing: — m (a)

Depth to water from top of casing: — m (b)

Height of casing above ground — m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = _____Litres

Purged —Litres

Meter Readings

ph	7.42
DO	54.5%
EC	0.462mS
Temp.	19.0°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: 18c, overcast
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: SW5
GPS INFO:
DATE & TIME: Sept. 11, 2023

Total depth of well from top of casing: / m (a)
Depth to water from top of casing: Dry m (b)
Height of casing above ground / m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = _____Litres

Purged _____Litres

Meter Readings

ph _____
DO _____
EC _____
Temp. _____

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill
WEATHER: 18°C, overcast
KEC Project: 2231.01
RECORDERS: JS/KS
DESCRIPTION: SW6
GPS INFO:
DATE & TIME: Sept. 11, 2023 10:45am

Total depth of well from top of casing: _____ m (a)
Depth to water from top of casing: _____ m (b)
Height of casing above ground _____ m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = _____Litres

Purged _____Litres

Meter Readings

ph _____
DO _____
EC _____
Temp. _____

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill WEATHER: overcast, 18°C

KEC Project: 2331.01 RECORDERS: JS/KS

DESCRIPTION: SW7 GPS INFO:

DATE & TIME: Sept. 11, 2023 12:45pm

Total depth of well from top of casing: - m (a)

Depth to water from top of casing: - m (b)

Height of casing above ground - m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = _____ Litres

Purged _____ Litres

Meter Readings

ph	6.76
DO	30.1%
EC	1.28mS
Temp.	19.9°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: Partly sunny, 9°C
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: MW1-02
GPS INFO:
DATE & TIME: Oct. 11, 2023 11:52am

Total depth of well from top of casing: 5.204 m (a)
Depth to water from top of casing: 3.328 m (b)
Height of casing above ground 0.919 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 11 Litres

Purged 3 Litres

Meter Readings

ph	6.77
DO	55.1 %
EC	0.169 mS
Temp.	10.5°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill — WEATHER: Overcast, Some rain, 7°C

KEC Project: 2331.01 — RECORDERS: JS/K.S

DESCRIPTION: MW2-02 — GPS INFO:

DATE & TIME: Oct. 11, 2023 2:08pm

Total depth of well from top of casing:	6.405	m	(a)
Depth to water from top of casing:	2.484	m	(b)
Height of casing above ground	0.702	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = 23 Litres

Meter Readings

ph	6.72
DO	19.7%
EC	3.356mS
Temp.	11.3°C

Purged 23 Litres

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill — WEATHER: Overcast, 5°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: MW3-02 — GPS INFO:

DATE & TIME: Oct. 11, 2023 10:05am

Total depth of well from top of casing: 1.738 m (a)

Depth to water from top of casing: 1.089 m (b)

Height of casing above ground 0.911 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 4 Litres

Purged 0.5 Litres

Meter Readings

ph	7.16
DO	85.2 %
EC	0.614 mS
Temp.	10.3 °C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Land Fill — WEATHER: Overcast, 5°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: MW4-02 — GPS INFO:

DATE & TIME: Oct. 11, 2023 10:56am

Total depth of well from top of casing: 4.971 m (a)

Depth to water from top of casing: 1.229 m (b)

Height of casing above ground 0.760 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = 22 Litres

Meter Readings

ph	6.88
DO	40.8 %
EC	0.508 mS
Temp.	10.4°C

Purged 8 Litres

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill — WEATHER: partly sunny, 9°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: MW5-02 — GPS INFO:

DATE & TIME: Oct. 11, 2023 12:19pm

Total depth of well from top of casing:	4.622	m	(a)
Depth to water from top of casing:	1.329	m	(b)
Height of casing above ground	0.795	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 19 Litres

Purged 5 Litres

Meter Readings

ph	7.13
DO	68.5%
EC	0.118 mS
Temp.	10.9°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill **WEATHER:** overcast, 5°c

KEC Project: 2331.01 **RECORDERS:** JS/KS

DESCRIPTION: MW6-02 **GPS INFO:**

DATE & TIME: Oct. 11, 2023 10:20am

Total depth of well from top of casing:	7.435	m	(a)
Depth to water from top of casing:	1.589	m	(b)
Height of casing above ground	0.795	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 34 Litres

Purged 14 Litres

Meter Readings

ph	6.86
DO	39.7%
EC	0.612 mS
Temp.	9.2°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Bird River Landfill — WEATHER: overcast, 5°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: MW1-03 — GPS INFO:

DATE & TIME: Oct. 11, 2023 9:49am

Total depth of well from top of casing:	3.495	m	(a)
Depth to water from top of casing:	1.222	m	(b)
Height of casing above ground	1.038	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 13 Litres

Meter Readings

ph	6.48
DO	22.2%
EC	1.9 mS
Temp.	11.2°C

Purged 13 Litres

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill — WEATHER: sun v cloud, 9°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: MW1-15 — GPS INFO:

DATE & TIME: Oct. 11, 2023 1:10 pm

Total depth of well from top of casing:	6.467	m	(a)
Depth to water from top of casing:	2.663	m	(b)
Height of casing above ground	0.852	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 22 Litres

Meter Readings

ph	6.50
DO	33.2%
EC	1.454mS
Temp.	11.0°C

Purged 22 Litres

Recovery Time of Well

Observation No.	Time	Depth
1		
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3		
4		
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12		
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Observation No.	Time	Depth
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16		
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27		
28		

MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill
WEATHER: overcast, some rain, 7°C
KEC Project: 2331.01
RECORDERS: JS/KS
DESCRIPTION: MW2-15
GPS INFO:
DATE & TIME: Oct. 11, 2023 2:32 pm

Total depth of well from top of casing: 3.008 m (a)
Depth to water from top of casing: -DRY- m (b)
Height of casing above ground 1.034 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = ____ Litres

Purged ____ Litres

Meter Readings

ph	—
DO	—
EC	—
Temp.	—

Recovery Time of Well

Observation No.	Time	Depth
1		
2		
3		
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11		
12		
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Observation No.	Time	Depth
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27		
28		

MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill — WEATHER: Overcast, 5°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: MW3-15 — GPS INFO:

DATE & TIME: Oct. 11, 2023 8:55am

Total depth of well from top of casing: 5.245 m (a)

Depth to water from top of casing: 3.553 m (b)

Height of casing above ground 0.734 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 10 Litres

Purged 2 Litres

Meter Readings

ph	6.36
DO	43.8%
EC	0.116mS
Temp.	10.9°C

Recovery Time of Well

Observation No.	Time	Depth
1		
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Observation No.	Time	Depth
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* Well tubing hard to pull out; Well depth has changed; assumed that well was damaged during ditch construction; still has water but bottom of casing may be damaged.

MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT: Blind River Landfill
KEC Project: 2331.01
DESCRIPTION: MW4-15
DATE & TIME: Oct. 11, 2023 12:48 pm

WEATHER: Sunny w cloud, 9°C
RECORDERS: JS/KS
GPS INFO:

Total depth of well from top of casing:	4.880	m	(a)
Depth to water from top of casing:	3.585	m	(b)
Height of casing above ground	0.749	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 7.6 Litres

Meter Readings

ph	6.15
DO	21.1 %
EC	0.166mS
Temp.	10.7°C

Purged 7.6 Litres

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill **WEATHER:** overcast, 5°C

KEC Project: 2331.01 **RECORDERS:** JS/KS

DESCRIPTION: MW1-17 **GPS INFO:**

DATE & TIME: Oct. 11, 2023 9:30am

Total depth of well from top of casing: 3.058 m (a)

Depth to water from top of casing: 2.202 m (b)

Height of casing above ground 0.884 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = 5 Litres

Meter Readings

ph	6.68
DO	67.2%
EC	0.275 mS
Temp.	11.4°C

Purged 0.5 Litres

Recovery Time of Well

Observation No.	Time	Depth
1		
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Observation No.	Time	Depth
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27		
28		

* Duplicate @ 9:20am *

MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill — WEATHER: overcast, 5°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: MW2-17 — GPS INFO:

DATE & TIME: Oct. 11, 2023 9:10am

Total depth of well from top of casing: 5.147 m (a)

Depth to water from top of casing: 2.300 m (b)

Height of casing above ground 0.752 m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

$V = 3 \times 0.025^2 \times \pi \times$ (total well depth (a) - distance to water (b))

$V = (5.89049 \times 10^{-3}) \times (____ - ____)$

$V = ____ m^3 \times 1000 =$ 17 Litres

Purged 17 Litres

Meter Readings

ph	6.57
DO	55.4 %
EC	0.168 mS
Temp.	10.1°C

Recovery Time of Well

Observation No.	Time	Depth
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill — WEATHER: Overcast, 5°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: MW1-20 — GPS INFO:

DATE & TIME: Oct. 11, 2023 10:40am

Total depth of well from top of casing:	8.325	m	(a)
Depth to water from top of casing:	1.759	m	(b)
Height of casing above ground	0.881	m	

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = 39 Litres

Purged 39 Litres

Meter Readings

ph	6.49
DO	28.1%
EC	2.581 mS
Temp.	9.0°C

Recovery Time of Well

Observation No.	Time	Depth
1		
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill — WEATHER: overcast, some rain, 7°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: SW1 — GPS INFO:

DATE & TIME: Oct. 11, 2023 2:40pm

Total depth of well from top of casing: — m (a)

Depth to water from top of casing: — m (b)

Height of casing above ground — m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____ m^3 x 1000 = — Litres

Meter Readings

ph	7.79
DO	99.6%
EC	1.032 mS
Temp.	12.4°C

Purged — Litres

Recovery Time of Well

Observation No.	Time	Depth
1		
2		
3		
4		
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill **WEATHER:** sun + cloud, 7°C

KEC Project: 2331.01 **RECORDERS:** JS / KS

DESCRIPTION: SW 2 **GPS INFO:**

DATE & TIME: Oct. 11, 2023 3:30pm

Total depth of well from top of casing: — m (a)

Depth to water from top of casing: — m (b)

Height of casing above ground — m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = —_____Litres

—

Purged _____Litres

Meter Readings

ph	7.92
DO	102.9 %
EC	0.540 mS
Temp.	12.7°C

Recovery Time of Well

Observation No.	Time	Depth
1		
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Observation No.	Time	Depth
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MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill — WEATHER: Overcast, 7°C

KEC Project: 2331.01 — RECORDERS: JS/KS

DESCRIPTION: SW4 — GPS INFO:

DATE & TIME: Oct. 11, 2023 3:07pm

Total depth of well from top of casing: — m (a)

Depth to water from top of casing: — m (b)

Height of casing above ground — m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = —Litres

Purged —Litres

Meter Readings

ph	8.07
DO	105.7%
EC	0.498mS
Temp.	14.5°C

Recovery Time of Well

Observation No.	Time	Depth
1		
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14		

Observation No.	Time	Depth
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27		
28		

MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill **WEATHER:** partly sunny, 9°C

KEC Project: 2331.01 **RECORDERS:** JS/KS

DESCRIPTION: SW6 **GPS INFO:**

DATE & TIME: Oct. 11, 2023 12:05pm

Total depth of well from top of casing: — m (a)

Depth to water from top of casing: — m (b)

Height of casing above ground — m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = —Litres

Purged —Litres

Meter Readings

ph	8.10
DO	99.6 %
EC	0.157 mS
Temp.	11.3°C

Recovery Time of Well

Observation No.	Time	Depth
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10		
11		
12		
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14		

Observation No.	Time	Depth
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27		
28		

MONITORING WELL RECORD SHEET

KRESIN Engineering Corporation

PROJECT : Blind River Landfill **WEATHER:** Sun + cloud, 7°C

KEC Project: 2331.01 **RECORDERS:** JS/KS

DESCRIPTION: SW7 **GPS INFO:**

DATE & TIME: Oct. 11, 2023 4:00pm

Total depth of well from top of casing: — m (a)

Depth to water from top of casing: — m (b)

Height of casing above ground — m

Calculate Purge Volume

Note: calc is 3 volumes for 2" well

V= 3 x 0.025^2 x π x (total well depth (a) - distance to water (b))

V= (5.89049×10^{-3}) x (_____ - _____)

V= _____m^3 x 1000 = —Litres

Purged —Litres

Meter Readings

ph	7.83
DO	104.9%
EC	1.237ms
Temp.	14.2°C

Recovery Time of Well

Observation No.	Time	Depth
1		
2		
3		
4		
5		
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10		
11		
12		
13		
14		

Observation No.	Time	Depth
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* SW1 - DRY
* SW3 - DRY
* SW5 - DRY
* Field Blank - 4:15pm

Appendix F
Laboratory Analytical Results

CERTIFICATE OF ANALYSIS

Work Order	: **TY2305646**	Page	: 1 of 15
Client	: **Kresin Engineering Corporation**	Laboratory	: Thunder Bay - Environmental
Contact	: Jennifer Sharpe	Account Manager	: Cassidy Young
Address	: 536 Fourth Line East Sault Ste Marie ON Canada P6A 5K8	Address	: 1081 Barton Street Thunder Bay ON Canada P7B 5N3
Telephone	: ----	Telephone	: +1 807 623 6463
Project	: Blind River Landfill	Date Samples Received	: 15-Jun-2023 10:20
PO	: ----	Date Analysis Commenced	: 19-Jun-2023
C-O-C number	: ----	Issue Date	: 28-Jun-2023 17:06
Sampler	: ----		
Site	: ----		
Quote number	: Blind River Landfill		
No. of samples received	: 18		
No. of samples analysed	: 17		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Cassandra Grzelewski	Team Leader - Inorganics	Inorganics, Thunder Bay, Ontario
Daron Mooney	Laboratory Assistant	Inorganics, Thunder Bay, Ontario
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Metals, Waterloo, Ontario
Julie Ruoho	Teamleader Wet Chem	Inorganics, Thunder Bay, Ontario
Mingjian Yang	Laboratory Assistant	Inorganics, Thunder Bay, Ontario
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario
Shannon Veltri	Supervisor - Water Chemistry	Inorganics, Thunder Bay, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

Sample Travel Blank: CN Container not received at laboratory, but requested on Chain of Custody / analytical request form; subsample cannot be obtained from other containers to meet request. The requested analysis cannont be performed.

Qualifiers

Qualifier	*Description*
BODF	*BOD analyzed from frozen (preserved) sample. Hold time for unpreserved samples was exceeded, but freezing can extend hold time to at least 1 month, according to ISO 5667-3 (2018).*
DLB	*Detection Limit Raised. Analyte detected at comparable level in Method Blank.*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*

DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
OWP	*Organic water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of sediment.*

Analytical Results

Sub-Matrix: **Groundwater** (Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW1-02	MW2-02	MW3-02	MW4-02	MW5-02
					Client sampling date / time	14-Jun-2023 13:41	14-Jun-2023 16:00	14-Jun-2023 10:53	14-Jun-2023 12:05	14-Jun-2023 14:13
						TY2305646-001	TY2305646-002	TY2305646-003	TY2305646-004	TY2305646-005
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/TY	2.0	mg/L		56.7	1580	285	148	49.6
Alkalinity, carbonate (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, hydroxide (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Conductivity	----	E100/TY	2.0	µS/cm		128	3400	600	373	120
Hardness (as CaCO3), dissolved	----	EC100/WT	0.60	mg/L		50.9	703	197	105	46.4
pH	----	E108/TY	0.10	pH units		7.33	7.27	8.09	7.54	7.76
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		153	1570	374	233	89
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		498	178	52.7	418	79.1
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		56.7	1580	285	148	49.6
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		0.0074	119	0.0770	0.568	<0.0050
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		0.74	260	42.6	38.4	1.10
Fluoride	16984-48-8	E235.F/TY	0.020	mg/L		<0.020	<0.400 DLDS	<0.020	<0.020	<0.020
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		0.282	128	1.00	1.06	0.204
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		<0.020	<0.400 DLDS	0.041	<0.020	0.105
Nitrite (as N)	14797-65-0	E235.NO2/TY	0.010	mg/L		<0.010	<0.200 DLDS	<0.010	<0.010	<0.010
Nitrogen, total organic	----	EC363/TY	0.050	mg/L		0.275	<16.2	0.923	0.492	0.204
Phosphorus, total	7723-14-0	E372-U/TY	0.0020	mg/L		0.250	1.60	0.0379	0.255	0.0256
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		9.42	<6.00 DLDS	1.09	<0.30	11.2
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		4.42	67.7 DLHC	15.6	6.40	1.85
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		1.35	38.9	6.92	4.04	1.26
Cation sum	----	EC101/TY	0.10	meq/L		1.23	38.5	6.30	3.74	1.10
Ion balance (cations/anions)	----	EC101/TY	0.010	%		91.1	99.0	91.0	92.6	87.3
Ion balance (APHA)	----	EC101/TY	0.01	%		-4.65	-0.52	-4.69	-3.86	-6.78
Dissolved Metals										

Analytical Results

Sub-Matrix: **Groundwater** (Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW1-02	MW2-02	MW3-02	MW4-02	MW5-02
					Client sampling date / time	14-Jun-2023 13:41	14-Jun-2023 16:00	14-Jun-2023 10:53	14-Jun-2023 12:05	14-Jun-2023 14:13
						TY2305646-001	TY2305646-002	TY2305646-003	TY2305646-004	TY2305646-005
						Result	Result	Result	Result	Result
Dissolved Metals										
Arsenic, dissolved	7440-38-2	E421/WT	0.00010	mg/L		0.00074	<0.00100 DLHC	0.00032	0.00012	0.00020
Barium, dissolved	7440-39-3	E421/WT	0.00010	mg/L		0.00739	0.340 DLHC	0.0152	0.0549	0.00675
Boron, dissolved	7440-42-8	E421/WT	0.010	mg/L		<0.010	1.88 DLHC	0.437	0.086	<0.010
Cadmium, dissolved	7440-43-9	E421/WT	0.0000050	mg/L		0.0000072	<0.0000500 DLHC	0.0000067	<0.0000050	0.0000067
Calcium, dissolved	7440-70-2	E421/WT	0.050	mg/L		13.3	166 DLHC	53.8	26.9	11.9
Chromium, dissolved	7440-47-3	E421/WT	0.00050	mg/L		0.00076	<0.00500 DLHC	0.00082	<0.00050	0.00448
Copper, dissolved	7440-50-8	E421/WT	0.00020	mg/L		0.00149	<0.00200 DLHC	0.00483	0.00032	0.00518
Iron, dissolved	7439-89-6	E421/WT	0.010	mg/L		0.098	52.9 DLHC	0.164	4.92	<0.010
Lead, dissolved	7439-92-1	E421/WT	0.000050	mg/L		0.000064	<0.000500 DLHC	<0.000050	<0.000050	0.000144
Magnesium, dissolved	7439-95-4	E421/WT	0.0050	mg/L		4.29	70.0 DLHC	15.2	9.28	4.04
Manganese, dissolved	7439-96-5	E421/WT	0.00010	mg/L		0.0339	0.358 DLHC	0.122	0.292	0.00065
Mercury, dissolved	7439-97-6	E509/WT	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000156
Potassium, dissolved	7440-09-7	E421/WT	0.050	mg/L		0.839	164 DLHC	26.7	7.17	1.02
Sodium, dissolved	7440-23-5	E421/WT	0.050	mg/L		4.27	227 DLHC	38.3	28.1	3.41
Zinc, dissolved	7440-66-6	E421/WT	0.0010	mg/L		0.0017	<0.0100 DLHC	0.0046	0.0017	0.0043
Dissolved mercury filtration location	----	EP509/WT	-	-		Field	Laboratory	Field	Field	Field
Dissolved metals filtration location	----	EP421/WT	-	-		Field	Field	Field	Field	Field
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		<2.0 BODF	<3.0 BODF, DLM	<2.0 BODF	<2.0 BODF	<2.0 BODF
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		42	276	51	46	<10
Phenols, total (4AAP)	----	E562/WT	0.0010	mg/L		<0.0010	0.0033	<0.0010	<0.0010	<0.0010
Volatile Organic Compounds										
Benzene	71-43-2	E611D/WT	0.50	µg/L		<0.50 OWP	2.38 OWP	<0.50	<0.50 OWP	<0.50
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	0.50	µg/L		<0.50 OWP	0.99 OWP	<0.50	<0.50 OWP	<0.50
Dichloromethane	75-09-2	E611D/WT	1.0	µg/L		<1.8 DLB, OWP	<1.9 DLB, OWP	<1.8 DLB	<1.9 DLB, OWP	<1.9 DLB
Toluene	108-88-3	E611D/WT	0.50	µg/L		<0.50 OWP	<0.50 OWP	<0.50	<0.50 OWP	<0.50
Vinyl chloride	75-01-4	E611D/WT	0.50	µg/L		<0.50 OWP	<0.50 OWP	<0.50	<0.50 OWP	<0.50
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611D/WT	1.0	%		99.3	100	99.0	98.9	99.9
Difluorobenzene, 1,4-	540-36-3	E611D/WT	1.0	%		98.0	96.9	97.2	97.1	97.1

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Groundwater**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW6-02	MW1-03	MW1-15	MW2-15	MW3-15
					Client sampling date / time	14-Jun-2023 11:15	14-Jun-2023 10:33	14-Jun-2023 14:55	14-Jun-2023 16:33	14-Jun-2023 12:30
						TY2305646-006	TY2305646-007	TY2305646-008	TY2305646-009	TY2305646-010
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/TY	2.0	mg/L		270	225	834	7.6	17.0
Alkalinity, carbonate (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, hydroxide (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Conductivity	----	E100/TY	2.0	µS/cm		581	2310	1570	25.0	72.8
Hardness (as CaCO3), dissolved	----	EC100/WT	0.60	mg/L		228	225	854	7.60	12.7
pH	----	E108/TY	0.10	pH units		7.66	7.36	7.14	6.54	6.80
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		348	1290	1000	33	94
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		582	424	1620	506	736
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		270	225	834	7.6	17.0
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		1.63	1.28	0.678	<0.0500 DLM	<0.0500 DLM
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		60.1	647	82.6	<0.50	6.80
Fluoride	16984-48-8	E235.F/TY	0.020	mg/L		<0.020	<0.400 DLDS	<0.200 DLDS	<0.020	<0.020
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		2.24	1.84	1.65	0.379	0.377
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		0.056	<0.400 DLDS	<0.200 DLDS	<0.020	0.028
Nitrite (as N)	14797-65-0	E235.NO2/TY	0.010	mg/L		<0.010	<0.200 DLDS	<0.100 DLDS	<0.010	<0.010
Nitrogen, total organic	----	EC363/TY	0.050	mg/L		0.610	0.560	0.972	0.379	0.377
Phosphorus, total	7723-14-0	E372-U/TY	0.0020	mg/L		0.232	0.334	0.486	0.219	0.250
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		<0.30	<6.00 DLDS	<3.00 DLDS	3.18	6.82
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		11.6	17.4 DLHC	17.6 DLHC	2.78	3.85
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		7.10	22.7	19.0	0.22	0.68
Cation sum	----	EC101/TY	0.10	meq/L		6.91	22.0	20.7	0.24	0.76
Ion balance (cations/anions)	----	EC101/TY	0.010	%		97.3	96.9	109	109	112
Ion balance (APHA)	----	EC101/TY	0.01	%		-1.36	-1.56	4.28	4.35	5.56
Dissolved Metals										
Arsenic, dissolved	7440-38-2	E421/WT	0.00010	mg/L		0.00073	<0.00100 DLHC	0.0137 DLHC	<0.00010	0.00016

Analytical Results

Sub-Matrix: **Groundwater** (Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW6-02	MW1-03	MW1-15	MW2-15	MW3-15
					Client sampling date / time	14-Jun-2023 11:15	14-Jun-2023 10:33	14-Jun-2023 14:55	14-Jun-2023 16:33	14-Jun-2023 12:30
						TY2305646-006	TY2305646-007	TY2305646-008	TY2305646-009	TY2305646-010
						Result	Result	Result	Result	Result
Dissolved Metals										
Barium, dissolved	7440-39-3	E421/WT	0.00010	mg/L		0.226	0.375 DLHC	0.175 DLHC	0.0160	0.00595
Boron, dissolved	7440-42-8	E421/WT	0.010	mg/L		0.118	0.248 DLHC	1.55 DLHC	<0.010	0.199
Cadmium, dissolved	7440-43-9	E421/WT	0.0000050	mg/L		<0.0000050	<0.0000500 DLHC	<0.0000500 DLHC	<0.0000050	0.0000074
Calcium, dissolved	7440-70-2	E421/WT	0.050	mg/L		62.1	56.1 DLHC	205 DLHC	2.46	3.14
Chromium, dissolved	7440-47-3	E421/WT	0.00050	mg/L		0.00056	<0.00500 DLHC	<0.00500 DLHC	<0.00050	0.00052
Copper, dissolved	7440-50-8	E421/WT	0.00020	mg/L		0.00169	<0.00200 DLHC	<0.00200 DLHC	0.00258	0.00502
Iron, dissolved	7439-89-6	E421/WT	0.010	mg/L		19.9	15.2 DLHC	12.5 DLHC	0.018	2.50
Lead, dissolved	7439-92-1	E421/WT	0.000050	mg/L		0.000050	<0.000500 DLHC	<0.000500 DLHC	<0.000050	0.000161
Magnesium, dissolved	7439-95-4	E421/WT	0.0050	mg/L		17.7	20.6 DLHC	83.1 DLHC	0.354	1.19
Manganese, dissolved	7439-96-5	E421/WT	0.00010	mg/L		1.22	0.485 DLHC	4.68 DLHC	0.00184	0.830
Mercury, dissolved	7439-97-6	E509/WT	0.0000050	mg/L		<0.0000050	<0.0000050	0.0000062	<0.0000050	0.0000053
Potassium, dissolved	7440-09-7	E421/WT	0.050	mg/L		6.30	40.2 DLHC	4.24 DLHC	0.258	0.341
Sodium, dissolved	7440-23-5	E421/WT	0.050	mg/L		30.3	363 DLHC	65.2 DLHC	1.67	8.44
Zinc, dissolved	7440-66-6	E421/WT	0.0010	mg/L		0.0035	<0.0100 DLHC	<0.0100 DLHC	0.0038	0.0036
Dissolved mercury filtration location	----	EP509/WT	-	-		Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/WT	-	-		Field	Field	Field	Field	Field
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		<3.0 BODF, DLM	<3.0 BODF, DLM	<3.0 BODF, DLM	<2.0 BODF	<3.0 BODF, DLM
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		69	76	98	46	10
Phenols, total (4AAP)	----	E562/WT	0.0010	mg/L		<0.0010	<0.0010	<0.0010	0.0020	0.0024
Volatile Organic Compounds										
Benzene	71-43-2	E611D/WT	0.50	µg/L		<0.50 OWP	<0.50 OWP	0.65 OWP	<0.50 OWP	<0.50 OWP
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	0.50	µg/L		<0.50 OWP	<0.50 OWP	<0.50 OWP	<0.50 OWP	<0.50 OWP
Dichloromethane	75-09-2	E611D/WT	1.0	µg/L		<1.9 DLB, OWP	<1.9 DLB, OWP	<2.0 DLB, OWP	<1.9 DLB, OWP	<1.9 DLB, OWP
Toluene	108-88-3	E611D/WT	0.50	µg/L		<0.50 OWP	<0.50 OWP	<0.50 OWP	<0.50 OWP	<0.50 OWP
Vinyl chloride	75-01-4	E611D/WT	0.50	µg/L		<0.50 OWP	<0.50 OWP	<0.50 OWP	<0.50 OWP	<0.50 OWP
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611D/WT	1.0	%		99.9	99.4	99.7	98.9	99.2
Difluorobenzene, 1,4-	540-36-3	E611D/WT	1.0	%		97.4	97.0	97.9	97.2	96.6

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Groundwater** (Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW4-15	MW1-17	MW2-17	MW1-20	Duplicate
					Client sampling date / time	14-Jun-2023 14:34	14-Jun-2023 10:04	14-Jun-2023 09:36	14-Jun-2023 11:35	14-Jun-2023 09:45
						TY2305646-011	TY2305646-012	TY2305646-013	TY2305646-014	TY2305646-015
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/TY	2.0	mg/L		46.1	70.5	65.5	70.3	66.3
Alkalinity, carbonate (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, hydroxide (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Conductivity	----	E100/TY	2.0	µS/cm		96.0	225	214	2840	221
Hardness (as CaCO3), dissolved	----	EC100/WT	0.60	mg/L		42.9	65.0	76.0	571	75.0
pH	----	E108/TY	0.10	pH units		7.18	7.21	7.54	7.27	7.63
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		73	266	158	1910	195
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		253	1740	1670	39900	1310
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		46.1	70.5	65.5	70.3	66.3
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		0.132	0.476	<0.0500 DLM	2.00	<0.0500 DLM
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		0.93	17.4	22.1	899	24.4
Fluoride	16984-48-8	E235.F/TY	0.020	mg/L		<0.020	0.050	<0.020	<0.400 DLDS	<0.020
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		0.371	1.21	1.60	2.76	1.54
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		0.100	0.235	0.063	<0.400 DLDS	0.060
Nitrite (as N)	14797-65-0	E235.NO2/TY	0.010	mg/L		<0.010	<0.010	<0.010	<0.200 DLDS	<0.010
Nitrogen, total organic	----	EC363/TY	0.050	mg/L		0.239	0.734	1.60	0.760	1.54
Phosphorus, total	7723-14-0	E372-U/TY	0.0020	mg/L		0.246	0.450	0.622	8.13	0.638
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		4.24	18.1	11.2	<6.00 DLDS	11.0
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		2.90	15.4	2.72	9.74	1.99
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		1.04	2.30	2.17	26.8	2.25
Cation sum	----	EC101/TY	0.10	meq/L		1.18	2.46	2.11	26.9	2.11
Ion balance (cations/anions)	----	EC101/TY	0.010	%		113	107	97.2	100	93.8
Ion balance (APHA)	----	EC101/TY	0.01	%		6.31	3.36	-1.40	0.19	-3.21
Total Metals										
Arsenic, total	7440-38-2	E420/WT	0.00010	mg/L		----	----	----	0.0194 DLHC	0.0117 DLHC

Analytical Results

Sub-Matrix: **Groundwater**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW4-15	MW1-17	MW2-17	MW1-20	Duplicate
					Client sampling date / time	14-Jun-2023 14:34	14-Jun-2023 10:04	14-Jun-2023 09:36	14-Jun-2023 11:35	14-Jun-2023 09:45
						TY2305646-011	TY2305646-012	TY2305646-013	TY2305646-014	TY2305646-015
						Result	Result	Result	Result	Result
Total Metals										
Barium, total	7440-39-3	E420/WT	0.00010	mg/L		----	----	----	0.958 DLHC	0.205 DLHC
Boron, total	7440-42-8	E420/WT	0.010	mg/L		----	----	----	<0.100 DLHC	<0.100 DLHC
Cadmium, total	7440-43-9	E420/WT	0.0000050	mg/L		----	----	----	0.000565 DLHC	0.000148 DLHC
Calcium, total	7440-70-2	E420/WT	0.050	mg/L		----	----	----	273 DLHC	26.2 DLHC
Chromium, total	7440-47-3	E420/WT	0.00050	mg/L		----	----	----	0.0714 DLHC	0.0619 DLHC
Copper, total	7440-50-8	E420/WT	0.00050	mg/L		----	----	----	0.100 DLHC	0.0855 DLHC
Iron, total	7439-89-6	E420/WT	0.010	mg/L		----	----	----	83.0 DLHC	27.8 DLHC
Lead, total	7439-92-1	E420/WT	0.000050	mg/L		----	----	----	0.0688 DLHC	0.0152 DLHC
Magnesium, total	7439-95-4	E420/WT	0.0050	mg/L		----	----	----	101 DLHC	13.4 DLHC
Manganese, total	7439-96-5	E420/WT	0.00010	mg/L		----	----	----	8.38 DLHC	0.321 DLHC
Mercury, total	7439-97-6	E508/WT	0.0000050	mg/L		----	----	----	<0.0000050	0.0000182
Potassium, total	7440-09-7	E420/WT	0.050	mg/L		----	----	----	7.41 DLHC	4.44 DLHC
Sodium, total	7440-23-5	E420/WT	0.050	mg/L		----	----	----	319 DLHC	15.1 DLHC
Zinc, total	7440-66-6	E420/WT	0.0030	mg/L		----	----	----	0.146 DLHC	0.0648 DLHC
Dissolved Metals										
Arsenic, dissolved	7440-38-2	E421/WT	0.00010	mg/L		0.00192	0.00087	0.00043	0.00213 DLHC	0.00043
Barium, dissolved	7440-39-3	E421/WT	0.00010	mg/L		0.00760	0.0257	0.0133	0.277 DLHC	0.0139
Boron, dissolved	7440-42-8	E421/WT	0.010	mg/L		0.010	0.023	<0.010	<0.100 DLHC	<0.010
Cadmium, dissolved	7440-43-9	E421/WT	0.0000050	mg/L		0.0000086	0.0000167	0.0000058	<0.0000500 DLHC	0.0000060
Calcium, dissolved	7440-70-2	E421/WT	0.050	mg/L		10.6	15.0	20.1	153 DLHC	19.6
Chromium, dissolved	7440-47-3	E421/WT	0.00050	mg/L		<0.00050	0.00151	0.00080	<0.00500 DLHC	0.00075
Copper, dissolved	7440-50-8	E421/WT	0.00020	mg/L		0.00284	0.00301	0.00052	0.00221 DLHC	0.00049
Iron, dissolved	7439-89-6	E421/WT	0.010	mg/L		1.86	6.15	<0.010	26.2 DLHC	<0.010
Lead, dissolved	7439-92-1	E421/WT	0.000050	mg/L		0.000090	0.000502	<0.000050	<0.000500 DLHC	<0.000050
Magnesium, dissolved	7439-95-4	E421/WT	0.0050	mg/L		3.99	6.70	6.27	45.8 DLHC	6.34
Manganese, dissolved	7439-96-5	E421/WT	0.00010	mg/L		1.97	0.654	0.00016	6.51 DLHC	0.00019
Mercury, dissolved	7439-97-6	E509/WT	0.0000050	mg/L		<0.0000050	0.0000071	<0.0000050	<0.0000050	<0.0000050
Potassium, dissolved	7440-09-7	E421/WT	0.050	mg/L		0.628	1.25	0.848	1.82 DLHC	0.858
Sodium, dissolved	7440-23-5	E421/WT	0.050	mg/L		3.51	19.3	13.1	326 DLHC	13.6
Zinc, dissolved	7440-66-6	E421/WT	0.0010	mg/L		0.0049	0.0101	<0.0010	<0.0100 DLHC	<0.0010

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)					Client sample ID	MW4-15	MW1-17	MW2-17	MW1-20	Duplicate
					Client sampling date / time	14-Jun-2023 14:34	14-Jun-2023 10:04	14-Jun-2023 09:36	14-Jun-2023 11:35	14-Jun-2023 09:45
Analyte	CAS Number	Method/Lab	LOR	Unit		TY2305646-011	TY2305646-012	TY2305646-013	TY2305646-014	TY2305646-015
						Result	Result	Result	Result	Result
Dissolved Metals										
Dissolved mercury filtration location	----	EP509/WT	-	-		Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/WT	-	-		Field	Field	Field	Field	Field
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		<3.0 BODF, DLM	<3.0 BODF, DLM	<3.0 BODF, DLM	<5.0 BODF, DLM	<3.0 BODF, DLM
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		14	130	<10	47	<10
Phenols, total (4AAP)	----	E562/WT	0.0010	mg/L		0.0015	0.0016	<0.0010	0.0015	<0.0010
Volatile Organic Compounds										
Benzene	71-43-2	E611D/WT	0.50	µg/L		<0.50	<0.50 OWP	<0.50 OWP	<0.50 OWP	<0.50 OWP
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	0.50	µg/L		<0.50	<0.50 OWP	<0.50 OWP	<0.50 OWP	<0.50 OWP
Dichloromethane	75-09-2	E611D/WT	1.0	µg/L		<2.0 DLB	<2.0 DLB, OWP	<2.0 DLB, OWP	<2.0 DLB, OWP	<2.0 DLB, OWP
Toluene	108-88-3	E611D/WT	0.50	µg/L		<0.50	<0.50 OWP	<0.50 OWP	<0.50 OWP	<0.50 OWP
Vinyl chloride	75-01-4	E611D/WT	0.50	µg/L		<0.50	<0.50 OWP	<0.50 OWP	<0.50 OWP	<0.50 OWP
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611D/WT	1.0	%		98.9	99.4	99.2	99.6	99.7
Difluorobenzene, 1,4-	540-36-3	E611D/WT	1.0	%		97.3	96.8	96.8	97.1	97.1

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Groundwater** (Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Field Blank	Travel Blank	----	----	----
					Client sampling date / time	14-Jun-2023 17:42	14-Jun-2023 12:01	----	----	----
						TY2305646-016	TY2305646-017	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	----	----	----
Conductivity	----	E100/TY	2.0	µS/cm		<2.0	<2.0	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/WT	0.60	mg/L		<0.60	<0.60	----	----	----
pH	----	E108/TY	0.10	pH units		5.61	5.17	----	----	----
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		<10	<10	----	----	----
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		<3.0	<3.0	----	----	----
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		<0.0050	<0.0050	----	----	----
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		<0.50	<0.50	----	----	----
Fluoride	16984-48-8	E235.F/TY	0.020	mg/L		<0.020	<0.020	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		0.068	<0.050	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		<0.020	<0.020	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2/TY	0.010	mg/L		<0.010	<0.010	----	----	----
Nitrogen, total organic	----	EC363/TY	0.050	mg/L		0.068	<0.051	----	----	----
Phosphorus, total	7723-14-0	E372-U/TY	0.0020	mg/L		<0.0020	<0.0020	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		<0.30	<0.30	----	----	----
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	0.0050	mg/L		<0.0050	----	----	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		<0.50	<0.50	----	----	----
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		<0.10	<0.10	----	----	----
Cation sum	----	EC101/TY	0.10	meq/L		<0.10	<0.10	----	----	----
Ion balance (cations/anions)	----	EC101/TY	0.010	%		100	100	----	----	----
Ion balance (APHA)	----	EC101/TY	0.01	%		<0.01	<0.01	----	----	----
Total Metals										
Arsenic, total	7440-38-2	E420/WT	0.00010	mg/L		<0.00010	----	----	----	----

Analytical Results

Sub-Matrix: **Groundwater**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Field Blank	Travel Blank	----	----	----
					Client sampling date / time	14-Jun-2023 17:42	14-Jun-2023 12:01	----	----	----
						TY2305646-016	TY2305646-017	--------	--------	--------
						Result	Result	----	----	----
Total Metals										
Barium, total	7440-39-3	E420/WT	0.00010	mg/L		<0.00010	----	----	----	----
Boron, total	7440-42-8	E420/WT	0.010	mg/L		0.014	----	----	----	----
Cadmium, total	7440-43-9	E420/WT	0.0000050	mg/L		<0.0000050	----	----	----	----
Calcium, total	7440-70-2	E420/WT	0.050	mg/L		<0.050	----	----	----	----
Chromium, total	7440-47-3	E420/WT	0.00050	mg/L		<0.00050	----	----	----	----
Copper, total	7440-50-8	E420/WT	0.00050	mg/L		<0.00050	----	----	----	----
Iron, total	7439-89-6	E420/WT	0.010	mg/L		<0.010	----	----	----	----
Lead, total	7439-92-1	E420/WT	0.000050	mg/L		<0.000050	----	----	----	----
Magnesium, total	7439-95-4	E420/WT	0.0050	mg/L		<0.0050	----	----	----	----
Manganese, total	7439-96-5	E420/WT	0.00010	mg/L		<0.00010	----	----	----	----
Mercury, total	7439-97-6	E508/WT	0.0000050	mg/L		<0.0000050	----	----	----	----
Potassium, total	7440-09-7	E420/WT	0.050	mg/L		<0.050	----	----	----	----
Sodium, total	7440-23-5	E420/WT	0.050	mg/L		<0.050	----	----	----	----
Zinc, total	7440-66-6	E420/WT	0.0030	mg/L		<0.0030	----	----	----	----
Dissolved Metals										
Arsenic, dissolved	7440-38-2	E421/WT	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Barium, dissolved	7440-39-3	E421/WT	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Boron, dissolved	7440-42-8	E421/WT	0.010	mg/L		0.013	<0.010	----	----	----
Cadmium, dissolved	7440-43-9	E421/WT	0.0000050	mg/L		<0.0000050	<0.0000050	----	----	----
Calcium, dissolved	7440-70-2	E421/WT	0.050	mg/L		<0.050	<0.050	----	----	----
Chromium, dissolved	7440-47-3	E421/WT	0.00050	mg/L		<0.00050	<0.00050	----	----	----
Copper, dissolved	7440-50-8	E421/WT	0.00020	mg/L		<0.00020	<0.00020	----	----	----
Iron, dissolved	7439-89-6	E421/WT	0.010	mg/L		<0.010	<0.010	----	----	----
Lead, dissolved	7439-92-1	E421/WT	0.000050	mg/L		<0.000050	<0.000050	----	----	----
Magnesium, dissolved	7439-95-4	E421/WT	0.0050	mg/L		<0.0050	<0.0050	----	----	----
Manganese, dissolved	7439-96-5	E421/WT	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Mercury, dissolved	7439-97-6	E509/WT	0.0000050	mg/L		<0.0000050	<0.0000050	----	----	----
Potassium, dissolved	7440-09-7	E421/WT	0.050	mg/L		<0.050	<0.050	----	----	----
Sodium, dissolved	7440-23-5	E421/WT	0.050	mg/L		<0.050	<0.050	----	----	----
Zinc, dissolved	7440-66-6	E421/WT	0.0010	mg/L		<0.0010	<0.0010	----	----	----

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)					Client sample ID	Field Blank	Travel Blank	----	----	----
					Client sampling date / time	14-Jun-2023 17:42	14-Jun-2023 12:01	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		TY2305646-016	TY2305646-017	--------	--------	--------
						Result	Result	----	----	----
Dissolved Metals										
Dissolved mercury filtration location	----	EP509/WT	-	-		Field	Field	----	----	----
Dissolved metals filtration location	----	EP421/WT	-	-		Field	Field	----	----	----
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		<2.0 BODF	<2.0 BODF	----	----	----
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		<10	<10	----	----	----
Phenols, total (4AAP)	----	E562/WT	0.0010	mg/L		0.0019	0.0027	----	----	----
Volatile Organic Compounds										
Benzene	71-43-2	E611D/WT	0.50	µg/L		<0.50	<0.50	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	0.50	µg/L		<0.50	<0.50	----	----	----
Dichloromethane	75-09-2	E611D/WT	1.0	µg/L		<1.0	<1.0	----	----	----
Toluene	108-88-3	E611D/WT	0.50	µg/L		<0.50	<0.50	----	----	----
Vinyl chloride	75-01-4	E611D/WT	0.50	µg/L		<0.50	<0.50	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611D/WT	1.0	%		98.2	99.2	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611D/WT	1.0	%		97.1	97.1	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page 1 of 2

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Canada Toll Free: 1 800 668 9878

Environmental Division
Thunder Bay
Work Order Reference
TY2305646

Telephone : + 1 807 623 8463

Report To	Contact and company name below will appear on the final report	Reports / Recipients	Turnaround Time (TAT) Requested
Company:	Kresin Engineering Corporation	Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)	☐ Routine [R] if received by 3pm M-F - no surcharges apply
Contact:	Jennifer Sharpe	Merge QC/QCI Reports with COA ☑ YES ☐ NO ☐ N/A	☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
Phone:	705-949-4900	☑ Compare Results to Criteria on Report - provide details below if box checked	☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
Street:	536 Fourth Line East	Email 1 or Fax jennifer@kresinengineering.ca	☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
City/Province:	Sault Ste. Marie, ON	Email 2	☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.
Postal Code:	P6A 5K8	Email 3	Additional fees may apply to rush requests on weekends, statutory
Invoice To	Same as Report To ☑ YES ☐ NO	Invoice Recipients	Date and Time Required for all E&P TATs: dd-[illegible]
	Copy of Invoice with Report ☐ YES ☑ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	For all tests with rush TATs requested, please contact your AL
Company:		Email 1 or Fax annette@kresinengineering.ca	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #	TY2022KECO100001	AFE/Cost Center:	PO#
Job #:	Blind River Landfill	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (ALS use only): TY2305646 | ALS Contact: Cassidy Young | Sampler: Jenn Sharpe

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5 Column 1:	(Alk, BOD, Chloride, COD, DOC, EC,	Dissolved Hg, Dissolved As, B, Ba, Ca,	Cd, Cr, Cu, Fe, K, Mg, Mn, Na, PB, Zn,	NH3, NO2, NO3, Total Phosph, pH,	Phenols, SO4, TDS, TKN, TSS, VOC's)	CO3, HCO3, OH, Organic Nitrogen	Ion Balnce, Hardness	Total Cyanide, Fluoride	Total Hg, Total As, B, Ba, Ca,	Cd, Cr, Cu, Fe, K, Mg, Mn, Na, PB, Zn	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
1	MW1-02	14-June-23	1:41	Groundwater	10	x						x	x	x					
2	MW2-02		4:00	Groundwater	10	x						x	x	x					
3	MW3-02		10:53	Groundwater	10	x						x	x	x					
4	MW4-02		12:05	Groundwater	10	x						x	x	x					
5	MW5-02		2:13	Groundwater	10	x						x	x	x					
6	MW6-02		11:15	Groundwater	10	x						x	x	x					
7	MW1-03		10:33	Groundwater	10	x						x	x	x					
8	MW1-15		2:55	Groundwater	10	x						x	x	x					
9	MW2-15		4:33	Groundwater	10	x						x	x	x					
10	MW3-15		12:30	Groundwater	10	x						x	x	x					
11	MW4-15		2:34	Groundwater	10	x						x	x	x					
12	MW1-17		10:04	Groundwater	10	x						x	x	x					
13	MW2-17		9:36	Groundwater	10	x						x	x	x					
14	MW1-20		11:35	Groundwater	12	x						x	x	x	x	x			
15	Duplicate		9:45	Groundwater	10	x						x	x	x					
16	Field Blank	↓	5:42	Groundwater	10	x						x	x	x					

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please compare to ODWS and PWQO where appropriate. Thanks Samples filtered when required

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☑ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
16.9	15.6	15.2	15.1	16.0	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: K Shoreditch	Date: June 14, 23	Time: 8:00	Received by:	Date:	Time:	Received by: LV	Date: 6/15/23	Time: 10:20

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FES 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System please submit using an Authorized DW COC form

G-Grozier

6 Coolers

Chain-of-Custody (COC) / Analytical Request Form

COC Number: 22

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Saulte Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☑ YES ☐ NO ☐ N/A

☑ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: jennifer@kresinengineering.ca

Email 2:

Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: annette@kresinengineering.ca

Email 2:

Turnaround Time (TAT) Requested

- ☐ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	TY2022KECO100001
Job #:	Blind River Landfill
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Cassidy Young

Sampler: Jen Sharpe

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 6 Column 2 :	(Alkalinity, BOD, Chloride, COD, DOC,	EC, Dissolved B, Ba, Ca, Fe, Mg, Na	NH3, NO3, pH, SO4,TDS, TSS)	Dissolved Cr, Pb, Mn, K	CO3, HCO3, OH	Ion Balnce	VOC Spike	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
17	Travel Blank			Groundwater	13	X				X	X	X				
~~18~~	~~Travel Spike~~			~~Groundwater~~									X			
				Groundwater												
				Groundwater												
				Groundwater												
				Groundwater												
				Groundwater												
				Groundwater												
				Groundwater												
				Groundwater												
				Groundwater												
17				Groundwater												
				Groundwater												

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please compare to ODWS.
Duplicate sample set has extra bottles???

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C	
16.9	15.6	16.4	15.2	15.1	16.0

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: K Shenkarie	Date: June 14 '23	Time: 16:00	Received by:	Date:	Time:	Received by: LV	Date: 6/15/23	Time: 10:20

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System please submit using an Authorized DW COC form

G. Arnaiti

63 Coolers

CERTIFICATE OF ANALYSIS

Work Order	: **TY2307746**	Page	: 1 of 4
Client	: **Kresin Engineering Corporation**	Laboratory	: ALS Environmental - Thunder Bay
Contact	: Jennifer Sharpe	Account Manager	: Cassidy Young
Address	: 536 Fourth Line East Sault Ste Marie ON Canada P6A 5K8	Address	: 1081 Barton Street Thunder Bay ON Canada P7B 5N3
Telephone	: ----	Telephone	: +1 807 623 6463
Project	: Blind River Landfill	Date Samples Received	: 09-Aug-2023 09:30
PO	: ----	Date Analysis Commenced	: 09-Aug-2023
C-O-C number	: ----	Issue Date	: 17-Aug-2023 11:24
Sampler	: Jennifer Sharpe		
Site	: Kresin Engineering - Blind River Landfill		
Quote number	: Blind River Landfill		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Cassandra Grzelewski	Team Leader - Inorganics	Inorganics, Thunder Bay, Ontario
Cassandra Grzelewski	Team Leader - Inorganics	Metals, Thunder Bay, Ontario
Daron Mooney	Laboratory Assistant	Inorganics, Thunder Bay, Ontario
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Metals, Waterloo, Ontario
Julie Ruoho	Teamleader Wet Chem	Inorganics, Thunder Bay, Ontario
Julie Ruoho	Teamleader Wet Chem	Metals, Thunder Bay, Ontario
Nik Perkio	Inorganics Analyst	Inorganics, Waterloo, Ontario
Rhiannon Scheffee	Laboratory Assistant	Metals, Thunder Bay, Ontario
Shannon Veltri	Supervisor - Water Chemistry	Inorganics, Thunder Bay, Ontario
Shannon Veltri	Supervisor - Water Chemistry	Metals, Thunder Bay, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW2	SW4	SW6	SW7	----
					Client sampling date / time	08-Aug-2023 13:00	08-Aug-2023 12:05	08-Aug-2023 11:14	08-Aug-2023 13:31	----
						TY2307746-001	TY2307746-002	TY2307746-003	TY2307746-004	--------
						Result	Result	Result	Result	----
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/TY	2.0	mg/L		212	249	49.8	136	----
Alkalinity, carbonate (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	----
Alkalinity, hydroxide (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	----
Conductivity	----	E100/TY	2.0	µS/cm		496	612	107	2010	----
Hardness (as CaCO3), dissolved	----	EC100/TY	0.60	mg/L		148	189	49.1	248	----
pH	----	E108/TY	0.10	pH units		8.23	7.91	7.50	6.97	----
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		329	429	101	1220	----
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		5.7	76.1	148	7300	----
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		212	249	49.8	136	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		0.0074	5.14	0.0259	0.126	----
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		33.2	50.6	1.53	566	----
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		1.11	8.45	3.27	9.04	----
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		0.021	<0.020	<0.020	<0.200 DLDS	----
Nitrite (as N)	14797-65-0	E235.NO2/TY	0.010	mg/L		<0.010	<0.010	<0.010	<0.100 DLDS	----
Phosphorus, total	7723-14-0	E372-U/TY	0.0020	mg/L		0.0151	0.161	0.271	0.846	----
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		<0.30	<0.30	2.10	<3.00 DLDS	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		22.6	51.2	27.5	37.2	----
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		5.17	6.40	1.08	18.7	----
Cation sum	----	EC101/TY	0.10	meq/L		4.91	6.45	1.20	16.6	----
Ion balance (cations/anions)	----	EC101/TY	0.010	%		95.0	101	111	88.8	----
Ion balance (APHA)	----	EC101/TY	0.01	%		-2.58	0.39	5.26	-5.95	----
Total Metals										
Arsenic, total	7440-38-2	E420/TY	0.00010	mg/L		0.00104	0.00156	0.00241	0.00584	----
Barium, total	7440-39-3	E420/TY	0.00010	mg/L		0.0265	0.158	0.0284	0.264	----
Boron, total	7440-42-8	E420/TY	0.010	mg/L		0.427	0.405	0.029	<0.100 DLM	----
Cadmium, total	7440-43-9	E420/TY	0.0000050	mg/L		0.0000083	0.0000237	0.0000558	0.000434	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW2	SW4	SW6	SW7	----
					Client sampling date / time	08-Aug-2023 13:00	08-Aug-2023 12:05	08-Aug-2023 11:14	08-Aug-2023 13:31	----
Analyte	CAS Number	Method/Lab	LOR	Unit		TY2307746-001	TY2307746-002	TY2307746-003	TY2307746-004	--------
						Result	Result	Result	Result	----
Total Metals										
Chromium, total	7440-47-3	E420/TY	0.00050	mg/L		0.00087	0.00132	0.00259	0.0275	----
Copper, total	7440-50-8	E420/TY	0.00050	mg/L		<0.00050	0.00175	0.00168	0.0347	----
Iron, total	7439-89-6	E420/TY	0.010	mg/L		0.380	18.8	2.63	40.4	----
Lead, total	7439-92-1	E420/TY	0.000050	mg/L		<0.000050	0.000808	0.00138	0.0125	----
Mercury, total	7439-97-6	E508/WT	0.0000050	mg/L		<0.0000050	<0.0000050	0.0000068	0.0000296	----
Zinc, total	7440-66-6	E420/TY	0.0030	mg/L		<0.0030	0.0104	0.0094	0.140	----
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421/TY	0.050	mg/L		37.2	50.0	10.8	66.5	----
Magnesium, dissolved	7439-95-4	E421/TY	0.0050	mg/L		13.3	15.6	5.38	19.8	----
Manganese, dissolved	7439-96-5	E421/TY	0.00010	mg/L		0.0341	0.191	0.134	0.767	----
Mercury, dissolved	7439-97-6	E509/WT	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
Zinc, dissolved	7440-66-6	E421/TY	0.0010	mg/L		<0.0010	0.0011	0.0012	0.0011	----
Dissolved mercury filtration location	----	EP509/WT	-	-		Field	Field	Field	Field	----
Dissolved metals filtration location	----	EP421/TY	-	-		Field	Field	Field	Field	----
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		2.5	8.9	6.6	80.6	----
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		64	178	109	401	----
Phenols, total (4AAP)	----	E562/WT	0.0010	mg/L		<0.0010	0.0028	0.0038	0.0031	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **TY2307746**	Page	: 1 of 19
Client	: **Kresin Engineering Corporation**	Laboratory	: ALS Environmental - Thunder Bay
Contact	: Jennifer Sharpe	Account Manager	: Cassidy Young
Address	: 536 Fourth Line East Sault Ste Marie ON Canada P6A 5K8	Address	: 1081 Barton Street Thunder Bay, Ontario Canada P7B 5N3
Telephone	: ----	Telephone	: +1 807 623 6463
Project	: Blind River Landfill	Date Samples Received	: 09-Aug-2023 09:30
PO	: ----	Issue Date	: 17-Aug-2023 11:24
C-O-C number	: ----		
Sampler	: Jennifer Sharpe		
Site	: Kresin Engineering - Blind River Landfill		
Quote number	: Blind River Landfill		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d] SW2	E550	08-Aug-2023	----	----	----		11-Aug-2023	4 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d] SW4	E550	08-Aug-2023	----	----	----		11-Aug-2023	4 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d] SW6	E550	08-Aug-2023	----	----	----		11-Aug-2023	4 days	3 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d] SW7	E550	08-Aug-2023	----	----	----		11-Aug-2023	4 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) [ON MECP] SW2	E559-L	08-Aug-2023	----	----	----		11-Aug-2023	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) [ON MECP] SW4	E559-L	08-Aug-2023	----	----	----		11-Aug-2023	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) [ON MECP] SW6	E559-L	08-Aug-2023	----	----	----		11-Aug-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) [ON MECP]										
SW7	E559-L	08-Aug-2023	----	----	----		11-Aug-2023	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP]										
SW2	E562	08-Aug-2023	12-Aug-2023	28 days	4 days	✓	14-Aug-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP]										
SW4	E562	08-Aug-2023	12-Aug-2023	28 days	4 days	✓	14-Aug-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP]										
SW6	E562	08-Aug-2023	12-Aug-2023	28 days	4 days	✓	14-Aug-2023	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP]										
SW7	E562	08-Aug-2023	12-Aug-2023	28 days	4 days	✓	14-Aug-2023	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP]										
SW2	E298	08-Aug-2023	09-Aug-2023	28 days	1 days	✓	16-Aug-2023	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP]										
SW4	E298	08-Aug-2023	09-Aug-2023	28 days	1 days	✓	16-Aug-2023	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP]										
SW6	E298	08-Aug-2023	09-Aug-2023	28 days	1 days	✓	16-Aug-2023	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP]										
SW7	E298	08-Aug-2023	09-Aug-2023	28 days	1 days	✓	16-Aug-2023	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] SW2	E235.Cl	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] SW4	E235.Cl	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] SW6	E235.Cl	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP] SW7	E235.Cl	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] SW2	E235.NO3	08-Aug-2023	10-Aug-2023	7 days	2 days	✓	10-Aug-2023	7 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] SW4	E235.NO3	08-Aug-2023	10-Aug-2023	7 days	2 days	✓	10-Aug-2023	7 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] SW6	E235.NO3	08-Aug-2023	10-Aug-2023	7 days	2 days	✓	10-Aug-2023	7 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP] SW7	E235.NO3	08-Aug-2023	10-Aug-2023	7 days	2 days	✓	10-Aug-2023	7 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP] SW2	E235.NO2	08-Aug-2023	10-Aug-2023	7 days	2 days	✓	10-Aug-2023	7 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP]										
SW4	E235.NO2	08-Aug-2023	10-Aug-2023	7 days	2 days	✓	10-Aug-2023	7 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP]										
SW6	E235.NO2	08-Aug-2023	10-Aug-2023	7 days	2 days	✓	10-Aug-2023	7 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP]										
SW7	E235.NO2	08-Aug-2023	10-Aug-2023	7 days	2 days	✓	10-Aug-2023	7 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
SW2	E235.SO4	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
SW4	E235.SO4	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
SW6	E235.SO4	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
SW7	E235.SO4	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP]										
SW2	E318	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	11-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP]										
SW4	E318	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	11-Aug-2023	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP]										
SW6	E318	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	11-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP]										
SW7	E318	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	11-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP]										
SW2	E372-U	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP]										
SW4	E372-U	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP]										
SW6	E372-U	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP]										
SW7	E372-U	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	10-Aug-2023	28 days	2 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
SW2	E509	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
SW4	E509	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
SW6	E509	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) SW7	E509	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SW2	E421	08-Aug-2023	10-Aug-2023	180 days	2 days	✓	10-Aug-2023	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SW4	E421	08-Aug-2023	10-Aug-2023	180 days	2 days	✓	10-Aug-2023	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SW6	E421	08-Aug-2023	10-Aug-2023	180 days	2 days	✓	10-Aug-2023	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SW7	E421	08-Aug-2023	10-Aug-2023	180 days	2 days	✓	10-Aug-2023	180 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) [ON MECP] SW2	E358-L	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) [ON MECP] SW4	E358-L	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) [ON MECP] SW6	E358-L	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) [ON MECP] SW7	E358-L	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] SW2	E290	08-Aug-2023	10-Aug-2023	14 days	2 days	✓	11-Aug-2023	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] SW4	E290	08-Aug-2023	10-Aug-2023	14 days	2 days	✓	11-Aug-2023	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] SW6	E290	08-Aug-2023	10-Aug-2023	14 days	2 days	✓	11-Aug-2023	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP] SW7	E290	08-Aug-2023	10-Aug-2023	14 days	2 days	✓	11-Aug-2023	14 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] SW2	E100	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	11-Aug-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] SW4	E100	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	11-Aug-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] SW6	E100	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	11-Aug-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP] SW7	E100	08-Aug-2023	10-Aug-2023	28 days	2 days	✓	11-Aug-2023	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] SW2	E108	08-Aug-2023	10-Aug-2023	14 days	2 days	✓	11-Aug-2023	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE [ON MECP]										
SW4	E108	08-Aug-2023	10-Aug-2023	14 days	2 days	✓	11-Aug-2023	14 days	3 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP]										
SW6	E108	08-Aug-2023	10-Aug-2023	14 days	2 days	✓	11-Aug-2023	14 days	3 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP]										
SW7	E108	08-Aug-2023	10-Aug-2023	14 days	2 days	✓	11-Aug-2023	14 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP]										
SW2	E162	08-Aug-2023	----	----	----		11-Aug-2023	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP]										
SW4	E162	08-Aug-2023	----	----	----		11-Aug-2023	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP]										
SW6	E162	08-Aug-2023	----	----	----		11-Aug-2023	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP]										
SW7	E162	08-Aug-2023	----	----	----		11-Aug-2023	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP]										
SW2	E160	08-Aug-2023	----	----	----		11-Aug-2023	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP]										
SW4	E160	08-Aug-2023	----	----	----		11-Aug-2023	7 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP] SW6	E160	08-Aug-2023	----	----	----		11-Aug-2023	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP] SW7	E160	08-Aug-2023	----	----	----		11-Aug-2023	7 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP] SW2	E508	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP] SW4	E508	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP] SW6	E508	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP] SW7	E508	08-Aug-2023	11-Aug-2023	28 days	3 days	✓	14-Aug-2023	28 days	6 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW2	E420	08-Aug-2023	11-Aug-2023	180 days	3 days	✓	11-Aug-2023	180 days	3 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW4	E420	08-Aug-2023	11-Aug-2023	180 days	3 days	✓	11-Aug-2023	180 days	3 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW6	E420	08-Aug-2023	11-Aug-2023	180 days	3 days	✓	11-Aug-2023	180 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
SW7	E420	08-Aug-2023	11-Aug-2023	180 days	3 days	✓	11-Aug-2023	180 days	3 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1078558	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	1077237	1	5	20.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1080342	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	1077238	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	1078551	1	13	7.6	5.0	✓
Conductivity in Water	E100	1078557	1	15	6.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1081095	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1078316	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1081598	1	17	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	1078549	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	1078552	1	19	5.2	5.0	✓
pH by Meter	E108	1078556	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1081120	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1078550	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	1080284	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1077234	1	5	20.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1081082	1	11	9.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	1080313	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1077232	1	6	16.6	5.0	✓
TSS by Gravimetry	E160	1080285	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1078558	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	1077237	1	5	20.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1080342	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	1077238	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	1078551	1	13	7.6	5.0	✓
Conductivity in Water	E100	1078557	1	15	6.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1081095	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1078316	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1081598	1	17	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	1078549	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	1078552	1	19	5.2	5.0	✓
pH by Meter	E108	1078556	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1081120	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1078550	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	1080284	1	19	5.2	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1077234	1	5	20.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1081082	1	11	9.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	1080313	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1077232	1	6	16.6	5.0	✓
TSS by Gravimetry	E160	1080285	1	19	5.2	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1078558	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	1077237	1	5	20.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	1080342	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	1077238	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	1078551	1	13	7.6	5.0	✓
Conductivity in Water	E100	1078557	1	15	6.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1081095	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1078316	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1081598	1	17	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	1078549	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	1078552	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1081120	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1078550	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	1080284	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1077234	1	5	20.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1081082	1	11	9.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	1080313	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1077232	1	6	16.6	5.0	✓
TSS by Gravimetry	E160	1080285	1	19	5.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1077237	1	5	20.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	1077238	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	1078551	1	13	7.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1081095	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1078316	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1081598	1	17	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	1078549	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	1078552	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1081120	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1078550	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1077234	1	5	20.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1081082	1	11	9.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	1080313	1	11	9.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1077232	1	6	16.6	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Thunder Bay	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Thunder Bay	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Thunder Bay	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 ALS Environmental - Thunder Bay	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl ALS Environmental - Thunder Bay	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Thunder Bay	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Thunder Bay	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Thunder Bay	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Thunder Bay	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 ALS Environmental - Thunder Bay	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Thunder Bay	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Thunder Bay	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total metals in Water by CRC ICPMS	E420 ALS Environmental - Thunder Bay	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Thunder Bay	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 ALS Environmental - Waterloo	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 ALS Environmental - Waterloo	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Thunder Bay	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L ALS Environmental - Thunder Bay	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 ALS Environmental - Waterloo	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Thunder Bay	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Thunder Bay	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Thunder Bay	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 ALS Environmental - Thunder Bay	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Thunder Bay	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 ALS Environmental - Thunder Bay	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 ALS Environmental - Waterloo	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Page 1 of 1

Environmental Division Thunder Bay
Work Order Reference
TY2307746

Telephone : +1 807 623 6463

Report To	Contact and company name below will appear on the final report	Reports / Recipients	Turnaround Time (TAT) Requ
Company:	Kresin Engineering Corporation	Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)	☐ Routine [R] if received by 3pm M-F - no surcharg
Contact:	Jennifer Sharpe	Merge QC/QCI Reports with COA ☑ YES ☐ NO ☐ N/A	☐ 4 day [P4] if received by 3pm M-F - 20% rush s
Phone:	705-949-4900	☑ Compare Results to Criteria on Report - provide details below if box checked	☐ 3 day [P3] if received by 3pm M-F - 25% rush s
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	☐ 2 day [P2] if received by 3pm M-F - 50% rush
Street:	536 Fourth Line East	Email 1 or Fax jennifer@kresinengineering.ca	☐ 1 day [E] if received by 3pm M-F - 100% rush
City/Province:	Sault Ste. Marie, ON	Email 2	☐ Same day [E2] if received by 10am M-S - 200%
Postal Code:	P6A 5K8	Email 3	Additional fees may apply to rush req
Invoice To	Same as Report To ☑ YES ☐ NO	Invoice Recipients	Date and Time Required for all E&P TATs:
	Copy of Invoice with Report ☐ YES ☑ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	For all tests with rush TATs requested, please contact your AM to confirm availa
Company:		Email 1 or Fax annette@kresinengineering.ca	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	TY2022KECO100001	AFE/Cost Center:	PO#:
Job #:	Blind River Landfill	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):	TY2307746	ALS Contact: Cassidy Young	Sampler: Jenn Sharpe

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5, Coloumn 3	(Alkalinity, [HCO3, CO3], Cl, Total Mercury	Conductivity, Total Metals (M+MS see below)	NH3,NO2, NO3, Total Phosphorus, pH	Phenols 4AAP, SO4, TDS, TKN, TSS)	CO3, HCO3, OH	Ion Balance, Dissolved Mercury	Dissolved Mn, and Zi, Hardness	DOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	SW1	08-Aug-23		Surface Water	9	X					X	X	X	X			
	SW2	08-Aug-23	1:00pm	Surface Water		X					X	X	X	X			
	SW3			Surface Water		X					X	X	X	X			
	SW4	08-Aug-23	12:05pm	Surface Water		X					X	X	X	X			
	SW5			Surface Water		X					X	X	X	X			
	SW6	08-Aug-23	11:14	Surface Water		X					X	X	X	X			
	SW7	08-Aug-23	1:31pm	Surface Water		X					X	X	X	X			

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Please compare to PWQO
Are samples for human consumption/ use? ☐ YES ☑ NO	Total Metal Reportables (As, Ba, B, Cd, Cu, Cr, Fe, Mn, Pb, Zi) Samples field

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☒ ICE PACKS ☐ FROZEN ☒ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
18.4	18.6				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Jenn Sharpe	Date: Aug. 8, 2023	Time: 5pm	Received by:	Date:	Time:	Received by:	Date: 9-Aug-23	Time: 9:30

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

[1] If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

2 coolers ON Northland

CERTIFICATE OF ANALYSIS

Work Order	: **TY2309039**	Page	: 1 of 4
Client	: **Kresin Engineering Corporation**	Laboratory	: ALS Environmental - Thunder Bay
Contact	: Jennifer Sharpe	Account Manager	: Cassidy Young
Address	: 536 Fourth Line East Sault Ste Marie ON Canada P6A 5K8	Address	: 1081 Barton Street Thunder Bay ON Canada P7B 5N3
Telephone	: ----	Telephone	: +1 807 623 6463
Project	: Blind River Landfill	Date Samples Received	: 12-Sep-2023 10:25
PO	: ----	Date Analysis Commenced	: 12-Sep-2023
C-O-C number	: ----	Issue Date	: 26-Sep-2023 11:41
Sampler	: ----		
Site	: Kresin Engineering - Blind River Landfill		
Quote number	: Blind River Landfill		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Cassandra Grzelewski	Team Leader - Inorganics	Inorganics, Thunder Bay, Ontario
Cassandra Grzelewski	Team Leader - Inorganics	Metals, Thunder Bay, Ontario
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Metals, Waterloo, Ontario
Julie Ruoho	Teamleader Wet Chem	Inorganics, Thunder Bay, Ontario
Julie Ruoho	Teamleader Wet Chem	Metals, Thunder Bay, Ontario
Nik Perkio	Inorganics Analyst	Metals, Waterloo, Ontario
Rhiannon Scheffee	Laboratory Assistant	Metals, Thunder Bay, Ontario
Shannon Veltri	Supervisor - Water Chemistry	Metals, Thunder Bay, Ontario
Taelur Kachur	Laboratory Analyst	Inorganics, Thunder Bay, Ontario

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW1	SW2	SW4	SW7	----
					Client sampling date / time	11-Sep-2023 11:38	11-Sep-2023 13:34	11-Sep-2023 11:14	11-Sep-2023 12:45	----
						TY2309039-001	TY2309039-002	TY2309039-003	TY2309039-004	--------
						Result	Result	Result	Result	----
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/TY	2.0	mg/L		414	243	164	84.7	----
Alkalinity, carbonate (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	----
Alkalinity, hydroxide (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	----
Conductivity	----	E100/TY	2.0	µS/cm		1090	548	438	1430	----
Hardness (as CaCO3), dissolved	----	EC100/TY	0.60	mg/L		327	196	137	233	----
pH	----	E108/TY	0.10	pH units		8.25	8.15	7.56	6.87	----
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		659	358	286	919	----
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		14.2	9.4	1180	6180	----
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		414	243	164	84.7	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		2.70	0.0096	4.40	0.0338	----
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		102	34.8	36.3	394	----
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		4.04	0.782	7.09	5.68	----
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		0.112	<0.020	<0.020	<0.400 DLDS	----
Nitrite (as N)	14797-65-0	E235.NO2/TY	0.010	mg/L		0.191	<0.010	<0.010	<0.200 DLDS	----
Phosphorus, total	7723-14-0	E372-U/TY	0.0020	mg/L		0.0294	0.0159	0.223	1.19	----
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		22.9	<0.30	12.0	23.8	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		28.5 DLHC	19.7	39.2	19.7	----
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		11.6	5.84	4.55	13.3	----
Cation sum	----	EC101/TY	0.10	meq/L		12.4	6.30	4.90	14.1	----
Ion balance (cations/anions)	----	EC101/TY	0.010	%		107	108	108	106	----
Ion balance (APHA)	----	EC101/TY	0.01	%		3.33	3.79	3.70	2.92	----
Total Metals										
Arsenic, total	7440-38-2	E420/TY	0.00010	mg/L		0.00053	0.00083	0.00180	0.00469	----
Barium, total	7440-39-3	E420/TY	0.00010	mg/L		0.0849	0.0424	0.124	0.236	----
Boron, total	7440-42-8	E420/TY	0.010	mg/L		1.14	0.515	0.523	0.087	----
Cadmium, total	7440-43-9	E420/TY	0.0000050	mg/L		0.0000054	<0.0000050	0.0000973	0.000373	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW1	SW2	SW4	SW7	----
					Client sampling date / time	11-Sep-2023 11:38	11-Sep-2023 13:34	11-Sep-2023 11:14	11-Sep-2023 12:45	----
Analyte	CAS Number	Method/Lab	LOR	Unit		TY2309039-001	TY2309039-002	TY2309039-003	TY2309039-004	--------
						Result	Result	Result	Result	----
Total Metals										
Chromium, total	7440-47-3	E420/TY	0.00050	mg/L		0.00058	0.00066	0.00369	0.0172	----
Copper, total	7440-50-8	E420/TY	0.00050	mg/L		<0.00050	<0.00050	0.00760	0.0224	----
Iron, total	7439-89-6	E420/TY	0.010	mg/L		0.439	0.644	28.9	69.1	----
Lead, total	7439-92-1	E420/TY	0.000050	mg/L		<0.000050	<0.000050	0.00368	0.00749	----
Mercury, total	7439-97-6	E508/WT	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	0.0000740 DLM	----
Zinc, total	7440-66-6	E420/TY	0.0030	mg/L		<0.0030	<0.0030	0.0381	0.210	----
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421/TY	0.050	mg/L		73.9	53.3	37.4	63.3	----
Magnesium, dissolved	7439-95-4	E421/TY	0.0050	mg/L		34.6	15.4	10.6	18.3	----
Manganese, dissolved	7439-96-5	E421/TY	0.00010	mg/L		0.0882	0.0586	0.0736	1.32	----
Mercury, dissolved	7439-97-6	E509/WT	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
Zinc, dissolved	7440-66-6	E421/TY	0.0010	mg/L		0.0019	0.0020	<0.0020 DLM	0.0029	----
Dissolved mercury filtration location	----	EP509/WT	-	-		Field	Field	Field	Field	----
Dissolved metals filtration location	----	EP421/TY	-	-		Field	Field	Field	Field	----
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		2.5	2.0	27.0	70.9	----
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		73	51	170	287	----
Phenols, total (4AAP)	----	E562/WT	0.0010	mg/L		<0.0010	0.0044	0.0032	0.0028	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page | of |

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Environmental Division
Thunder Bay
Work Order Reference
TY2309039

Telephone : +1 807 623 6463

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Saulte Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☑ YES ☐ NO ☐ N/A
☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: jennifer@kresinengineering.ca
Email 2:
Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: annette@kresinengineering.ca
Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minim
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minim
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minim
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minim
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.
Additional fees may apply to rush requests on weekend
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, please con... to confirm availability.

Project Information

ALS Account # / Quote #: KECO100/TY2022KECO100001
Job #: Blind River Landfill
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#:
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only): TY2309039
ALS Contact: Cassidy Young Sampler: Jenn Sharpe

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5, Coloumn 3	(Alkalinity, BOD, Cl, COD, Total Mercury	Conductivity, Total Metals (With Reps)	NH3,NO2, NO3, Total Phosphorus, pH,	Phenols 4AAP, SO4, TDS, TKN, TSS)	CO3, HCO3, OH	Ion Balnce, Dissolved Mercury	Dissolved Mn, and Zi, Hardness	DOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
1	SW1	11-Sept-23	11:38	Surface Water	9	X					X	X	X	X			
2	SW2		1:34	Surface Water	9	X					X	X	X	X			
	SW3			Surface Water	9	X					X	X	X	X			
3	SW4		11:14	Surface Water	9	X					X	X	X	X			
	SW5			Surface Water	9	X					X	X	X	X			
	SW6			Surface Water	9	X					X	X	X	X			
4	SW7		12:45	Surface Water	9	X					X	X	X	X			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please compare to PWQO; Filtered when required -
Total Metal Reportables (As, Ba, B, Co, Cu, Cr, Fe, Mn, Pb, Zi)

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
8.3							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by: LV	Date: 9/12/23	Time: 10:25
	Sept. 11 2023	4:00	1					

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Courier → No Info. 1 Cooler

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **TY2310467**	Page	: 1 of 12
Amendment	: **1**		
Client	: **Kresin Engineering Corporation**	Laboratory	: ALS Environmental - Thunder Bay
Contact	: Jennifer Sharpe	Account Manager	: Cassidy Young
Address	: 536 Fourth Line East Sault Ste Marie ON Canada P6A 5K8	Address	: 1081 Barton Street Thunder Bay ON Canada P7B 5N3
Telephone	: ----	Telephone	: +1 807 623 6463
Project	: Blind River Landfill	Date Samples Received	: 12-Oct-2023 09:30
PO	: ----	Date Analysis Commenced	: 13-Oct-2023
C-O-C number	: ----	Issue Date	: 21-Feb-2024 14:59
Sampler	: ----		
Site	: ----		
Quote number	: Blind River Landfill - 2024		
No. of samples received	: 16		
No. of samples analysed	: 16		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Ashlyn Smith	Production Supervisor	Inorganics, Thunder Bay, Ontario
Cassandra Grzelewski	Team Leader - Inorganics	Inorganics, Thunder Bay, Ontario
Cassandra Grzelewski	Team Leader - Inorganics	Inorganics, Thunder Bay, Ontario
Cassandra Grzelewski	Team Leader - Inorganics	Inorganics, Thunder Bay, Ontario
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Rhovee Guevarra		Metals, Winnipeg, Manitoba
Rhovee Guevarra		Metals, Winnipeg, Manitoba
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Rhovee Guevarra		Metals, Winnipeg, Manitoba
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario
Shannon Veltri	Supervisor - Water Chemistry	Inorganics, Thunder Bay, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
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Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Metals, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Metals, Waterloo, Ontario

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µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

Amendment (21/02/2024): This report has been amended and re-released to allow the reporting of additional analytical data: -002 ion balance added

Received MW-03-02 routine bottle empty. Will be poured off from BOD bottle for analysis.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*

Analytical Results

Sub-Matrix: **Groundwater**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW1-02	MW2-02	MW3-02	MW4-02	MW5-02
					Client sampling date / time	11-Oct-2023 11:52	11-Oct-2023 14:08	11-Oct-2023 10:05	11-Oct-2023 10:56	11-Oct-2023 12:19
						TY2310467-001	TY2310467-002	TY2310467-003	TY2310467-004	TY2310467-005
						Result	Result	Result	Result	Result
Physical Tests										
Conductivity	----	E100/TY	2.0	µS/cm		153	3670	582	475	124
Hardness (as CaCO3), dissolved	----	EC100/WP	0.60	mg/L		62.5	----	196	114	46.5
pH	----	E108/TY	0.10	pH units		7.28	7.28	8.36	7.37	7.55
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		133	1760	370	312	96
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		249	188	63.8	238	64.8
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		68.1	1680	257	97.0	50.8
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		0.0059	132	0.0235	0.637	0.0133
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		0.79	255	36.2	85.5	1.02
Fluoride	16984-48-8	E235.F/TY	0.020	mg/L		<0.020	----	<0.020	<0.020	<0.020
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		0.205	144	0.711	0.910	0.096
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		0.092	<1.00 DLDS	<0.020	<0.020	0.109
Nitrite (as N)	14797-65-0	E235.NO2/TY	0.010	mg/L		----	<0.500 DLDS	----	----	----
Nitrogen, total organic	----	EC363/TY	0.050	mg/L		0.199	<18.1	0.688	0.273	0.083
Phosphorus, total	7723-14-0	E372-U/TY	0.0020	mg/L		----	0.248	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		9.63	<15.0 DLDS	5.62	1.47	10.4
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	0.0050	mg/L		<0.0050	----	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		2.63	74.5 DLHC	18.4	6.47	1.40
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		1.59	40.8	6.27	4.38	1.27
Cation sum	----	EC101/TY	0.10	meq/L		1.50	44.8	6.41	4.17	1.10
Ion balance (cations/anions)	----	EC101/TY	0.010	%		94.3	110	102	95.2	86.6
Ion balance (APHA)	----	EC101/TY	0.01	%		-2.91	4.67	1.10	-2.46	-7.17
Dissolved Metals										
Arsenic, dissolved	7440-38-2	E421/WP	0.00010	mg/L		----	0.00127	----	----	----
Barium, dissolved	7440-39-3	E421/WP	0.00010	mg/L		0.00966	0.456	0.0144	0.0637	0.00736
Boron, dissolved	7440-42-8	E421/WP	0.010	mg/L		0.018	2.18	0.540	0.091	<0.010

Analytical Results

Sub-Matrix: **Groundwater**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW1-02	MW2-02	MW3-02	MW4-02	MW5-02
					Client sampling date / time	11-Oct-2023 11:52	11-Oct-2023 14:08	11-Oct-2023 10:05	11-Oct-2023 10:56	11-Oct-2023 12:19
						TY2310467-001	TY2310467-002	TY2310467-003	TY2310467-004	TY2310467-005
						Result	Result	Result	Result	Result
Dissolved Metals										
Cadmium, dissolved	7440-43-9	E421/WP	0.0000050	mg/L		----	<0.0000050	----	----	----
Calcium, dissolved	7440-70-2	E421/WP	0.050	mg/L		17.1	185	54.6	30.5	12.3
Chromium, dissolved	7440-47-3	E421/WP	0.00050	mg/L		----	0.00433	----	----	----
Copper, dissolved	7440-50-8	E421/WP	0.00020	mg/L		----	<0.00020	----	----	----
Iron, dissolved	7439-89-6	E421/WP	0.010	mg/L		0.066	62.2	0.157	4.70	<0.010
Lead, dissolved	7439-92-1	E421/WP	0.000050	mg/L		----	<0.000050	----	----	----
Magnesium, dissolved	7439-95-4	E421/WP	0.0050	mg/L		4.81	84.3	14.4	9.27	3.83
Manganese, dissolved	7439-96-5	E421/WP	0.00010	mg/L		0.0107	0.361	0.102	0.303	0.00093
Mercury, dissolved	7439-97-6	E509/WT	0.0000050	mg/L		----	<0.0000500 DLM	----	----	----
Potassium, dissolved	7440-09-7	E421/WP	0.050	mg/L		----	178	----	----	----
Sodium, dissolved	7440-23-5	E421/WP	0.050	mg/L		5.09	285	40.9	32.4	3.23
Zinc, dissolved	7440-66-6	E421/WP	0.0010	mg/L		----	0.0016	----	----	----
Dissolved mercury filtration location	----	EP509/WT	-	-		----	Field	----	----	----
Dissolved metals filtration location	----	EP421/WP	-	-		Field	Field	Field	Field	Field
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		<3.0 DLM	13.4	<2.0	<2.0	<2.0
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		<10	252	43	34	<10
Phenols, total (4AAP)	----	E562/WT	0.0010	mg/L		----	0.0038	----	----	----
Volatile Organic Compounds										
Benzene	71-43-2	E611D/WT	0.50	µg/L		----	2.34	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	0.50	µg/L		----	0.99	----	----	----
Dichloromethane	75-09-2	E611D/WT	1.0	µg/L		----	<1.0	----	----	----
Toluene	108-88-3	E611D/WT	0.50	µg/L		----	<0.50	----	----	----
Vinyl chloride	75-01-4	E611D/WT	0.50	µg/L		----	<0.50	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611D/WT	1.0	%		----	95.3	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611D/WT	1.0	%		----	96.2	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Groundwater** (Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW6-02	MW1-03	MW1-15	MW3-15	MW4-15
					Client sampling date / time	11-Oct-2023 10:20	11-Oct-2023 09:49	11-Oct-2023 13:10	11-Oct-2023 08:55	11-Oct-2023 12:48
						TY2310467-006	TY2310467-007	TY2310467-008	TY2310467-009	TY2310467-010
						Result	Result	Result	Result	Result
Physical Tests										
Conductivity	----	E100/TY	2.0	µS/cm		571	2130	1620	61.4	139
Hardness (as CaCO3), dissolved	----	EC100/WP	0.60	mg/L		200	187	832	10.9	54.7
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WP	0.60	mg/L		----	194	----	----	----
pH	----	E108/TY	0.10	pH units		7.81	7.34	7.12	6.61	6.62
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		330	1140	1010	75	98
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		297	214	2000	1430	824
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		223	214	850	13.7	66.0
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		1.36	0.937	0.842	0.0069	0.684
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		56.3	543	76.8	5.08	1.97
Fluoride	16984-48-8	E235.F/TY	0.020	mg/L		<0.020	<0.400 DLDS	<0.400 DLDS	<0.020	<0.020
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		1.79	1.62	2.20	0.518	1.50
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		0.232	<0.400 DLDS	<0.400 DLDS	0.048	0.044
Nitrogen, total organic	----	EC363/TY	0.050	mg/L		0.430	0.683	1.36	0.511	0.816
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		<0.30	<6.00 DLDS	<6.00 DLDS	5.70	4.02
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		11.1	19.7	18.2	3.32	3.82
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		6.06	19.6	19.2	0.54	1.46
Cation sum	----	EC101/TY	0.10	meq/L		6.04	19.3	20.3	0.51	1.72
Ion balance (cations/anions)	----	EC101/TY	0.010	%		99.7	98.5	106	94.4	118
Ion balance (APHA)	----	EC101/TY	0.01	%		-0.16	-0.77	2.78	-2.86	8.18
Total Metals										
Arsenic, total	7440-38-2	E420/WP	0.00010	mg/L		----	0.00097	----	----	----
Barium, total	7440-39-3	E420/WP	0.00010	mg/L		----	0.332	----	----	----
Boron, total	7440-42-8	E420/WP	0.010	mg/L		----	0.305	----	----	----
Cadmium, total	7440-43-9	E420/WP	0.0000050	mg/L		----	0.0000778	----	----	----
Chromium, total	7440-47-3	E420/WP	0.00050	mg/L		----	0.00722	----	----	----

Analytical Results

Sub-Matrix: **Groundwater**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW6-02	MW1-03	MW1-15	MW3-15	MW4-15
					Client sampling date / time	11-Oct-2023 10:20	11-Oct-2023 09:49	11-Oct-2023 13:10	11-Oct-2023 08:55	11-Oct-2023 12:48
						TY2310467-006	TY2310467-007	TY2310467-008	TY2310467-009	TY2310467-010
						Result	Result	Result	Result	Result
Total Metals										
Copper, total	7440-50-8	E420/WP	0.00050	mg/L		----	0.00398	----	----	----
Iron, total	7439-89-6	E420/WP	0.010	mg/L		----	13.5	----	----	----
Lead, total	7439-92-1	E420/WP	0.000050	mg/L		----	0.00126	----	----	----
Magnesium, total	7439-95-4	E420/WP	0.0050	mg/L		----	14.9	----	----	----
Mercury, total	7439-97-6	E508/WT	0.0000050	mg/L		----	<0.0000050	----	----	----
Zinc, total	7440-66-6	E420/WP	0.0030	mg/L		----	0.0073	----	----	----
Calcium, total	7440-70-2	E420/WP	0.050	mg/L		----	53.3	----	----	----
Dissolved Metals										
Barium, dissolved	7440-39-3	E421/WP	0.00010	mg/L		0.182	0.321	0.212	0.00510	0.0125
Boron, dissolved	7440-42-8	E421/WP	0.010	mg/L		0.144	0.280	1.41	0.123	0.028
Calcium, dissolved	7440-70-2	E421/WP	0.050	mg/L		54.5	48.9	198	2.88	12.8
Iron, dissolved	7439-89-6	E421/WP	0.010	mg/L		14.9	10.8	12.3	0.398	9.83
Magnesium, dissolved	7439-95-4	E421/WP	0.0050	mg/L		15.4	15.8	81.9	0.910	5.52
Manganese, dissolved	7439-96-5	E421/WP	0.00010	mg/L		0.781	0.403	4.24	0.236	1.55
Sodium, dissolved	7440-23-5	E421/WP	0.050	mg/L		29.2	326	63.9	5.85	3.62
Dissolved metals filtration location	----	EP421/WP	-	-		Field	Field	Field	Field	Field
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		<3.0 DLM	2.3	4.6	<3.0 DLM	<5.0 DLM
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		36	76	53	50	56

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Groundwater**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW1-17	MW2-17	MW1-20	DUPLICATE	TRIP BLANK
					Client sampling date / time	11-Oct-2023 09:30	11-Oct-2023 09:10	11-Oct-2023 10:40	11-Oct-2023 09:20	11-Oct-2023 12:00
						TY2310467-011	TY2310467-012	TY2310467-013	TY2310467-014	TY2310467-015
						Result	Result	Result	Result	Result
Physical Tests										
Conductivity	----	E100/TY	2.0	µS/cm		262	168	3060	168	<2.0
Hardness (as CaCO3), dissolved	----	EC100/WP	0.60	mg/L		99.6	70.2	627	70.2	<0.60
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WP	0.60	mg/L		----	----	1980	----	----
pH	----	E108/TY	0.10	pH units		7.16	7.57	7.31	7.50	5.27
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		192	146	2260	155	<10
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		468	682	71500	537	<3.0
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		93.4	71.5	83.2	72.0	<2.0
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		0.768	0.0107	2.30	0.0106	<0.0050
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		25.8	2.56	910	2.59	<0.50
Fluoride	16984-48-8	E235.F/TY	0.020	mg/L		0.028	<0.020	<1.00 DLDS	<0.020	<0.020
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		1.66	0.824	4.36	0.796	<0.050
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		0.068	0.072	<1.00 DLDS	0.071	<0.020
Nitrogen, total organic	----	EC363/TY	0.050	mg/L		0.892	0.813	2.06	0.785	<0.051
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		1.31	11.2	<15.0 DLDS	11.2	<0.30
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		21.7	2.77	10.5	1.37	<0.50
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		2.63	1.74	27.3	1.75	<0.10
Cation sum	----	EC101/TY	0.10	meq/L		3.08	1.60	28.2	1.60	<0.10
Ion balance (cations/anions)	----	EC101/TY	0.010	%		117	92.0	103	91.4	100
Ion balance (APHA)	----	EC101/TY	0.01	%		7.88	-4.19	1.62	-4.48	<0.01
Total Metals										
Arsenic, total	7440-38-2	E420/WP	0.00010	mg/L		----	----	0.0431	----	----
Barium, total	7440-39-3	E420/WP	0.00010	mg/L		----	----	1.97	----	----
Boron, total	7440-42-8	E420/WP	0.010	mg/L		----	----	0.056	----	----
Cadmium, total	7440-43-9	E420/WP	0.0000050	mg/L		----	----	0.00140	----	----
Chromium, total	7440-47-3	E420/WP	0.00050	mg/L		----	----	0.286	----	----

Analytical Results

Sub-Matrix: **Groundwater**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW1-17	MW2-17	MW1-20	DUPLICATE	TRIP BLANK
					Client sampling date / time	11-Oct-2023 09:30	11-Oct-2023 09:10	11-Oct-2023 10:40	11-Oct-2023 09:20	11-Oct-2023 12:00
						TY2310467-011	TY2310467-012	TY2310467-013	TY2310467-014	TY2310467-015
						Result	Result	Result	Result	Result
Total Metals										
Copper, total	7440-50-8	E420/WP	0.00050	mg/L		----	----	0.422	----	----
Iron, total	7439-89-6	E420/WP	0.010	mg/L		----	----	222	----	----
Lead, total	7439-92-1	E420/WP	0.000050	mg/L		----	----	0.149	----	----
Magnesium, total	7439-95-4	E420/WP	0.0050	mg/L		----	----	187	----	----
Mercury, total	7439-97-6	E508/WT	0.0000050	mg/L		----	----	0.000131 DLM	----	----
Zinc, total	7440-66-6	E420/WP	0.0030	mg/L		----	----	0.380	----	----
Calcium, total	7440-70-2	E420/WP	0.050	mg/L		----	----	484	----	----
Dissolved Metals										
Barium, dissolved	7440-39-3	E421/WP	0.00010	mg/L		0.0396	0.0115	0.403	0.0115	<0.00010
Boron, dissolved	7440-42-8	E421/WP	0.010	mg/L		0.039	0.013	0.015	<0.010	<0.010
Calcium, dissolved	7440-70-2	E421/WP	0.050	mg/L		23.8	18.7	172	18.6	<0.050
Iron, dissolved	7439-89-6	E421/WP	0.010	mg/L		14.4	<0.010	24.1	<0.010	<0.010
Magnesium, dissolved	7439-95-4	E421/WP	0.0050	mg/L		9.76	5.72	48.0	5.78	<0.0050
Manganese, dissolved	7439-96-5	E421/WP	0.00010	mg/L		0.892	0.00028	6.70	0.00026	<0.00010
Sodium, dissolved	7440-23-5	E421/WP	0.050	mg/L		10.1	4.02	330	4.04	<0.050
Dissolved metals filtration location	----	EP421/WP	-	-		Field	Field	Field	Field	Field
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		6.4	<3.0 DLM	<10.0 DLM	<3.0 DLM	<2.0
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		86	67	67	<10	<10

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Groundwater**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	FIELD BLANK	----	----	----	----
					Client sampling date / time	11-Oct-2023 16:15	----	----	----	----
					TY2310467-016	--------	--------	--------	--------	
					Result	----	----	----	----	
Physical Tests										
Conductivity	----	E100/TY	2.0	µS/cm		<2.0	----	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/WP	0.60	mg/L		<0.60	----	----	----	----
pH	----	E108/TY	0.10	pH units		5.71	----	----	----	----
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		<10	----	----	----	----
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		<3.0	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	----	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		<0.0050	----	----	----	----
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		<0.50	----	----	----	----
Fluoride	16984-48-8	E235.F/TY	0.020	mg/L		<0.020	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		<0.050	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		<0.020	----	----	----	----
Nitrogen, total organic	----	EC363/TY	0.050	mg/L		<0.051	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		<0.30	----	----	----	----
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	0.0050	mg/L		<0.0050	----	----	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		<0.50	----	----	----	----
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		<0.10	----	----	----	----
Cation sum	----	EC101/TY	0.10	meq/L		<0.10	----	----	----	----
Ion balance (cations/anions)	----	EC101/TY	0.010	%		100	----	----	----	----
Ion balance (APHA)	----	EC101/TY	0.01	%		<0.01	----	----	----	----
Dissolved Metals										
Barium, dissolved	7440-39-3	E421/WP	0.00010	mg/L		0.00016	----	----	----	----
Boron, dissolved	7440-42-8	E421/WP	0.010	mg/L		<0.010	----	----	----	----
Calcium, dissolved	7440-70-2	E421/WP	0.050	mg/L		<0.050	----	----	----	----
Iron, dissolved	7439-89-6	E421/WP	0.010	mg/L		<0.010	----	----	----	----
Magnesium, dissolved	7439-95-4	E421/WP	0.0050	mg/L		0.0077	----	----	----	----
Manganese, dissolved	7439-96-5	E421/WP	0.00010	mg/L		<0.00010	----	----	----	----

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)					Client sample ID	FIELD BLANK	----	----	----	----
					Client sampling date / time	11-Oct-2023 16:15	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		TY2310467-016	--------	--------	--------	--------
						Result	----	----	----	----
Dissolved Metals										
Sodium, dissolved	7440-23-5	E421/WP	0.050	mg/L		0.191	----	----	----	----
Dissolved metals filtration location	----	EP421/WP	-	-		Field	----	----	----	----
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		<2.0	----	----	----	----
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		<10	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

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Environmental Division Thunder Bay
Work Order Reference
TY2310467

Telephone : +1 807 623 6463

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Sault Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Kresin Engineering Corporation
Contact:	Accounting

Reports / Recipients

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☑ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: jennifer@kresinengineering.ca
Email 2:
Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: annette@kresinengineering.ca
Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minim
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minim
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minim
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minim
☐ Same day [E2] if received by 10am M-S - 200% rush surcharg
Additional fees may apply to rush requests on weeke
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, please

Project Information

ALS Account # / Quote #:	KECO100/TY2022KECO100001
Job #:	Blind River Landfill Fall
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): TY2310467
ALS Contact: Cassidy Young
Sampler: Jenn Sharpe

Analysis R

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5 Column 1:	Alkalinity, BOD, Conductivity, pH, TDS	TSS, Chloride, Nitrite/Nitrate, Sulfide, TKN	COD, DOC, Total Phosphorous, Phenols	Ammonia, Dissolved Mercury, VOC	Dissolved Metals: As, B, Ba, Ca, Cd, Cr	Cu, Fe, K, Mg, Mn, Na, Pb, Zn	Schedule 5, Column 2:	Alkalinity, pH, BOD, Chloride, COD, DOC	Conductivity, Ammonia, Nitrate, Sulfate	TSS, TDS, Dissolved Metals: B, Ba, Ca	Fe, Mg, Na	Ion Balance, Organic Nitrogen, Hardness	Total Cyanide, Fluoride	Total Metals: As, B, Ba, Ca, Cd, Cr, Cu, F	Mg, Na Total Mercury	SUSPECTED HAZARD (see notes)
1	MW1-02	11-Oct-23	11:52	Groundwater	6								R					R	R			
2	MW2-02		2:08	Groundwater	9	R																
3	MW3-02		10:05	Groundwater	6								R					R	R			
4	MW4-02		10:56	Groundwater	6								R					R	R			
5	MW5-02		12:19	Groundwater	6								R					R	R			
6	MW6-02		10:20	Groundwater	6								R					R	R			
7	MW1-03		9:49	Groundwater	8								R					R	R	R	R	
8	MW1-15		1:10	Groundwater	6								R					R	R			
	~~MW2-15~~			~~Groundwater~~									R					R	R			
9	MW3-15		8:55am	Groundwater	6								R					R	R			
10	MW4-15		12:48	Groundwater	6								R					R	R			
11	MW1-17		9:30am	Groundwater	6								R					R	R			
12	MW2-17		9:10am	Groundwater	6								R					R	R			
13	MW1-20		10:40	Groundwater	8								R					R	R	R	R	
14	Duplicate		9:20am	Groundwater	6								R					R	R			
15	Trip Blank			Groundwater	6								R					R	R			
16																						

Drinking Water (DW) Samples[1] (client use)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Field Filtered when required. Please compare to ODWS
We also did a field blank but wasn't on chain.
To be analyzed for same as MW1-02 @4:15pm

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
11.3	11.4	8.0	9.6	9.6			

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	11 Oct. 11, 2023	8pm

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	12-Oct-23	9:30

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

5 Cooler Crozier

CERTIFICATE OF ANALYSIS

Work Order	: **TY2310464**	Page	: 1 of 6
Client	: **Kresin Engineering Corporation**	Laboratory	: ALS Environmental - Thunder Bay
Contact	: Jennifer Sharpe	Account Manager	: Cassidy Young
Address	: 536 Fourth Line East Sault Ste Marie ON Canada P6A 5K8	Address	: 1081 Barton Street Thunder Bay ON Canada P7B 5N3
Telephone	: ----	Telephone	: +1 807 623 6463
Project	: Blind River Landfill	Date Samples Received	: 12-Oct-2023 09:30
PO	: ----	Date Analysis Commenced	: 12-Oct-2023
C-O-C number	: ----	Issue Date	: 30-Oct-2023 11:42
Sampler	: ----		
Site	: Kresin Engineering - Blind River Landfill		
Quote number	: Blind River Landfill		
No. of samples received	: 6		
No. of samples analysed	: 6		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Cassandra Grzelewski	Team Leader - Inorganics	Inorganics, Thunder Bay, Ontario
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Julie Ruoho	Teamleader Wet Chem	Inorganics, Thunder Bay, Ontario
Nik Perkio	Inorganics Analyst	Metals, Waterloo, Ontario
Rhovee Guevarra		Metals, Winnipeg, Manitoba
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Metals, Waterloo, Ontario

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)					Client sample ID	Travel VOC Spike	----	----	----	----
					Client sampling date / time	11-Oct-2023 12:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	TY2310464-006	--------	--------	--------	--------	
					Result	----	----	----	----	
Volatile Organic Compounds										
Acetone	67-64-1	E611D/WT	0.000002	%	126.71	----	----	----	----	
Benzene	71-43-2	E611D/WT	0.00000005	%	89.63	----	----	----	----	
Bromodichloromethane	75-27-4	E611D/WT	0.00000005	%	94.63	----	----	----	----	
Bromoform	75-25-2	E611D/WT	0.00000005	%	93.6	----	----	----	----	
Bromomethane	74-83-9	E611D/WT	0.00000005	%	73.86	----	----	----	----	
Carbon disulfide	75-15-0	E611D/WT	0.0000001	%	74.05	----	----	----	----	
Carbon tetrachloride	56-23-5	E611D/WT	0.00000002	%	88.44	----	----	----	----	
Chlorobenzene	108-90-7	E611D/WT	0.00000005	%	88.39	----	----	----	----	
Chloroethane	75-00-3	E611D/WT	0.00000005	%	79.46	----	----	----	----	
Chloroform	67-66-3	E611D/WT	0.00000005	%	95.7	----	----	----	----	
Chloromethane	74-87-3	E611D/WT	0.0000002	%	67.22	----	----	----	----	
Dibromochloromethane	124-48-1	E611D/WT	0.00000005	%	87.7	----	----	----	----	
Dibromoethane, 1,2-	106-93-4	E611D/WT	0.00000002	%	92.72	----	----	----	----	
Dichlorobenzene, 1,2-	95-50-1	E611D/WT	0.00000005	%	85.97	----	----	----	----	
Dichlorobenzene, 1,3-	541-73-1	E611D/WT	0.00000005	%	82.99	----	----	----	----	
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	0.00000005	%	82.12	----	----	----	----	
Dichlorodifluoromethane	75-71-8	E611D/WT	0.00000005	%	36.68	----	----	----	----	
Dichloroethane, 1,1-	75-34-3	E611D/WT	0.00000005	%	96.43	----	----	----	----	
Dichloroethane, 1,2-	107-06-2	E611D/WT	0.00000005	%	95.78	----	----	----	----	
Dichloroethylene, 1,1-	75-35-4	E611D/WT	0.00000005	%	86.2	----	----	----	----	
Dichloroethylene, cis+trans-1,2-	540-59-0	E611D/WT	0.000000071	%	178.5	----	----	----	----	
Dichloroethylene, cis-1,2-	156-59-2	E611D/WT	0.00000005	%	91.92	----	----	----	----	
Dichloroethylene, trans-1,2-	156-60-5	E611D/WT	0.00000005	%	86.63	----	----	----	----	
Dichloromethane	75-09-2	E611D/WT	0.0000001	%	97.38	----	----	----	----	
Dichloropropane, 1,2-	78-87-5	E611D/WT	0.00000005	%	93.65	----	----	----	----	
Dichloropropylene, cis+trans-1,3-	542-75-6	E611D/WT	0.00000005	%	NR	----	----	----	----	
Dichloropropylene, cis-1,3-	10061-01-5	E611D/WT	0.00000003	%	46.67	----	----	----	----	
Dichloropropylene, trans-1,3-	10061-02-6	E611D/WT	0.00000003	%	42.66	----	----	----	----	

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)					Client sample ID	Travel VOC Spike	----	----	----	----
					Client sampling date / time	11-Oct-2023 12:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		TY2310464-006	--------	--------	--------	--------
						Result	----	----	----	----
Volatile Organic Compounds										
Ethylbenzene	100-41-4	E611D/WT	0.00000005	%		86.2	----	----	----	----
Hexane, n-	110-54-3	E611D/WT	0.00000005	%		32.33	----	----	----	----
Hexanone, 2-	591-78-6	E611D/WT	0.000002	%		82.75	----	----	----	----
Methyl ethyl ketone [MEK]	78-93-3	E611D/WT	0.000002	%		95.28	----	----	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D/WT	0.000002	%		84.57	----	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D/WT	0.00000005	%		89.9	----	----	----	----
Styrene	100-42-5	E611D/WT	0.00000005	%		79.5	----	----	----	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D/WT	0.00000005	%		89.63	----	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D/WT	0.00000005	%		100.32	----	----	----	----
Tetrachloroethylene	127-18-4	E611D/WT	0.00000005	%		76.3	----	----	----	----
Toluene	108-88-3	E611D/WT	0.00000005	%		86.59	----	----	----	----
Trichloroethane, 1,1,1-	71-55-6	E611D/WT	0.00000005	%		91	----	----	----	----
Trichloroethane, 1,1,2-	79-00-5	E611D/WT	0.00000005	%		95.1	----	----	----	----
Trichloroethylene	79-01-6	E611D/WT	0.00000005	%		85.47	----	----	----	----
Trichlorofluoromethane	75-69-4	E611D/WT	0.00000005	%		82.87	----	----	----	----
Vinyl chloride	75-01-4	E611D/WT	0.00000005	%		66.04	----	----	----	----
Xylene, m+p-	179601-23-1	E611D/WT	0.00000004	%		89.85	----	----	----	----
Xylene, o-	95-47-6	E611D/WT	0.00000003	%		90.16	----	----	----	----
Xylenes, total	1330-20-7	E611D/WT	0.5	µg/L		NR	----	----	----	----
BTEX, total	----	E611D/WT	1	µg/L		NR	----	----	----	----
Trihalomethanes [THMs], total	----	E611D/WT	1	µg/L		NR	----	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611D/WT	1.0	%		95.5	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611D/WT	1.0	%		96.0	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW1	SW2	SW4	SW6	SW7
					Client sampling date / time	11-Oct-2023 14:40	11-Oct-2023 15:30	11-Oct-2023 15:07	11-Oct-2023 12:05	11-Oct-2023 16:00
						TY2310464-001	TY2310464-002	TY2310464-003	TY2310464-004	TY2310464-005
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/TY	2.0	mg/L		412	228	191	31.0	65.0
Alkalinity, carbonate (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	13.2	<2.0	<2.0	<2.0
Alkalinity, hydroxide (as CaCO3)	----	E290/TY	2.0	mg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Conductivity	----	E100/TY	2.0	µS/cm		1060	550	514	133	1430
Hardness (as CaCO3), dissolved	----	EC100/WP	0.60	mg/L		354	172	151	53.5	221
pH	----	E108/TY	0.10	pH units		8.28	8.47	8.21	7.55	7.84
Solids, total dissolved [TDS]	----	E162/TY	10	mg/L		612	328	293	99	834
Solids, total suspended [TSS]	----	E160/TY	3.0	mg/L		15.5	16.3	379	15.4	27.6
Alkalinity, total (as CaCO3)	----	E290/TY	2.0	mg/L		412	241	191	31.0	65.0
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/TY	0.0050	mg/L		7.13	0.298	8.47	0.0227	0.0405
Chloride	16887-00-6	E235.Cl/TY	0.50	mg/L		88.5	34.1	36.3	0.66	345
Kjeldahl nitrogen, total [TKN]	----	E318/TY	0.050	mg/L		6.82	0.836	12.7	0.984	0.660
Nitrate (as N)	14797-55-8	E235.NO3/TY	0.020	mg/L		0.378	0.021	0.153	<0.020	<0.200 DLDS
Nitrite (as N)	14797-65-0	E235.NO2/TY	0.010	mg/L		<0.100 DLDS	<0.010	0.055	<0.010	<0.100 DLDS
Phosphorus, total	7723-14-0	E372-U/TY	0.0020	mg/L		0.0197	0.0188	0.236	0.0494	0.0622
Sulfate (as SO4)	14808-79-8	E235.SO4/TY	0.30	mg/L		11.5	0.46	17.7	28.9	59.8
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/WT	0.50	mg/L		20.8	19.1	30.4	18.7	8.74
Ion Balance										
Anion sum	----	EC101/TY	0.10	meq/L		11.0	5.79	5.22	1.24	12.3
Cation sum	----	EC101/TY	0.10	meq/L		11.8	5.62	5.42	1.23	12.5
Ion balance (cations/anions)	----	EC101/TY	0.010	%		107	97.1	104	99.2	102
Ion balance (APHA)	----	EC101/TY	0.01	%		3.51	-1.49	1.88	-0.40	0.81
Total Metals										
Arsenic, total	7440-38-2	E420/WP	0.00010	mg/L		0.00037	0.00060	0.00178	0.00092	0.00046
Barium, total	7440-39-3	E420/WP	0.00010	mg/L		0.0703	0.0397	0.109	0.0113	0.0940
Boron, total	7440-42-8	E420/WP	0.010	mg/L		0.760	0.433	0.386	0.022	0.051
Cadmium, total	7440-43-9	E420/WP	0.0000050	mg/L		<0.0000050	<0.0000050	0.000125	0.0000055	0.0000129
Chromium, total	7440-47-3	E420/WP	0.00050	mg/L		0.00058	0.00068	0.00446	<0.00050	0.00119

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW1	SW2	SW4	SW6	SW7
					Client sampling date / time	11-Oct-2023 14:40	11-Oct-2023 15:30	11-Oct-2023 15:07	11-Oct-2023 12:05	11-Oct-2023 16:00
Analyte	CAS Number	Method/Lab	LOR	Unit		TY2310464-001	TY2310464-002	TY2310464-003	TY2310464-004	TY2310464-005
						Result	Result	Result	Result	Result
Total Metals										
Copper, total	7440-50-8	E420/WP	0.00050	mg/L		0.00054	<0.00050	0.0104	0.00075	0.00130
Iron, total	7439-89-6	E420/WP	0.010	mg/L		1.42	0.631	43.0	0.246	3.76
Lead, total	7439-92-1	E420/WP	0.000050	mg/L		<0.000050	0.000057	0.00500	0.000182	0.000371
Mercury, total	7439-97-6	E508/WT	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Zinc, total	7440-66-6	E420/WP	0.0030	mg/L		<0.0030	<0.0030	0.0526	<0.0030	0.0145
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421/WP	0.050	mg/L		96.3	45.3	40.7	12.5	60.6
Magnesium, dissolved	7439-95-4	E421/WP	0.0050	mg/L		27.7	14.2	12.0	5.41	17.0
Manganese, dissolved	7439-96-5	E421/WP	0.00010	mg/L		0.176	0.0115	0.00408	0.0126	0.672
Mercury, dissolved	7439-97-6	E509/WT	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Zinc, dissolved	7440-66-6	E421/WP	0.0010	mg/L		0.0015	<0.0010	0.0010	<0.0010	0.0066
Dissolved mercury filtration location	----	EP509/WT	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory
Dissolved metals filtration location	----	EP421/WP	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory
Aggregate Organics										
Biochemical oxygen demand [BOD]	----	E550/TY	2.0	mg/L		2.3	2.8	23.8	<2.0	<3.0 DLM
Chemical oxygen demand [COD]	----	E559-L/TY	10	mg/L		56	42	86	42	26
Phenols, total (4AAP)	----	E562/WT	0.0010	mg/L		0.0019	0.0020	0.0019	<0.0010	<0.0010

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page 1 of 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Environmental Division
Thunder Bay
Work Order Reference
TY2310464

Telephone : +1 807 623 6463

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Sault Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Kresin Engineering Corporation
Contact:	Accounting

Reports / Recipients

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☑ YES ☐ NO ☐ N/A
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Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: jennifer@kresinengineering.ca
Email 2:
Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: annette@kresinengineering.ca
Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.
Additional fees may apply to rush requests on weekends, holidays and after hours.
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #:	KECO100/TY2022KECO100001
Job #:	Blind River Landfill Fall
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): TY2310464
ALS Contact: Cassidy Young
Sampler: Jenn Sharpe

Analysis Request

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5, Coloumn 3	(Alkalinity, BOD, Cl, COD, Total Mercury	Conductivity, Total Metals (With Reportable	NH3,NO2, NO3, Total Phosphorus, pH,	Phenols 4AAP, SO4, TDS, TKN, TSS)	CO3, HCO3, OH	Ion Balnce, Dissolved Mercury	Dissolved Mn and Zn, hardness	DOC	SUSPECTED HAZARD (see notes)
1	SW1	11-Oct-23	2:40 pm	Surface Water	8	R							R	R	
2	SW2		3:30	Surface Water	8	R							R	R	
	SW3			Surface Water	8	R							R	R	
3	SW4		3:07 pm	Surface Water	8	R							R	R	
	SW5			Surface Water	8	R							R	R	
4	SW6		12:05	Surface Water	8	R							R	R	
5	SW7		4:00	Surface Water	8	R							R	R	
6															

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Surface water was field filtered in field for dissolved metals & DOC & dissolve Hg. There's 9/50 a VOC spike. Please compare to PWQO

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
11.3	11.4	8.0	9.6	9.6			

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	Oct. 11 2023	8pm

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	12-Oct-23	9:30

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

5 cooler Crozier

Appendix G
Analytical Data Summaries

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.1: Sampling Location - MW1-02
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event																																					
			2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
																												Duplicate														
Miscellaneous Parameters																																										
Nitrite (as N)	-	mg/L	NT	NT	<0.02	<0.02	0.07	<0.05	<0.03	<0.03	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.02	<0.02	<0.02	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT
Bicarbonate (HCO3)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	104.00	65.50	64.00	113.00	69.10	77.90	63.47	116.84	69.90	56.00	124.00	71.10	78.60	67.80	36.80	68.90	74.70	83.40	66.60	85.20	79.30	87.30	56.7	NT
Carbonate (CO3)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Hydroxide (OH)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	<5.0	<5.0	<5.0	<2.0	<2.0	NT	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Cyanide	0.2	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.002	<0.0020	<0.0050	<0.050
Ion Balance Calculation																																										
Cation - Anion Balance	-	%	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-5.80	19.70	4.13	NT	-2.70	4.80	-2.30	-16.40	-3.80	3.20	-19.50	-3.40	-5.10	8.20	-0.01	0.40	-3.60	4.40	8.10	-0.90	9.30	4.00	-4.65	-2.91
TDS (calculated)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	98.3	91.8	80.4	108	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	153	133
Anion Sum	-	me/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.99	1.37	1.29	NT	1.62	1.8	1.48	2.64	1.63	1.38	2.76	1.65	1.8	1.58	1.04	1.6	1.64	22.4	1.54	1.94	1.81	1.69	1.35	1.59
Cation Sum	-	me/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.77	2.04	1.65	NT	1.54	1.98	1.42	1.9	1.51	1.47	1.86	1.54	1.53	1.87	1.04	1.62	1.53	24.5	1.81	1.91	2.18	1.84	1.23	1.5
Inorganics																																										
Alkalinity	500	mg/L CaCO3	170	110	74	76	1	90	64	88	16	85	111	80.5	49.3	69.2	67.8	59.3	84.4	85.6	65.5	64	92.8	69.1	77.9	63.5	117	69.9	56	124	71.1	78.6	67.8	36.8	68.9	74.7	83.4	66.6	85.2	79.3	87.3	56.7	68.1
Ammonia	-	mg/L	0.35	1.62	0.04	0.04	0.02	0.087	0.083	0.246	0.06	0.02	0.02	<0.02	<0.02	<0.020	<0.020	<0.020	0.026	<0.02	0.044	<0.02	<0.02	<0.020	0.047	<0.020	0.136	0.219	0.029	0.024	0.095	0.107	0.157	0.267	<0.020	0.012	2.28	0.005	0.0227	0.0341	<0.010	0.0074	0.0059
Arsenic	0.025	mg/L	0.002	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.00037	NT	0.00074	NT
Barium	1	mg/L	0.071	0.23	0.01	0.1	0.01	0.021	0.0172	0.03	0.247	0.034	0.014	0.207	0.089	0.095	0.011	<0.010	<0.010	<0.01	0.011	<0.01	0.0138	<0.010	0.013	0.00769	0.0127	0.00874	0.00812	0.012	0.00892	0.0094	0.0149	0.0059	0.00889	0.00773	0.309	0.0119	0.0111	0.0124	0.027	0.00739	0.00966
Boron	5	mg/L	0.024	0.026	<0.05	<0.05	<0.05	0.022	0.01	0.02	0.09	<0.05	<0.05	0.055	<0.05	<0.050	<0.050	<0.050	<0.050	<0.05	<0.050	<0.05	0.016	<0.050	<0.050	0.013	0.014	0.011	0.011	0.018	<0.010	0.011	0.03	<0.010	0.011	0.011	0.011	0.015	0.014	0.018	0.017	<0.010	0.018
Cadmium	0.0001	mg/L	ND	ND	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0000091	NT	0.0000072	NT
Calcium	-	mg/L	36.1	40	22.6	22.6	36.9	19.8	16.6	22.9	6.6	20.6	30.3	21.1	14.6	19.9	20.1	15.9	23.3	20.7	23	18.8	24	17.8	21.7	16	21.3	17.4	17.1	20.7	17.7	18.6	20.7	11.1	18.3	17.4	187	20.3	21.5	23.4	20	13.3	17.1
Chloride	250	mg/L	20	1.5	1.3	2.3	2.5	1	0.9	0.64	1.8	2.1	1.9	1.54	0.97	1.66	1.07	0.78	0.98	0.77	0.76	0.7	0.81	0.67	0.75	0.65	0.86	0.78	0.82	0.9	0.77	0.75	0.64	0.83	0.67	0.87	729	0.63	1.04	0.86	0.91	0.74	0.79
Chromium	0.05	mg/L	0.016	0.08	<0.001	<0.001	<0.001	0.006	0.0053	0.0039	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	<0.0010	<0.001	<0.0020	<0.0010	<0.0010	0.00028	0.00067	0.00033	0.00031	0.00065	0.00031	0.00036	0.00022	0.00064	<0.0001	<0.0005	<0.0005	NT	0.00023	0.00056	NT	0.00076	NT
Conductivity	-	µS/cm	340	240	188	189	283	174	177	147	78	199	236	187	133	166	171	150	197	202	156	156	223	161	174	137	245	155	127	247	155	169	162	98.6	147	148	2590	148	180	170	169	128	153
Copper	1	mg/L	0.033	0.12	<0.001	<0.001	0.002	0.004	0.0019	0.004	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.00149	NT
Fluoride		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.023	0.043	<0.020	<0.020
Hardness		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	91.7	77.8	50.9	62.5
Iron	0.3	mg/L	8.4	46	0.1	<0.05	0.08	0.36	0.213	0.208	0.908	0.01	0.014	0.188	0.212	0.22	<0.050	<0.050	<0.050	<0.02	<0.02	<0.02	0.13	<0.020	0.068	0.012	0.017	<0.010	<0.010	<0.010	<0.010	0.302	0.125	0.081	<0.010	<0.010	18.5	0.012	0.21	0.02	0.017	0.098	0.066
Lead	0.01	mg/L	0.05	0.023	<0.001	<0.001	0.001	<0.001	0.001	<0.001	0.002	<0.01	<0.01	0.018	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.001	<0.00009	<0.0010	<0.0010	<0.0005	<0.00005	0.000202	<0.00005	0.000283	<0.00005	<0.00005	<0.000050	0.00104	<0.00005	<0.00005	<0.00005	<0.000050	<0.000050	<0.000050	NT	0.000064	NT
Magnesium	-	mg/L	11.3	20	6.43	6.39	10.3	5.67	5.2	6.63	2.33	6.36	8.59	6.33	4.13	5.21	5.37	4.76	7.06	5.62	6.15	5.64	7.01	5.05	6.95	4.74	6.26	4.8	4.59	6.13	4.96	5.11	6.62	3.3	5.48	5.18	55.2	6.02	6.17	8.07	6.75	4.29	4.81
Manganese	0.05	mg/L	1.06	1	0.139	0.151	0.145	0.119	0.0853	0.0617	0.054	0.0233	0.0634	0.0848	0.105	0.032	0.0205	0.0032	0.0519	0.0157	0.0392	0.0036	0.17	0.0171	0.0678	0.00685	0.37	0.0127	0.0132	0.0164	0.00299	0.151	0.123	0.0339	0.0981	0.0279	7.09	0.00704	0.129	0.0169	0.0134	0.0339	0.0107
Mercury	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0000050	NT	<0.0000050	NT
Nitrate	10	mg/L	<0.03	0.9	0.76	0.84	0.25	0.3	0.25	0.33	<0.03	0.32	0.27	0.126	0.12	0.348	0.157	0.215	0.182	0.107	0.154	0.137	0.064	0.224	0.057	0.173	0.289	0.142	0.048	0.049	0.079	0.054	0.89	0.086	0.256	0.039	0.25	0.16	0.101	0.102	0.085	<0.020	0.092
Nitrite	1	mg/L	<0.02	<0.02	<0.02	<0.02	0.07	<0.05	<0.03	<0.03	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.02	<0.02	<0.02	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT	<0.010	NT
Organic Nitrogen		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.261	0.181	0.275	0.199
TKN	-	mg/L	0.6	2.7	0.3	1.1	0.32	0.2	0.49	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.3	0.181	NT	0.205
pH	6.5-8.5	mg/L	7.25	7.59	7.2	7.2	7.3	6.64	6.45	6.92	6.6	7.06	6.89	6.86	6.9	7.04	6.8	7.24	7.2	7.29	6.97	7.04	7.27	7.02	6.7	6.67	7.14	7	6.54	7.35	6.78	6.93	6.52	6.85	7.04	6.99	7.23	6.83	7.03	7.61	7.75	7.33	7.28
Total Phosphorous	-	mg/L	0.39	NT	NT	NT	NT	0.212	0.392	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.858	NT	0.25	NT
Potassium	-	mg/L	4.55	6	1.8	1.31	2.48	1.7	1.71	1.7	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.09	1.67	0.88	1.59	0.8	NT	NT	NT	NT	NT	NT	NT	NT	0.89	0.549	1.02	0.86	2.25	1.38	1.55	1.65	NT	0.839	NT
Sodium	200	mg/L	11.2	9.7	6.38	7.19	11	6.11	6.49	6.32	4.49	8	10	7.13	5.76	5.88	6.53	4.45	8.98	5.78	7.77	5.18	6.51	4.85	6.36	4.65	6.01	5.15	4.9	6.46	5.09	5.25	5.6	3.89	5.12	4.84	214	6.19	6.18	6.91	5.9	4.27	5.09
Suspended Solids	-	mg/L	360	3140	<2	2	116	320	168.5	1390	3780	971	219	580	555	909	704	1090	1310	753	239	1370	667	1500	260	136	59.1	393	305	32.2	410	2000	144	1120	563	417	12700	883	243	9.29	1500	498	249
TDS	500	mg/L	198	253	150	110	220	200	190	170	290	270	130	184	232	158	216	174	212	152	196	117	136	129	156	126	141	175	126	132	224	272	136	167	137	199	2260	240	148	168	162	153	133
Sulfate	500	mg/L	70	7	12.8	13.7	ND	13	9.3	9.2	16.1	12.9	13.4	11	14	12	13.2	12.2	14.5	12.5	12.5	10.2	12.4	10	10.3	8.89	12.2	9.83	11.1	12.37	13.64	14.91	16.18	13.3	9.16	5.94	7.3	8.66	9.75	9.29	10.4	9.42	9.63
Zinc	5	mg/L	0.145	0.12	0.008	0.073	0.019	0.009	0.0044	0.0039	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0017	NT	0.0017	NT
Volatile Organics																																										
Benzene	1	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
1,4 Dichlorobenzene	5	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Dichloromethane	50	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<5.0	NT	<1.8	NT
Toluene	24	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Vinyl Chloride	2	µg/L	ND	NT	NT	NT	NT	<0.3	<0.2	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Other Organics																																										
BOD_5	-	mg/L	NT	<2	0.2	0.2	0.2	1	1.8	0.91	2	2	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0	<2.0	<3.0
COD	-	mg/L	31.9	5	NT	15	3	<20	<20	<20	19	<3	3	<3	7.6	<3	3.5	<3	9.4	7.8	4.1	<30	4.4	<10	<10	<10	12	<10	<10	<10	<10	<20	36	91	101	18	75	42	26	49	16	42	<10
DOC	5	mg/L	6	1.7	2	2	4	6.3	1.7	8.97	16	4	2	5	3.9	2	4.7	2	1.9	2	2.6	<5	2.3	2.5	2.9	6.4	8.3	2.4	2.4	2.8	2.8	13.9	4	9.9	1.73	4.29	11.7	2.42	4.41	3.11	3.2	4.42	2.63
Phenol	-	mg/L	6	1.7	2	2	4	0.004	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0010	NT	<0.0010	NT
Field Parameters																																										
pH	-										6.15	7.28	7.1	7.77	7.3	7.09	7.44	7.16	7.48	7.41	7.22	7.78	6.63	7.12	6.69	7.23	6.88	6.86		6.61	7.19	7.62	6.52	8.34	8.43	5.87	8.54	5.84	6.3	6.81	6.41	5.95	6.77
Conductivity	-	uS/cm									30	170	170	150	140	140	160	160	0.21	0.18	0.13	0.17	0.15	0.16	0.17	0.23	0.2	0.15		0.1	0.13	0.21	162	0.15	0.27	0.19	0.2	0.19	0.227	0.221	0.228	0.211	0.169
DO	-	%									67.4	27.3	35.8	47.5	36.2	37.1	30.3	26.5	33	43.3	41.4	22.3	32.3	27	61.6	27.7	32.3	41.5		24.4	36.1	38.6	34	45.1	27.9	42	35	37.4	36.2	29.8	33.4	25.4	55.10
Temp	-	°c									10.5	6.6	9.4	7.2	9.9	8.9	11.6	6.3	11.4	8.1	10.5	6.4	11.6	4.7	10.2	5	10.5	7.9		11.4	5.6	7.7	6.9	8.3	3.8	8	8.5	7.6	12.1	6.8	11.8	8.3	10.50
Pesticides																																										
2,3,4,6-Tetrachlorophenol	0.1	mg/L						<0.0005		<0.000079		<0.0005		Not Enough Water to Fill Pests.						<0.5																									
2,4,6-Trichlorophenol	0.005	mg/L						<0.0005		<0.000079		<0.0005								<0.5																								
2,4-Dichlorophenol	0.9	mg/L						<0.0005		<0.000079		<0.0005								<0.3																								
Pentachlorophenol	0.06	mg/L						<0.0005		<0.000079		<0.0005								<0.5																								
Aldicarb	0.009	mg/L						<0.0009		<0.0009		<0.0009								<0.001																								
Bendiocarb	0.04	mg/L						<0.0002		<0.0018		<0.0002								<0.0002																								
Carbaryl	0.09	mg/L						<0.0002		<0.0018		<0.0002								<0.0002																								
Carbofuran	0.09	mg/L						<0.0002		<0.0018		<0.0002								<0.0002																								
Diuron	0.15	mg/L						<0.01		<0.009		<0.01								<0.001																								
Temephos	0.28	mg/L						<0.0001		<0.025		<0.0001								<0.0001																								
4,4'-DDD	-	ug/L						NT		<0.00094		<0.1								<0.1																								
4,4'-DDE	-	ug/L						NT		<0.00031		<0.1								<0.1																								
4,4'-DDT	-	ug/L						NT		<0.00047		<0.1								<0.1																								
Aldrin	-	ug/L						NT		<0.00047		<0.02								<0.02																								
Dieldrin	-	ug/L						NT		<0.0013		<0.02								<0.02																								
Heptachlor	-	ug/L						NT		<0.00063		<0.1								<0.1																								
Heptachlor epoxide	-	ug/L						NT		<0.00063		<0.1								<0.1																								
Methoxychlor	0.9	ug/L						NT		<0.0013		<0.1								<0.1																								
o,p-DDT	-	ug/L						NT		<0.00031		<0.1								<0.1																								
Oxychlordane	-	ug/L						NT		NT		<0.1								<0.1																								
α-Chlordane	-	ug/L						NT		<0.00047		<0.1								<0.1																								
γ-BHC (Lindane)	-	ug/L						NT		<0.00047		<0.1								<0.1																								
γ-Chlordane	-	ug/L						NT		<0.00063		<0.1								<0.1																								
Alachlor	0.005	mg/L						<0.0001		<0.0008		<0.0001								<0.0001																								
Atrazine	-	mg/L						<0.0001		<0.0008		<0.0001								<0.0001																								
Azinphos-Methyl (Guthion)	0.02	mg/L						<0.0001		<0.0006		<0.0001								<0.00001																								
Chlorpyriphos (Dursban)	0.09	mg/L						<0.0001		<0.0006		<0.0001								<0.0001																								
Cyanazine (Bladex)	0.01	mg/L						<0.0001		<0.0006		<0.0001								<0.0001																								
Desethyl Atrazine	-	mg/L						<0.0001		<0.001		<0.0001								<0.0001																								
Diazinon	0.02	mg/L						<0.0001		<0.0006		<0.0001								<0.0001																								
Dimethoate	0.02	mg/L						<0.0001		<0.0006		<0.0001								<0.0001																								
Malathion	0.19	mg/L						<0.0001		<0.0006		<0.0001								<0.0001																								
Metolachlor	0.05	mg/L						<0.0001		<0.0004		<0.0001								<0.0001																								
Metribuzin (Sencor)	0.08	mg/L						<0.0001		<0.0004		<0.0001								<0.0001																								
Parathion	0.05	mg/L						<0.01		<0.0004		<0.0001								<0.0001																								
Phorate	0.002	mg/L						<0.0001		<0.00048		<0.0001								<0.0001																								
Prometryne	0.001	mg/L						<0.0001		<0.00021		<0.0001								<0.0001																								
Simazine	0.01	mg/L						<0.0001		<0.00048		<0.0001								<0.0001																								
Terbufos	0.001	mg/L						<0.0002		<0.0004		<0.0002								<0.0002																								
Triallate	0.23	mg/L						<0.0001		<0.0004		<0.0001								<0.0001																								
Trifluralin	0.045	mg/L						<0.0001		<0.0004		<0.0001								<0.0001																								
Benzo(a)pyrene	0.00001	mg/L						<0.00001		<0.00001		<0.00001								<0.00001																								
Total PCBs	0.003	mg/L						<0.00006		<0.00007		<0.00006								<0.035																								
2,4,5-T	0.28	mg/L						<0.0002		<0.000084		<0.0002								<0.0002																								
2,4-D	0.1	mg/L						<0.0002		<0.00033		<0.0002								<0.0002																								
Bromoxynil	0.005	mg/L						<0.0002		<0.0005		<0.0002								<0.0002																								
Dicamba	0.12	mg/L						<0.0002		<0.00033		<0.0002								<0.0002																								
Diclofop Methyl	0.009	mg/L						<0.0002		<0.00033		<0.0002								<0.0002																								
Dinoseb	0.01	mg/L						<0.0002		<0.000084		<0.0002								<0.0002																								
Picloram	0.19	mg/L						<0.0002		<0.000084		<0.0002								<0.0002																								
Atrazine + N-dealkylated metabolites	0.005	mg/L						NT		<0.0009		NT								<0.0002																

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.2: Sampling Location - MW2-02 - Source Well
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event																																		
			2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	May-12 DUPLICATE	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Miscellaneous Parameters																																									
Nitrite (as N)	-	mg/L																			<0.02	<0.020	<0.02	<0.02	<0.020	NT	<0.020	<0.2	<0.10	<0.10	<0.050	<0.050	NT	NT	NT	NT	NT	<0.20	<0.2	NT	<0.11	<0.200	<0.500
Bicarbonate (HCO3)	-	mg/L																		1350	1330	1160	1320	1550	1310	1460	1329	1359	1390	1490	1440	1550.0	1570	1590.0	1520.0	1650.0	1650.0	1640.0	1620.0	1650.0	1640.0	1580	NT
Carbonate (CO3)	-	mg/L																		<5	<5	<5.0	<5.0	<5.0	<2	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	NT
Hydroxide (OH)	-	mg/L																		<5	<5	<5.0	<5.0	<5.0	<2	<2	NT	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	NT
Cyanide	0.2	mg/L																		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0023	0.0035	<0.0050	NT
Ion Balance Calculation																																									
Cation - Anion Balance	-	%																		-11.7	2.3	7.8	5.53	NT	3	-1.6	-2.9	6.1	-3.7	3.2	8.1	6.5	5.3	-4.4	2	-7.2	5	-10.4	4.2	-6.5	7	-0.52	4.7
TDS (calculated)	-	mg/L																		1270	1400	1470	1890	1590	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1950	1570	1760
Anion Sum	-	me/L																		28.3	27.8	25.4	31.5	NT	33.3	32	32.8	34.5	36.4	37.3	35.2	37.4	37.8	38.9	37.5	40.5	40.2	39.6	40.1	39.4	35	38.9	40.8
Cation Sum	-	me/L																		22.4	29.1	29.7	37.9	NT	35.4	31	30.9	38.9	33.8	39.8	41.4	42.6	42	35.6	39.1	35.1	44.4	32.1	43.6	34.6	40.7	38.5	44.8
Inorganics																																									
Alkalinity	500	mg/L CaCO3	1550	998	1050	1020	1020	800	854	900	1140	959	1020	1010	1110	1140	1140	1060	1190	1100	1090	1160	1320	1270	1310	1260	1330	1360	1390	1490	1440	1550	1570	1590	1520	1650	1650	1640	1620	1650	1640	1580	1680
Ammonia	-	mg/L	179	49	0.02	44.8	45.2	49.9	1.07	49.3	64.8	50.5	58.4	64.7	75.8	54.2	71.9	74.2	78.8	70.8	80.5	77.7	73.9	86.2	77.9	91.8	86.3	98.8	107	101	108	139	118	133	135	148	130	130	134	141	147	119	132
Arsenic	0.025	mg/L	0.009	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.01	0.0021	0.002	<0.010	0.001	<0.010	<0.010	<0.01	NT	NT	<0.01	<0.02	<0.0010	NT	<0.0010	<0.0010	<0.002	<0.0010	0.00094	0.00107	0.00107	0.00119	0.00096	NT	0.001	0.00097	<0.0010	<0.0010	<0.0010	<0.00100	0.00127
Barium	1	mg/L	0.561	0.39	0.12	0.19	0.37	0.226	0.272	0.393	0.39	0.4	0.4	0.21	0.215	0.49	0.566	0.53	0.49	0.19	0.48	0.46	0.48	0.454	0.45	0.456	0.442	0.48	0.462	0.498	0.465	0.469	0.452	0.459	0.116	0.419	0.454	0.383	0.451	0.423	0.423	0.34	0.456
Boron	5	mg/L	1.11	1.1	0.69	1.06	0.94	1.1	1.06	1.04	1.13	1.1	0.9	1.36	1.29	1.22	1.29	1.51	1.68	0.96	1.22	1.18	1.87	1.5	1.27	1.54	1.64	1.62	1.76	1.67	1.6	1.91	1.58	2.11	1.79	1.96	1.91	1.92	1.83	2.06	2.07	1.88	2.18
Cadmium	0.0001	mg/L	1.002	<0.0001	<0.0001	0.0002	0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0010	<0.000090	<0.00090	<0.0010	<0.00047	NT	<0.00017	<0.00017	<0.0010	<0.000017	NT	<0.00005	<0.00005	<0.0001	<0.00005	<0.000025	<0.0000005	<0.0000050	<0.0000050	<0.0000005	NT	<0.00005	<0.0000050	<0.000050	<0.0000050	<0.000050	<0.0000050	<0.0000050
Calcium	-	mg/L	362	270	202	204	210	202	201	194	180	151	216	192	206	214	217	220	205	136	189	189	281	187	186	183	182	189	196	188	193	192	188	194	168	194	195	170	184	191	163	166	185
Chloride	250	mg/L	245	93.2	74.2	65	73.2	85	145	99.2	125	105	128	145	172	197	206	208	240	217	212	228	228	252	251	241	220	257	305	267	230	230	230	253	253	266	255	238	270	229	287	260	255
Chromium	0.05	mg/L	0.074	0.008	0.006	<0.001	0.015	0.061	0.0279	0.034	0.002	0.01	0.01	0.0092	0.0043	<0.010	0.0039	<0.010	<0.010	<0.010	<0.01	<0.010	0.018	<0.002	0.0033	0.0033	0.0029	0.0033	0.0025	0.0029	0.00321	0.00354	0.0037	0.00452	0.0023	<0.0050	0.0037	0.00394	0.0033	<0.0050	<0.0050	<0.00500	0.00433
Conductivity	-	µS/cm	3790	2000	2050	1970	1880	1310	2010	1160	1950	1990	1970	2150	2130	2250	2470	2430	2790	2600	2530	2790	3200	2930	3220	2960	3070	3060	3180	3320	3330	3620	3440	3430	3390	3450	3550	3530	3590	3670	2960	3400	3670
Copper	1	mg/L	0.064	0.011	0.001	<0.001	<0.001	<0.001	0.0023	0.0017	<0.001	<0.01	<0.01	<0.001	<0.001	<0.010	0.0018	<0.010	<0.010	<0.01	NT	<0.010	<0.01	<0.02	<0.0010	NT	<0.002	<0.002	<0.004	<0.002	0.0021	<0.0002	<0.00020	<0.00020	<0.0002	NT	<0.0020	0.00032	<0.0020	NA	<0.0020	<0.00200	<0.00020
Fluoride	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.025	<0.10	<0.400	NT
Hardness	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	806	731	703	NT
Iron	0.3	mg/L	198	130	12.6	11.6	103	51.3	33.1	41.6	110	105	102	3.06	7.4	102	98.4	92.1	86	<0.2	79.3	89	72.1	64	77	80.6	81.3	81.6	75.5	70	73	63.7	68.9	69.6	0.282	67.3	65.8	64.8	65.7	62.9	62.2	62.3	62.2
Lead	0.01	mg/L	0.026	0.0062	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.010	<0.0010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.00009	<0.0010	<0.0010	<0.0005	<0.0005	<0.001	<0.0005	<0.00025	<0.00005	<0.000050	<0.000050	<0.00005	<0.0005	<0.0005	<0.000050	<0.00050	<0.00050	<0.00050	<0.000500	<0.000050
Magnesium	-	mg/L	66	51	31.1	29.8	31.2	33.4	47	32.7	31.9	31.9	43.5	41.6	46.9	46.4	49.8	45.7	50.4	34.3	45.3	47.7	85.7	52.6	53.7	59	56.8	60.1	64.2	65.3	65.1	67.9	67.7	73.4	72.1	74.2	76.4	69.2	74.1	79.8	78.6	70	84.3
Manganese	0.05	mg/L	3.37	1.1	0.827	0.899	0.839	0.81	0.893	0.727	0.774	0.71	0.62	0.566	0.578	0.63	0.525	0.635	0.536	0.43	0.583	0.44	0.809	0.503	0.503	0.454	0.418	0.383	0.397	0.455	0.424	0.397	0.413	0.376	0.368	0.411	0.406	0.391	0.362	0.427	0.345	0.358	0.361
Mercury	0.001	mg/L	ND	<0.0001	<0.0001	<0.0001	0.008	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	NT	<0.000001	<0.000001	<0.00005	<0.000066	<0.000005	<0.000005	<0.000005	<0.000005	<0.000025	<0.000005	<0.000005	<0.0000050	<0.0000050	<0.0000005	<0.00025	<0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Nitrate	-	mg/L	NT	<0.03	<0.03	0.07	<0.07	<0.1	<0.1	<0.1	<0.03	<0.03	0.16	<0.03	0.041	<0.030	<0.030	<0.030	<0.15	<0.03	NT	0.057	<0.030	<0.030	0.067	<0.030	<0.030	<0.4	<0.20	0.21	0.18	<0.20	<0.030	<0.20	0.28	<0.04	<0.20	<0.20	<0.40	<0.20	0.1	<0.400	<1.00
Nitrite	1	mg/L	<0.2	<0.2	<0.1	0.32	<0.1	<0.05	<0.03	<0.03	<0.02	<0.02	<0.1	<0.2	<0.2	<0.020	<0.40	<0.40	<0.10	0.023	<0.02	<0.020	<0.02	<0.02	<0.020	NT	<0.20	<0.2	<0.10	<0.10	<0.05	<0.05	<0.10	0.16	0.24	NT	NT	<0.20	<0.20	<0.010	<0.050	<0.200	<0.500
Organic Nitrogen	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	22	<33	<16.2	<18.1
TKN	-	mg/L	9.2	56.4	47.1	42.4	47	45.3	29.6	49.6	62.3	56.4	60	66.4	87.3	64.2	75.7	72.6	85.9	73.6	NT	88.2	90.2	111	NT	90.1	81.8	96.7	96.1	117	132	133	128	135	NT	145	138	150	163	164	NT	144
pH	6.5-8.5	mg/L	7.17	7.17	7.1	7	6.9	6.42	6.53	6.58	7	7.02	7.13	7.67	7.17	6.97	6.86	7.15	6.87	7.18	7.28	7.34	6.9	7.28	6.82	6.83	6.68	6.82	6.69	6.79	6.69	6.87	6.87	6.83	6.97	6.94	7.29	6.88	6.91	7.17	7.1	7.27	7.28
Total Phosphorous		mg/L	3.58	NT	NT	NT	NT	0.274	0.271	0.301	0.245	0.273	0.203	0.169	1.53	0.586	0.772	0.599	0.693	1.38	NT	NT	0.61	0.319	0.516	NT	0.242	0.245	0.223	0.254	0.386	0.489	0.448	0.286	0.341	NT	0.242	0.764	0.312	0.657	0.228	1.6	0.248
Potassium	-	mg/L	126	65	53.9	48.1	59.3	51.6	85.4	64.2	63.2	54.6	73.8	82.7	89	108	119	145	140	107	143	156	167	165	159	NT	168	169	185	169	179	170	183	207	177	186	193	174	176	173	186	164	178
Sodium	200	mg/L	218	100	76.1	69.3	74.7	91	140	108	110	83.2	110	115	129	137	138	148	160	114	151	157	168	176	181	198	196	203	229	224	234	225	236	249	242	252	245	230	247	246	248	227	285
Suspended Solids		mg/L	1900	489	430	240	270	570	314	274	655	208	467	247	1070	864	1340	616	546	1510	729	1360	488	556	533	342	246	237	204	372	319	244	262	150	255	176	168	173	232	1.39	370	178	188
TDS	500	mg/L	2580	1050	1120	1050	1120	1000	1210	1030	1230	1050	1060	1210	1290	1330	1360	1240	1360	1020	1310	1390	1560	1580	1610	1450	1500	1600	1640	1570	1590	1650	1660	1680	1660	1690	1720	1460	1680	1790	1390	1570	1760
Sulfate	500	mg/L	<1.0	1.6	0.9	2.5	2.1	2.2	<1.0	<1	2.2	1.2	<0.3	0.35	2.27	<0.30	<0.30	0.82	<1.5	0.72	1.07	<0.30	167	<0.3	5.09	0.87	<6.0	<6.0	<3.0	<3.0	<1.5	<1.5	<3.0	<3.0	<6.0	<6.0	<3.0	<6.0	7.1	1.39	<1.5	<6.00	<15.0
Zinc	5	mg/L	3.67	0.43	0.006	0.026	0.007	0.026	0.0882	0.132	0.008	<0.03	<0.03	0.0472	0.0205	<0.030	0.0119	<0.030	0.036	<0.03	NT	NT	<0.03	<0.2	<0.0030	NT	<0.010	<0.010	<0.020	<0.010	<0.005	0.0033	0.0015	0.0048	0.0022	NT	<0.010	0.0015	<0.010	<0.010	0.011	<0.0100	0.0016
Volatile Organics																																										
Benzene	1	µg/L	2.7	NT	NT	NT	1.2	2	1.8	1.9	2.1	1	<1	1.3	1.64	1.67	1.63	1.84	1.95	1.52	1.52	1.78	1.93	1.89	1.85	NT	2.02	2.07	2.23	2.46	2.12	2.28	2.4	2.93	2.29	2.97	2.63	2.22	2.68	2.63	2.63	2.38	2.34
1,4 Dichlorobenzene	5	µg/L	<0.3	NT	NT	NT	NT	<0.3	<0.25	<0.25	1.2	<0.001	<0.001	1.1	1.59	1.08	1.18	1.18	1.23	0.82	0.82	1.07	1.1	0.76	0.71	NT	0.92	1.03	1.11	1.29	1.09	1.18	0.97	1.22	1.05	1.17	1.1	0.87	1.23	1.04	0.91	0.99	0.99
Dichloromethane	50	µg/L	<0.5	NT	NT	NT	NT	<0.3	<0.25	<0.25	<0.5	<0.001	<0.01	<0.001	<0.5	<0.5	<0.50	<0.50	<0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	NT	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<5.0	<2.0	<1.9	<1.0
Toluene	24	µg/L	<0.5	NT	NT	NT	NT	0.6	<0.25	<0.25	<1	<1	<1	<0.001	<0.5	<0.5	<0.50	<0.50	<0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	NT	<0.5	<0.5	<0.5	<0.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.50	<0.50	<0.50	<0.50	<0.40	<0.50	<0.50
Vinyl Chloride	2	µg/L	<0.5	NT	NT	NT	NT	<0.3	<0.2	<0.25	<2	<2	<2	<0.002	<0.5	<0.5	<0.50	<0.50	<0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	NT	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene		µg/L	NT	NT	NT	NT	NT	NT	4.19	3.99	3	2	<0.01	2.8	4.3	NT	3.39	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	5.78	NT	NT	NT	NT	5.51	NT	NT
Other Organics																																										
BOD_5	-	mg/L	NT	47	5	<2	15	10	20	6.8	25	8	7	8.3	14.3	11.9	9.3	8.6	10.6	7.6	8.5	13	8.3	15.3	15.2	14.1	9.4	9.9	8.3	10	10.1	8.3	9.5	5.7	10.4	9.9	12	12	11.9	9.9	8.1	<3.0	13.4
COD	-	mg/L	6350	100	NT	102	125	70	170	66	147	161	115	114	946	401	152	187	145	134	270	392	271	236	202	224	192	215	196	239	239	240	247	240	273	228	229	256	265	284	250	276	252
DOC	5	mg/L	732	30.1	19	26	32	67	57.5	45	43	39	32	51.8	30.3	41.3	45.2	40.7	47.5	39	38	42.1	83	72.6	64	65.4	30.6	64.7	63.6	59.8	68.8	66.1	83.8	66.7	61	95.9	91.1	76.8	67.5	82.1	73.7	67.7	74.5
Phenol	-	mg/L	NT	0.001	0.017	0.013	0.017	0.028	0.0145	0.0127	0.026	0.016	0.02	0.019	0.0127	0.0141	0.0097	0.0209	0.0123	0.0165	NT	0.0078	0.0053	0.004	0.0222	NT	0.004	0.0121	0.0093	<0.020	0.046	<0.020	0.0019	<0.020	0.0021	NT	NT	0.0068	0.0052	0.0053	NT	0.0033	0.0
Field Parameters																																										
pH	-											6.75	6.83	6.65	6.72	6.82	7.52	7.12	6.78	6.59	6.59	6.61	6.58	6.5	2.69	6.9	6.45	6.58	6.73	6.59	6.63	6.84	6.87	6.75	6.46	6.7	6.67	5.95	6.73	6.6	6.51	6.6	6.72
Conductivity	-	uS/cm										2060	2190	2270	2420	2350	2460	2580	3.1	10.8	10.8	3.08	3.37	2.67	3	2.92	2.56	2.76	2.79	2.49	2.44	3.78	3.44	3.44	3.48	3.08	3.12	3.14	3.767	3.66	3.65	3.66	3.356
DO	-	%										25.5	26.1	29.7	11.5	15.7	19.4	9.5	27.9	2.94	2.94	26.6	19.5	5.2	6.7	10.6	10.4	16.1	27.5	32.5	6.6	19.1	18.6	15.5	14.2	16.2	14.6	9.5	18.1	15.8	33.2	15.8	19.7
Temp	-	°c										10.9	10.8	14	13.4	13.8	15.3	13.5	14.7	13.3	13.3	15.1	12.7	13	10.2	11.4	10.1	12.2	12.3	13	11	11.7	12.7	11.3	10.8	12.6	10.9	12	12.8	10.8	12.8	10.8	11.3
Pesticides																																										
2,3,4,6-Tetrachlorophenol	0.1	mg/L					<0.0005		<0.000093		<0.0005		<0.0005							<0.5																								
2,4,6-Trichlorophenol	0.005	mg/L					<0.0005		<0.000093		<0.0005		<0.0005							<0.5																								
2,4-Dichlorophenol	0.9	mg/L					<0.0005		<0.000093		<0.0005		<0.0005							<0.3																								
Pentachlorophenol	0.06	mg/L					<0.0005		<0.000093		<0.0005		<0.0005							<0.5																								
Aldicarb	0.009	mg/L					<0.0009		<0.0027		<0.009		<0.001							<0.001																								
Bendiocarb	0.04	mg/L					<0.0002		<0.001		<0.0002		<0.0002							<0.00085																								
Carbaryl	0.09	mg/L					<0.0002		<0.001		<0.0002		0.0006							0.00132																								
Carbofuran	0.09	mg/L					<0.0002		<0.001		<0.0002		<0.0002							<0.0002																								
Diuron	0.15	mg/L					<0.01		<0.005		<0.01		<0.001							<0.0001																								
Temephos	0.28	mg/L					<0.0001		<0.014		<0.0001		<0.0001							<0.0001																								
4,4'-DDD	-	ug/L					NT		<0.0012		<0.1		<0.1							<1																								
4,4'-DDE	-	ug/L					NT		<0.00041		<0.1		<0.01							<1																								
4,4'-DDT	-	ug/L					NT		<0.00061		<0.1		<0.1							<1																								
Aldrin	-	ug/L					NT		<0.00061		<0.02		<0.02							<1.18																								
Dieldrin	-	ug/L					NT		<0.0016		<0.02		<0.02							<0.2																								
Heptachlor	-	ug/L					NT		<0.00081		<0.1		<0.1							<1																								
Heptachlor epoxide	-	ug/L					NT		<0.00081		<0.1		<0.1							<1																								
Methoxychlor	0.9	ug/L					NT		<0.0016		<0.1		<0.1							<1																								
o,p-DDT	-	ug/L					NT		<0.00041		<0.1		<0.1							<1																								
Oxychlordane	-	ug/L					NT		NT		<0.1		<0.1							<1																								
α-Chlordane	-	ug/L					NT		<0.00061		<0.1		<0.1							<1																								
γ-BHC (Lindane)	-	ug/L					NT		<0.00061		<0.1		<0.1							<1																								
γ-Chlordane	-	ug/L					NT		<0.00081		<0.1		<0.1							<1																								
Alachlor	0.005	mg/L					<0.0001		<0.00095		<0.0001		<0.0001							<0.0001																								
Atrazine	-	mg/L					<0.0001		<0.00095		<0.0001		<0.0001							<0.0001																								
Azinphos-Methyl (Guthion)	0.02	mg/L					<0.0001		<0.00071		<0.0001		<0.0001							<0.0001																								
Chlorpyriphos (Dursban)	0.09	mg/L					<0.0001		<0.00071		<0.0001		<0.0001							<0.0001																								
Cyanazine (Bladex)	0.01	mg/L					<0.0001		<0.00071		<0.0001		<0.0001							<0.0001																								
Desethyl Atrazine	-	mg/L					<0.0001		<0.0012		<0.0001		<0.0001							<0.0001																								
Diazinon	0.02	mg/L					<0.0001		<0.00071		<0.0001		<0.0001							<0.0001																								
Dimethoate	0.02	mg/L					<0.0001		<0.00071		<0.0001		<0.0001							<0.0001																								
Malathion	0.19	mg/L					<0.0001		<0.00071		<0.0001		<0.0001							<0.0001																								
Metolachlor	0.05	mg/L					<0.0001		<0.00047		<0.0001		<0.0001							<0.0001																								
Metribuzin (Sencor)	0.08	mg/L					<0.0001		<0.00047		<0.0001		<0.0001							<0.0001																								
Parathion	0.05	mg/L					<0.01		<0.00047		<0.0001		<0.0001							<0.0001																								
Phorate	0.002	mg/L					<0.0001		<0.00049		<0.0001		<0.0001							<0.0001																								
Prometryne	0.001	mg/L					<0.0001		<0.00025		<0.0001		<0.0001							<0.0001																								
Simazine	0.01	mg/L					<0.0001		<0.00049		<0.0001		<0.0001							<0.0001																								
Terbufos	0.001	mg/L					<0.0002		<0.00047		<0.0002		<0.0002							<0.0002																								
Triallate	0.23	mg/L					<0.0001		<0.00047		<0.0001		<0.0001							<0.0001													

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.3: Sampling Location - MW3-02
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event																																		
			2002	Mar-04	Nov-04	May-05	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Miscellaneous Parameters							Dry Well				Dry Well					Dry Well	Dry Well	Dry Well		Dry Well	Dry Well	Dry Well	Dry Well	Dry Well		Dry Well					Frozen								
Nitrite (as N)		mg/L																	NT						NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT	NT	<0.010	NT
Bicarbonate (HCO3)		mg/L																	337.3855						306	NT	282	250	276			228	272	188	243	277	277	285	NT
Carbonate (CO3)		mg/L																	<2.0						<2.0	NT	<2.0	<2.0	<2.0			<2.0	<2.0	<2.0	<2.0	<2.0	18.2	<2.0	NT
Hydroxide (OH)		mg/L																	<2.0						<2.0	NT	<2.0	<2.0	<2.0			<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Cyanide	0.2	mg/L																	NT						NT	NT	NT	NT	NT			NT	NT	NT	NT	<0.0020	<0.0020	<0.0050	<0.0050
Ion Balance Calculation																																							
Cation - Anion Balance		%																	-0.2						1.8	NT	-2.5	-6.6	-7.1			-2.5	-0.4	2.8	-2.8	-0.8	4	-4.69	1.1
TDS (calculated)		mg/L																	NT						NT	NT	NT	NT	NT			NT	NT	NT	NT	NT	346	374	370
Anion Sum		me/L																	8.48						7.64	NT	7.24	8.11	8.43			6.72	7.08	5.12	6.3	6.55	5.9	6.92	6.27
Cation Sum		me/L																	8.45						7.92	NT	6.89	7.1	7.31			6.39	7.03	5.42	5.96	6.45	6.44	6.3	6.41
Inorganics																																							
Alkalinity	500	mg/L CaCO3	NT	NT	346	313		NT	329	302		296	361	349	379				325						339		306	254	282	250	276		228	272	188	243	277	296	285	257
Ammonia	-	mg/L	NT	NT	2.06	1.73		NT	NT	0.37		NT	NT	0.458	1.06				NT						1.09		1.21	0.275	0.286	0.138	0.462		0.163	0.198	1.16	0.21	0.198	0.12	0.077	0.0235
Arsenic	0.025	mg/L	NT	NT	0.001	0.001		0.0039	NT	NT		NT	NT	NT	NT				NT						NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	0.00028	NT	0.00032	NT
Barium	1	mg/L	NT	NT	0.5	0.09		0.0763	NT	0.153		0.42	NT	0.115	0.111				NT						0.0476		0.0376	0.0264	0.0223	0.0227	0.0192		0.0154	0.0151	0.133	0.0137	0.0198	0.0346	0.0152	0.0144
Boron	5	mg/L	NT	NT	0.31	0.35		0.431	NT	0.5		0.43	NT	0.295	0.5				NT						0.6		0.453	0.364	0.282	0.267	0.528		0.432	0.362	0.115	0.292	0.309	0.355	0.437	0.54
Cadmium	0.0001	mg/L	NT	NT	<0.0001	<0.0001		<0.001	NT	NT		NT	NT	NT	NT				NT						NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	1.18E-05	NT	6.7E-06	NT
Calcium	-	mg/L	NT	NT	79.4	66		63.9	66.5	57.7		70.6	NT	81.6	88.4				NT						72.8		66.9	55.9	60.9	65.6	67.2		52	54.7	48.6	49.3	58.5	55.5	53.8	54.6
Chloride	250	mg/L	NT	NT	51	49.7		NT	76.3	71.5		102	117	123	126				108						56.3		44.4	70.7	54.3	109	54		68.1	56.5	47.8	49.5	36.3	31.9	42.6	36.2
Chromium	0.05	mg/L	NT	NT	0.002	<0.001		0.0102	NT	NT		NT	NT	NT	NT				NT						<0.0010		0.00088	NT	0.0006	0.00111	0.00066		0.00066	0.00094	NT	0.001	0.00081	NT	0.00082	NT
Conductivity	-	µS/cm	NT	NT	820	760		NT	780	813		871	937	953	1090				969						812		718	662	704	854	713		636	666	502	602	639	555	600	582
Copper	1	mg/L	NT	NT	0.001	<0.001		0.0238	NT	NT		NT	NT	NT	NT				NT						NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	NA	NT	0.00483	NT
Fluoride		mg/L																	NT						NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.02	<0.020	<0.020	<0.020
Hardness		mg/L																	NT						NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	212	208	197	196
Iron	0.3	mg/L	NT	NT	0.6	0.54		2.79	NT	0.049		0.118	NT	<0.050	0.353				NT						0.79		0.809	0.576	0.3	0.061	0.183		0.035	0.086	7.5	0.135	0.467	0.097	0.164	0.157
Lead	0.01	mg/L	NT	NT	<0.001	<0.001		0.0059	NT	<0.01		0.015	NT	<0.0010	<0.0010				NT						<0.00050		0.000118	NT	<0.00005	0.000661	<0.000050		0.000064	<0.00005	<0.000050	<0.000050	<0.000050	NT	<0.000050	NT
Magnesium	-	mg/L	NT	NT	19.9	16.4		16.6	17.6	16.1		18.3	NT	20.5	23.1				NT						18.1		17.2	13.9	15.9	16.4	16.2		13.6	14.1	12.9	11.9	16.1	17	15.2	14.4
Manganese	0.05	mg/L	NT	NT	0.412	0.418		0.178	NT	0.0155		0.0806	NT	0.262	0.341				NT						0.579		0.646	NT	0.367	0.288	0.226		0.0477	0.0092	0.706	0.217	0.458	0.248	0.122	0.102
Mercury	0.001	mg/L	NT	NT	<0.0001	<0.0001		<0.0001	NT	NT		NT	NT	NT	NT				NT						NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.0000050	<0.0000050	NT	NT
Nitrate	10	mg/L	NT	NT	0.14	0.1		NT	0.38	0.12		0.145	0.104	0.094	<0.030				0.489						0.263		0.091	0.13	0.032	0.1	0.154		0.107	0.075	0.294	0.18	0.021	<0.020	0.041	<0.020
Nitrite	1	mg/L	NT	NT	<0.02	0.08		NT	NT	NT		NT	NT	NT	NT				0.129						NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	0.01	NT	<0.010	NT
Organic Nitrogen		mg/L	NT	NT	NT	NT		NT	NT	NT		NT	NT	NT	NT				NT						NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	0.877	1.02	0.923	0.688
TKN	-	mg/L	NT	NT	3.05	2.4		NT	NT	NT		NT	NT	NT	NT				NT						NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	1.07	1.14	NT	0.711
pH	6.5-8.5	mg/L	NT	NT	7.8	7.6		NT	8	7.95		8.39	8.33	7.93	7.38				8.39						7.7		7.6	7.51	7.58	7.65	7.51		7.85	7.95	7.41	7.89	8.2	8.49	8.09	8.36
Total Phosphorous	-	mg/L	NT	NT	NT	NT		NT	NT	NT		NT	NT	NT	NT				NT						NT		NT	NT	NT	NT	NT		```	NT	NT	NT	0.0662	NT	0.0379	NT
Potassium	-	mg/L	NT	NT	32.5	28.7		1.7	NT	NT		NT	NT	NT	NT				NT						NT		NT	NT	34.4	30	33.7		30.5	34.9	4.81	27.6	26.8	NT	26.7	NT
Sodium	200	mg/L	NT	NT	50.1	55.6		6.11	63.4	55.8		65.9	NT	70.8	73.5				NT						41.4		40	47.8	37.5	38.8	39.3		43.2	51.3	29.8	41.3	33.9	35	38.3	40.9
Suspended Solids	-	mg/L	NT	NT	4	6		NT	495	3380		275	152	130	5890				64						498		90.9	58.5	35.3	126	28.1		19.3	13.9	279	55	<0.30	34.6	52.7	63.8
TDS	500	mg/L	NT	NT	490	470		NT	570	530		562	658	629	722				556						538		444	414	427	487	457		365	390	282	378	393	372	374	370
Sulfate	500	mg/L	NT	NT	<0.2	5		NT	9.9	11.9		5.67	3.62	2.09	0.48				2.14						4.48		13.1	10	3.72	1.64	66.2		11.4	2.83	<0.30	1.53	<0.30	0.49	1.09	5.62
Zinc	5	mg/L	NT	NT	0.045	0.023		0.0278	NT	NT		NT	NT	NT	NT				NT						NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	0.0092	NT	0.0046	NT
Volatile Organics																																							
Benzene	5	µg/L	NT	NT	NT	NT			NT	NT		NT	NT	NT	NT										NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.50	NT	<0.50	NT
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	NT			NT	NT		NT	NT	NT	NT										NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.50	NT	<0.50	NT
Dichloromethane	50	µg/L	NT	NT	NT	NT			NT	NT		NT	NT	NT	NT										NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	<5.0	NT	<1.8	NT
Toluene	24	µg/L	NT	NT	NT	NT			NT	NT		NT	NT	NT	NT										NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.50	NT	<0.50	NT
Vinyl Chloride	2	µg/L	NT	NT	NT	NT			NT	NT		NT	NT	NT	NT										NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.50	NT	<0.50	NT
Other Organics																																							
BOD_5	-	mg/L	NT	NT	<2	<2			NT	3		<2.0	2.5	2.9	6										7.5		4.9	<2.0	<2.0	2.4	<2.0		<2.0	<2.0	6.1	2.4	<2.0	<3.0	<2.0	<2.0
COD	-	mg/L	NT	NT	NT	43			NT	126		NT	NT	66.3	106										169		70	53	52	56	63		49	47	67	63	64	61	51	43
DOC	5	mg/L	NT	NT	12	15			NT	17		NT	NT	18.5	21.6										24.8		18.1	15.2	18.2	21.1	15.9		13.7	18	10.3	15.8	18.2	19.4	15.6	18.4
Phenol	-	mg/L	NT	NT	0.003	0.002			NT	NT		NT	NT	NT	NT										NT		NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.0010	NT	<0.0010	NT
Field Parameters																																							
pH	-								7.75	7.41	7.88	7.54	7.66	7.62	8.04	8.02	8.09	7.86	7.82					7.17	7.32	6.57	6.4	6.6	7.84	7.25	7.17		7.49	7.83	7.09	7.62	6.76	6.38	6.52	7.16
Conductivity	-	uS/cm							720	760	730	770	750	840	870	1000	1.04	58.3	0.94					0.72	0.65	0.62	0.57	0.56	0.74	0.7	0.71		0.56	0.61	0.58	0.673	0.622	0.641	0.68	0.614
DO	-	%							83.5	54.9	85.4	80.2	77.3	40.3	52.8	26.5	65.3	1.03	86.7					52.4	66.4	67.4	81.8	82.7	90.4	73.7	87.9		73	95.7	74	86.5	67.7	71.2	68	85.2
Temp	-	°c							11.7	11.7	8.7	11.9	7.9	16.9	10.9	11	15.2	12.7	12.3					7.5	12.9	14.5	15.1	9.3	5	9.5	5		13.1	8.2	14.9	15.3	10.3	16	14.6	10.3
Pesticides																																							
2,3,4,6-Tetrachlorophenol	0.1	mg/L																																					
2,4,6-Trichlorophenol	0.005	mg/L																																					
2,4-Dichlorophenol	0.9	mg/L																																					
Pentachlorophenol	0.06	mg/L																																					
Aldicarb	0.009	mg/L																																					
Bendiocarb	0.04	mg/L																																					
Carbaryl	0.09	mg/L																																					
Carbofuran	0.09	mg/L																																					
Diuron	0.15	mg/L																																					
Temephos	0.28	mg/L																																					
4,4'-DDD	-	ug/L																																					
4,4'-DDE	-	ug/L																																					
4,4'-DDT	-	ug/L																																					
Aldrin	-	ug/L																																					
Dieldrin	-	ug/L																																					
Heptachlor	-	ug/L																																					
Heptachlor epoxide	-	ug/L																																					
Methoxychlor	0.9	ug/L																																					
o,p-DDT	-	ug/L																																					
Oxychlordane	-	ug/L																																					
α-Chlordane	-	ug/L																																					
γ-BHC (Lindane)	-	ug/L																																					
γ-Chlordane	-	ug/L																																					
Alachlor	0.005	mg/L																																					
Atrazine	-	mg/L																																					
Azinphos-Methyl (Guthion)	0.02	mg/L																																					
Chlorpyriphos (Dursban)	0.09	mg/L																																					
Cyanazine (Bladex)	0.01	mg/L																																					
Desethyl Atrazine	-	mg/L																																					
Diazinon	0.02	mg/L																																					
Dimethoate	0.02	mg/L																																					
Malathion	0.19	mg/L																																					
Metolachlor	0.05	mg/L																																					
Metribuzin (Sencor)	0.08	mg/L																																					
Parathion	0.05	mg/L																																					
Phorate	0.002	mg/L																																					
Prometryne	0.001	mg/L																																					
Simazine	0.01	mg/L																																					
Terbufos	0.001	mg/L																																					
Triallate	0.23	mg/L																																					
Trifluralin	0.045	mg/L																																					
Benzo(a)pyrene	0.00001	mg/L																																					
Total PCBs	0.003	mg/L																																					
2,4,5-T	0.28	mg/L																																					
2,4-D	0.1	mg/L																																					
Bromoxynil	0.005	mg/L																																					
Dicamba	0.12	mg/L																																					
Diclofop Methyl	0.009	mg/L																																					
Dinoseb	0.01	mg/L																																					
Picloram	0.19	mg/L																																					
Atrazine + N-dealkylated metabolites	0.005	mg/L																																					
Chlordane (total)	7	ug/L																																					
Aldrin + Dieldrin	0.7	ug/L																																					

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.4: Sampling Location - MW4-02
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event																																							
			2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	Oct-12 Duplicate	May-13	Oct-13	May-14	Oct-14	May-15	May-15	Oct-15	Jun-16	Oct-16	Oct-16 Duplicate	May-17	Nov-17	May-18	Nov-18	Feb-20 Frozen	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Miscellaneous Parameters																																												
Nitrite (as N)	-	mg/L																		<0.02	<0.020	<0.020	0.155	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT	NT	<0.010	NT
Bicarbonate (HCO3)	-	mg/L																		208	115	116	113	163	145	150	138	135.861	161.8237	139	135	131	124	149	122	87.6		121	112	143	133	126	138	148	NT
Carbonate (CO3)	-	mg/L																		<5	<5	<5	<5.0	<5.0	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Hydroxide (OH)	-	mg/L																		<5	<5	<5	<5.0	<5.0	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Cyanide	0.2	mg/L																		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.0020	<0.0020	<0.0050	<0.0050
Ion Balance Calculation																																												
Cation - Anion Balance	-	%																		0.7	5.1	3.4	3.75	NT	-11.4	0.8	3.5	4	1.9	1.3	1.6	3	1	-1.7	-5.4	2.6		2.3	3.2	-0.7	-1	1.7	4	-3.86	-2.46
TDS (calculated)	-	mg/L																		290	284	283	188	200	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT	191	233	312
Anion Sum	-	me/L																		5.38	4.75	4.8	3.03	NT	5.08	4.08	3.94	3.77	4.44	3.9	3.75	3.62	3.25	3.81	4.27	3.73		3.2	3.1	3.89	3.42	4.01	3.25	4.04	4.38
Cation Sum	-	me/L																		5.45	5.27	5.14	3.75	NT	4.03	4.15	4.22	4.08	4.61	4.01	3.86	3.84	3.32	3.68	3.83	3.93		3.35	3.3	3.83	3.35	4.15	3.55	3.74	4.17
Inorganics																																											
Alkalinity	500	mg/L CaCO3	254	221	171	252	165	190	182	263	139	154	156	142	174	218	242	145	200	171	115	116	113	133	145	150	138	136	162	139	135	131	124	149	122	87.6		121	112	143	133	126	138	148	97
Ammonia	-	mg/L	1.08	0.13	1.38	2.18	1.42	1.29	0.845	1.52	1	0.83	0.84	0.801	0.905	1.15	1.34	1.1	1.36	2.86	1.06	1.07	0.717	0.897	0.884	0.86	0.961	0.861	1.06	1.18	0.803	0.789	0.645	0.766	0.607	0.595		0.84	0.646	0.589	0.817	0.424	0.76	0.568	0.637
Arsenic	0.025	mg/L	0.051	0.026	<0.001	<0.001	<0.001	<0.001	0.0022	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	0.00021	NT	0.00012	NT
Barium	1	mg/L	1.03	0.98	0.12	0.2	0.09	0.114	0.223	0.125	0.419	0.084	0.081	0.073	0.169	0.182	0.196	0.162	0.125	0.128	0.093	0.092	0.058	0.0769	0.088	0.084	0.0802	0.0767	0.0907	0.0743	0.0761	0.0749	0.0534	0.0715	0.0657	0.0605		0.057	0.0629	0.0642	0.0604	0.0664	0.0613	0.0549	0.0637
Boron	5	mg/L	0.232	0.14	0.1	0.14	0.14	0.16	0.101	0.152	0.14	0.1	0.1	0.075	0.17	0.174	0.255	0.119	0.214	0.161	0.076	0.081	0.087	0.01	0.097	0.151	0.105	0.105	0.131	0.117	0.091	0.078	0.086	0.117	0.077	0.066		0.099	0.08	0.098	0.085	0.068	0.118	0.086	0.091
Cadmium	0.0001	mg/L	0.001	ND	<0.0001	<0.0001	<0.0001	<0.0001	0.00019	<0.0001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.0000050	NT	<0.0000050	NT
Calcium	-	mg/L	63.2	80	37.6	54.6	37.3	34.3	28.2	51	32	31.3	32.3	32.8	38.3	49.1	56.6	57.1	46.4	38.7	37.1	35.5	25.3	28.7	27.4	29.2	31.6	31.6	30.8	30.4	28.5	27.9	23.9	28.4	28.6	25.8		23.8	24	29.5	26	29.4	26.1	26.9	30.5
Chloride	250	mg/L	37.5	61	21.8	41.1	26.7	35.5	22.9	41.5	50	34.4	24.3	28.7	37.3	63.8	64.6	134	69.2	67.8	98.2	99.1	40.9	40.9	74.7	38.5	41.5	36.7	42.4	37.9	36.9	35	27.1	29.4	63.8	66.1		26.8	30.6	34.2	26.6	51.6	33.9	38.4	85.5
Chromium	0.05	mg/L	0.279	0.18	<0.001	<0.001	0.001	0.009	0.0164	0.0078	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0010	<0.0010	<0.0010	0.002	<0.002	<0.0010	<0.0010	0.00047	0.00034	0.00051	0.00051	0.00048	0.0004	0.00036	0.0005	0.00139	0.00047		<0.0005	0.0005	NT	0.00053	<0.00050	NT	<0.00050	NT
Conductivity	-	µS/cm	432	609	417	614	403	397	422	487	390	409	378	370	439	591	671	767	598	584	573	575	356	378	551	435	397	411	451	360	364	356	323	373	467	378		300	303	379	328	426	326	373	475
Copper	1	mg/L	0.932	0.72	0.001	<0.001	<0.001	0.011	0.0767	0.0057	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NA	NT	0.00032	NT
Fluoride	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.02	0.048	<0.020	<0.020
Hardness	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	114	103	105	114
Iron	0.3	mg/L	165	130	1.4	0.48	3	2.22	7.03	1.84	0.537	4.18	4.38	0.828	1.34	1.52	4.11	<0.050	4.78	3.61	4.74	4.36	4.32	4.58	3.42	3.22	4.02	3.97	4.17	3.69	4	4.02	4.14	4.03	3.92	4.32		3.61	3.61	3.92	4.09	5.33	3.93	4.92	4.7
Lead	0.01	mg/L	0.224	0.21	<0.001	<0.001	<0.001	0.004	0.0284	0.0014	<0.001	<0.01	<0.01	0.019	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000054	0.000575	<0.000050		<0.00005	<0.00005	0.014100	<0.000050	<0.000050	NT	<0.000050	NT
Magnesium	-	mg/L	37.8	45	11.5	16.1	10.7	10.2	9.51	15.5	10	10.4	9.16	10	11.7	13.3	23.1	4.76	14	10.4	9.83	8.51	9.7	8.12	9.45	9.52	8.59	9.05	8.73	8.53	8.52	7.71	8.2	9.19	7.68		7.9	7.57	8.83	7.75	9.79	9.14	9.28	9.27
Manganese	0.05	mg/L	1.85	1.3	0.276	0.357	0.246	0.297	0.31	0.323	0.286	0.294	0.241	0.3	0.314	0.426	0.458	0.457	0.383	0.355	0.407	0.389	0.271	0.31	0.29	0.282	0.324	0.326	0.303	0.276	0.281	0.281	0.258	0.303	0.256	0.269		0.27	0.279	0.325	0.279	0.414	0.333	0.292	0.303
Mercury	0.001	mg/L	ND	ND	<0.0001	<0.0001	0.0015	<0.0001	<0.0001	<0.0001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.0000050	NT	<0.0000050	NT
Nitrate	10	mg/L	ND	0.1	<0.03	0.07	0.002	<0.1	<0.12	<0.1	<0.03	<0.03	<0.03	0.053	<0.03	0.034	<0.030	<0.030	0.089	<0.03	<0.030	<0.030	0.039	0.124	0.161	<0.030	<0.020	<0.020	0.031	0.022	0.032	<0.02	<0.02	<0.02	<0.020	0.026		<0.020	0.041	0.071	<0.020	<0.020	<0.020	<0.020	<0.020
Nitrite	1	mg/L	ND	ND	<0.02	<0.02	0.39	<0.05	<0.03	<0.03	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.02	<0.020	<0.020	0.155	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.010	NT	<0.010	NT
Organic Nitrogen		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	0.765	0.24	0.492	0.273
TKN	-	mg/L	2.3	1.9	1.78	2.63	2.18	1.5	1..02	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	1.19	1	NT	0.91
pH	6.5-8.5	mg/L	7.11	7.6	7.3	7.3	7.3	6.68	6.91	7.14	7.3	7.04	7.25	7.23	7.34	7.53	7.28	7.32	7.18	7.53	7.56	7.52	7.02	7.28	7.29	6.87	7.02	7.02	7.05	6.96	7.04	6.94	6.93	7.04	6.9	7.07		7.44	7.29	7.05	7.31	7.45	8.17	7.54	7.37
Total Phosphorous	-	mg/L	2.26	NT	NT	NT	NT	0.348	5.07	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT	NT	0.255	NT
Potassium	-	mg/L	21.4	26	12.5	15	13.4	1.7	10.5	18.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	18.1	10.1	12.8	14.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	11.4	8.56	8.89		11.1	9.17	7.79	10	8.02	NT	7.17	NT
Sodium	200	mg/L	31.9	48	26.9	41.3	26.9	6.11	29.4	40.4	26	27	26.9	22.6	29.9	37.2	44.8	51	50.4	39.8	46.3	46.4	34	27.5	31.5	29.2	27	25.5	37	27.6	25.1	25.2	22.8	24.5	26.8	34.4		23.4	22.8	26.6	21.2	31.5	27.9	28.1	32.4
Suspended Solids	-	mg/L	20.1	6830	4	8	718	1410	4410	416	410	95.6	25	66.6	142	394	404	331	266	662	176	177	112	126	1870	793	NT	216	298	617	208	815	280	186	230	500		333	965	916	804	1.34	162	418	238
TDS	500	mg/L	820	450	260	390	290	300	340	330	270	250	210	237	296	371	440	458	340	292	374	306	184	224	301	311	237	250	274	283	194	253	202	253	274	248		195	332	311	232	298	215	233	312
Sulfate	500	mg/L	ND	1.7	0.3	2.6	2.4	1	<1.0	1.3	2.5	2.7	0.3	0.55	1.53	0.62	<0.30	1.73	<0.30	2.66	4.75	4.77	0.33	0.31	2.59	<0.30	0.57	0.45	<0.30	2.86	0.45	0.52	0.71	0.63	1.63	5.62		1.48	<0.30	3.01	<0.30	1.34	<0.30	<0.30	1.47
Zinc	5	mg/L	0.502	0.38	0.011	0.048	0.003	0.006	0.0357	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.0010	NT	0.0017	NT
Volatile Organics																																											
Benzene	5	µg/L	NT	NT	NT	NT	ND	<0.3	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.50	NT	<0.50	NT
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	NT	NT	<0.3	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.50	NT	<0.50	NT
Dichloromethane	50	µg/L	NT	NT	NT	NT	NT	<0.3	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<5.0	NT	<1.9	NT
Toluene	24	µg/L	NT	NT	NT	NT	NT	<0.3	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.50	NT	<0.50	NT
Vinyl Chloride	2	µg/L	NT	NT	NT	NT	NT	<0.3	<0.2	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.50	NT	<0.50	NT
Other Organics																																											
BOD_5	-	mg/L	NT	5	<2	<2	2	2	1.7	0.9	<2	<2	<2	<2	2	<2.0	3.5	<2.0	<2.0	2.2	<2.0	2.4	<2.0	5.4	2.8	2.9	<2.0	<2.0	<2.0	3.7	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		2.1	2.4	<2.5	<2.0	3.1	<3.0	<2.0	<2.0
COD	-	mg/L	837	31.6	NT	33	40	20	27	29	17	17	25	13.3	25.8	26	34.3	20.6	28.6	21.3	25	23.7	12.3	24.7	39	49	24	15	36	15	20	23	21	41	50	91		32	60	47	31	51	22	46	34
DOC	5	mg/L	432	609	417	614	403	16	12.6	13.8	9	7	7	4.3	5.5	9.2	17.1	7.1	10	7.5	6.7	8.2	8.7	6.8	8.1	9.3	8.2	6.8	10.6	6.7	9.9	7.1	9	7.5	21.2	4.6		7.6	7.4	7.49	6.61	6.7	8.12	6.4	6.47
Phenol	-	mg/L	NT	0.001	0.002	0.002	0.002	0.003	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	<0.0010	NT	<0.0010	NT
Field Parameters																																											
pH	-										6.87	6.71	7.04	7.06	7.27	7.45	7.55	7.24	7.31	7.11	6.86	6.86	6.51	6.77	7.45	6.9	6.96	6.96	6.97	6.04	6.07		6.55	7.11	7.42	7.27		8.15	8.22	7.44	6.95	6.62	5.71	6.33	6.88
Conductivity	-	uS/cm									360	370	330	310	390	540	540	660	0.62	0.57	0.58	38.2	0.34	0.36	0.48	0.39	0.35	0.35	0.4	0.33	0.3		0.27	0.42	0.48	0.42		0.3	0.3	0.33	0.372	0.534	0.412	0.421	0.508
DO	-	%									63.3	41.1	59.1	51.4	36.8	37.1	40.4	33.7	24.9	37.5	38.2	0.58	27.5	35.5	21	12.2	13.5	13.5	20.7	24.4	28.8		32.3	22.2	34.8	21.2		19.3	17.5	19.2	21.9	70	26.2	19.3	40.8
Temp	-	°c									10.3	7.9	10	9.2	10	10.6	11.5	7.4	12.3	8.1	11.2	11.2	6.9	11.6	5.1	10.5	5.5	5.5	11.5	10.4	12.5		7	8.7	7.5	7.2		9.1	9	8.9	11.8	9.4	11.9	9	10.4
Pesticides																																											
2,3,4,6-Tetrachlorophenol	0.1	mg/L							<0.0005		<0.0001		<0.5		<0.0005					<0.0005																									
2,4,6-Trichlorophenol	0.005	mg/L							<0.0005		<0.0001		<0.5		<0.0005					<0.0005																									
2,4-Dichlorophenol	0.9	mg/L							<0.0005		<0.0001		<0.5		<0.0005					<0.0003																									
Pentachlorophenol	0.06	mg/L							<0.0005		<0.0001		<0.5		<0.0005					<0.0005																									
Aldicarb	0.009	mg/L							<0.0009		<0.00086		<0.009		<0.001					<0.001																									
Bendiocarb	0.04	mg/L							<0.0002		<0.0023		<0.0002		<0.0002					<0.0002																									
Carbaryl	0.09	mg/L							0.00018		<<0.0023		<0.0002		<0.0002					<0.0002																									
Carbofuran	0.09	mg/L							<0.0002		<0.0023		<0.0002		<0.0002					<0.0002																									
Diuron	0.15	mg/L							<0.01		<0.012		<0.01		<0.001					<0.001																									
Temephos	0.28	mg/L							<0.0001		<0.024		<0.0001		<0.0001					<0.0001																									
4,4'-DDD	-	ug/L							NT		<0.00098		<0.1		<0.1					<0.1																									
4,4'-DDE	-	ug/L							NT		<0.00033		<0.1		<0.01					<0.1																									
4,4'-DDT	-	ug/L							NT		<0.00049		<0.1		<0.1					<0.1																									
Aldrin	-	ug/L							NT		<0.00049		<0.02		<0.02					<0.02																									
Dieldrin	-	ug/L							NT		<0.0013		<0.1		<0.02					<0.02																									
Heptachlor	-	ug/L							NT		<0.00066		<0.1		<0.1					<0.1																									
Heptachlor epoxide	-	ug/L							NT		<0.00066		<0.1		<0.1					<0.1																									
Methoxychlor	0.9	ug/L							NT		<0.0013		<0.1		<0.1					<0.1																									
o,p-DDT	-	ug/L							NT		<0.00033		<0.1		<0.1					<0.1																									
Oxychlordane	-	ug/L							NT		NT		<0.1		<0.1					<0.1																									
α-Chlordane	-	ug/L							NT		<0.00049		<0.1		<0.1					<0.1																									
γ-BHC (Lindane)	-	ug/L							NT		<0.00049		<0.1		<0.1					<0.1																									
γ-Chlordane	-	ug/L							NT		<0.00066		<0.1		<0.1					<0.1																									
Alachlor	0.005	mg/L							<0.0001		<0.00081		<0.0001		<0.0001					<0.0001																									
Atrazine	-	mg/L							<0.0001		<0.00081		<0.0001		<0.0001					<0.0001																									
Azinphos-Methyl (Guthion)	0.02	mg/L							<0.0001		<0.00061		<0.0001		<0.0001					<0.0001																									
Chlorpyriphos (Dursban)	0.09	mg/L							<0.0001		<0.00061		<0.0001		<0.0001					<0.0001																									
Cyanazine (Bladex)	0.01	mg/L							<0.0001		<0.00061		<0.0001		<0.0001					<0.0001																									
Desethyl Atrazine	-	mg/L							<0.0001		<0.001		<0.0001		<0.0001					<0.0001																									
Diazinon	0.02	mg/L							<0.0001		<0.00061		<0.0001		<0.0001					<0.0001																									
Dimethoate	0.02	mg/L							<0.0001		<0.00061		<0.0001		<0.0001					<0.0001																									
Malathion	0.19	mg/L							<0.0001		<0.00061		<0.0001		<0.0001					<0.0001																									
Metolachlor	0.05	mg/L							<0.0001		<0.0004		<0.0001		<0.0001					<0.0001																									
Metribuzin (Sencor)	0.08	mg/L							<0.0001		<0.0004		<0.0001		<0.0001					<0.0001																									
Parathion	0.05	mg/L							<0.01		<0.0004		<0.0001		<0.0001					<0.0001																									
Phorate	0.002	mg/L							<0.0001		<0.00048		<0.0001		<0.0001					<0.0001																									
Prometryne	0.001	mg/L							<0.0001		<0.00021		<0.0001		<0.0001					<0.0001																									
Simazine	0.01	mg/L							<0.0001		<0.00048		<0.0001		<0.0001					<0.0001																									
Terbufos	0.001	mg/L							<0.0002		<0.0004		<0.0002		<0.0002					<0.0002																									
Triallate	0.23	mg/L							<0.0001		<0.0004		<0.0001		<0.0001					<0.0001																									
Trifluralin	0.045	mg/L							<0.0001		<0.0004		<0.0001		<0.0001					<0.0001																									
Benzo(a)pyrene	0.00001	mg/L							<0.00001		<0.00001		<0.00001		<0.00001					<0.00001																									
Total PCBs	0.003	mg/L							<0.00006		<0.00008		NT		<0.00002					<0.000035																									
2,4,5-T	0.28	mg/L							<0.0002		<0.000097		<0.0002		<0.0002					<0.0002																									
2,4-D	0.1	mg/L							<0.0002		<0.00039		<0.0002		<0.0002					<0.0002																									
Bromoxynil	0.005	mg/L							<0.0002		<0.0005		<0.0002		<0.0002					<0.0002																									
Dicamba	0.12	mg/L							<0.0002		<0.00039		<0.0003		<0.0002					<0.0002																									
Diclofop Methyl	0.009	mg/L							<0.0002		<0.00039		<0.0002		<0.0002					<0.0002																									
Dinoseb	0.01	mg/L							<0.0002		<0.000097		<0.0002		<0.0002					<0.0002																									
Picloram	0.19	mg/L							<0.0002		<0.000097		<0.0002		<0.0002																													
Atrazine + N-dealkylated metabolites	0.005	mg/L							NT		<0.0009		NT	

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.5: Sampling Location - MW5-02
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event																																
			2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Miscellaneous Parameters																																									
Nitrite (as N)	-	mg/L																		<0.02	<0.020	<0.02	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT	<0.010	NT
Bicarbonate (HCO3)	-	mg/L																		53.6	49.7	40.1	63.4	38.7	49.6	46.27244	52.03213	53	53.4	48.8	48.4	49.6	53.1	47.4	55.5	52.4	51.4	50.5	48.8	49.5	49.6	NT
Carbonate (CO3)	-	mg/L																		<2	<5.0	<5.0	<5.0	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Hydroxide (OH)	-	mg/L																		<5	<5.0	<5.0	<5.0	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Cyanide	0.2	mg/L																		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0020	<0.0020	<0.0050	<0.0050
Ion Balance Calculation																																									
Cation - Anion Balance	-	%																		3.2	4.6	10.68	NT	8.2	-4.8	-7	-4.9	-2.1	-1.3	-4.7	-8.3	-9.2	-3.2	-2.2	-5.3	1.2	-7	-3.7	-3.3	3	-6.78	-7.17
TDS (calculated)	-	mg/L																		63.1	69.4	60.6	67.6	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	119	NT	NT	61.7	89	96
Anion Sum	-	me/L																		1.16	1.15	0.92	NT	1.01	1.29	1.13	1.31	1.33	1.32	1.25	1.25	1.26	1.33	1.25	1.36	1.29	1.26	1.27	1.22	1.06	1.26	1.27
Cation Sum	-	me/L																		1.24	1.26	1.32	NT	1.19	1.17	0.99	1.18	1.28	1.29	1.14	1.06	1.05	1.25	1.19	1.22	1.33	1.1	1.17	1.14	1.12	1.1	1.1
Inorganics																																									
Alkalinity	500	mg/L CaCO3	242	57.8	52	50	54	40	40	45	50	47	51	47	50.2	49.8	44.8	42.8	45	43.9	49.7	40.1	51.9	38.7	49.6	46.4	52.1	53	53.4	48.8	48.4	49.6	53.1	47.4	55.5	52.4	51.4	50.5	48.8	49.5	49.6	50.8
Ammonia	-	mg/L	ND	ND	0.07	0.03	<0.02	0.02	0.118	0.192	0.05	0.02	<0.02	<0.02	<0.02	<0.020	<0.020	<0.020	0.026	<0.02	<0.020	0.281	<0.02	<0.020	<0.020	0.024	<0.020	0.055	<0.020	0.058	0.044	0.119	0.327	<0.02	0.018	<0.0050	<0.0050	0.013	0.0244	<0.010	<0.0050	0.0133
Arsenic	0.025	mg/L	ND	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0002	NT	0.0002	NT
Barium	1	mg/L	0.033	0.025	<0.01	0.07	<0.01	0.009	0.0081	0.0099	0.0206	0.031	0.01	0.118	0.072	0.041	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01	0.00847	<0.010	<0.010	0.00705	0.0094	0.008	0.00792	0.0076	0.00715	0.00704	0.00737	0.00697	0.00785	0.00812	0.0098	0.00798	0.00762	0.0221	0.00675	0.00736
Boron	5	mg/L	0.024	0.017	<0.05	<0.05	<0.05	0.007	0.0085	0.0082	<0.05	<0.05	<0.05	<0.03	<0.05	<0.050	<0.050	<0.050	<0.050	<0.05	<0.050	<0.05	0.01	<0.050	<0.050	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	0.0001	mg/L	ND	ND	<0.0001	0.0001	<0.0001	0.0002	0.00011	<0.0001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0000128	NT	0.0000067	NT
Calcium	-	mg/L	20.3	16	16.1	15.1	15.9	12.5	9.59	12.3	13.8	12.6	14.8	15	15	14.4	15.5	13.7	14.4	14.3	14.3	14.6	13.5	14.1	13.4	11.5	13.6	15.6	15	12.8	12.1	11.8	14.1	13.8	13.9	15.4	12.2	13.4	12.9	12.1	11.9	12.3
Chloride	250	mg/L	22.5	1	1	2.9	73.2	1	0.84	0.71	2.8	1.8	1.8	2.1	0.97	1.56	1.06	0.65	0.81	0.131	0.84	0.63	0.68	0.51	0.64	0.45	0.67	0.66	0.58	1.15	0.73	0.57	0.68	0.76	0.93	1.41	1.08	1.22	1.05	1.1	1.1	1.02
Chromium	0.05	mg/L	0.004	ND	<0.001	<0.001	<0.001	0.003	0.0044	0.0024	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0026	0.0033	0.004	0.0035	0.0031	0.003	0.00271	0.0037	0.0034	0.00106	0.00287	0.00358	0.00356	0.00368	0.00404	0.00343	0.00463	NT	0.00349	0.00408	NT	0.00448	NT
Conductivity	-	µS/cm	177	144	142	143	139	117	132	104	136	128	138	133	136	129	127	119	123	124	135	110	121	101	131	109	117	130	124	119	119	126	126	115	127	124	124	119	117	110	120	124
Copper	1	mg/L	0.032	0.017	0.001	0.002	0.001	0.002	0.0018	0.0024	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NA	NT	NT	0.00518	NT
Fluoride		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.022	0.038	<0.020	<0.020
Hardness		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	48.5	47.4	46.4	46.5
Iron	0.3	mg/L	0.32	1.2	<0.05	<0.05	<0.05	0.02	0.02	<0.02	1.04	0.007	0.003	0.0233	<0.05	<0.050	<0.050	<0.050	<0.050	<0.02	<0.020	<0.02	<0.1	<0.020	<0.020	<0.010	<0.010	<0.010	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	<0.010	<0.010	0.014	<0.010	<0.010
Lead	0.01	mg/L	0.005	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.01	<0.01	0.012	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00009	<0.0010	<0.0010	<0.0010	0.000202	0.000265	<0.00005	<0.00005	0.000602	<0.00005	<0.00005	0.000133	0.000058	<0.000050	<0.000050	<0.000050	NT	0.000144	NT
Magnesium	-	mg/L	4.46	5.6	4.73	4.52	4.6	3.6	3.19	3.72	4.34	3.87	4.28	4.34	4.32	4.01	4.37	4.12	4.32	4.01	4.09	4.51	4.13	3.59	3.94	3.29	3.9	3.82	4.2	3.82	3.47	3.54	4.08	4.02	4.21	4.43	3.95	3.95	3.98	4.19	4.04	3.83
Manganese	0.05	mg/L	0.361	0.88	0.325	0.276	0.312	0.135	0.054	0.0555	0.254	0.0105	0.00114	0.0045	0.0069	0.0115	0.0022	0.0025	0.0014	<0.0010	<0.0010	0.0012	0.0009	0.0039	0.0043	0.00071	0.0054	0.00281	0.0234	0.00468	0.001	0.00107	0.00042	0.00185	0.00083	0.00083	0.0006	0.0006	0.00076	0.00096	0.00065	0.00093
Mercury	0.001	mg/L	ND	ND	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0000050	NT	0.0000156	NT
Nitrate	10	mg/L	ND	0.1	<0.03	0.16	<0.1	<0.1	<0.1	<0.1	0.13	0.08	0.1	0.114	0.157	0.099	<0.030	0.069	0.099	0.131	0.121	0.051	0.084	0.255	0.192	0.147	0.101	0.173	0.11	0.094	0.127	0.139	0.149	0.303	0.164	0.128	0.105	0.053	0.154	0.091	0.105	0.109
Nitrite	1	mg/L	ND	ND	<0.02	<0.02	<0.03	<0.05	<0.03	<0.03	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.02	<0.020	<0.02	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT	<0.010	NT
Organic Nitrogen		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.113	0.057	0.204	0.083
TKN	-	mg/L	0.6	1	0.14	0.94	0.22	0.14	0.2		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.137	0.057		0.096
pH	6.5-8.5	mg/L	7.27	7.67	7.4	7.8	7.4	6.59	7	7.16	7.9	7.39	7.4	7.4	7.82	7.35	7.26	7.36	7.49	7.48	7.65	7.45	7.64	7.22	7.35	7.42	7.1	7.68	7.3	7.32	7.52	7.63	7.48	7.41	7.78	7.84	7.6	7.41	7.82	7.89	7.76	7.55
Total Phosphorous	-	mg/L	0.23	NT	NT	NT	NT	0.09	0.11	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0456	NT	0.0255	NT
Potassium	-	mg/L	2.77	1.7	2.27	1.49	1.52	1.7	1.63	1.78	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.34	1.56	1.36	1.32	1.26	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.09	1.07	1.25	1.02	1.13	0.985	NT	1.02	NT
Sodium	200	mg/L	9.1	6.1	4.85	7.64	5.76	6.11	4.31	4.12	6.79	5.39	6.41	4.35	4.32	4.15	4.93	4.79	5.13	3.65	3.83	3.69	3.58	3.49	3.43	2.72	3.49	3.41	3.68	3.35	3.24	3.04	3.46	3.37	3.46	3.64	3.16	3.45	3.3	3.41	3.41	3.23
Suspended Solids	-	mg/L	378	108	<2	<2	76	40	73	190	174	50.8	89.2	262	84	47.1	180	150	224	22.2	41.5	50.5	2.7	365	226	81.1	35.8	193	10.9	108	308	976	75.2	95.2	71.3	67.1	139	53	9.52	44.8	79.1	64.8
TDS	500	mg/L	153	106	100	100	110	100	130	72	140	90	100	109	120	101	122	83	88	80	76	59	85	81	116	94	82	102	91	91	116	385	111	91	100	94	119	90	89	79	89	96
Sulfate	500	mg/L	62.5	9.2	12.8	15	2.1	13	11.4	9.2	16.8	12.3	13.9	13.2	15.7	12.7	13.5	12.6	14.3	12.2	2.14	11.5	12.9	9.67	12.8	8.85	11.4	11.8	11.1	11.2	12.3	11.6	11.4	12.3	10	9.5	9.53	10.5	9.52	9.74	11.2	10.4
Zinc	5	mg/L	0.154	0.11	0.009	0.058	0.01	0.005	0.0027	0.0032	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0065	NT	0.0043	NT
Volatile Organics																																									
Benzene	5	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	<0.25	NT	<0.5	NT	<0.5	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
1,4 Dichlorobenzene	5	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	<0.25	NT	<0.5	NT	<0.5	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Dichloromethane	50	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	<0.25	NT	<0.5	NT	<0.5	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<5.0	NT	<1.9	NT
Toluene	24	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	<0.25	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Vinyl Chloride	2	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	<0.25	NT	<0.5	NT	<0.5	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Other Organics																																									
BOD_5	-	mg/L	NT	ND	<2	<2	<2	1	3.2	1.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	<2.0	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0	<2.0	<2.0
COD	-	mg/L	20	16.4	NT	17	<3	<20	<20	<20	7	<3	5	<3	4.8	<3	<3	5.6	<3	<3	6.3	<3.0	6.8	11	17	13	<10	14	<10	<10	<20	30	<20	<10	<20	23	22	14	<10	<10	<10
DOC	5	mg/L	6	1.1	2	33	2	2	2	3.5	24	2	2	1.4	1.5	1.8	2.6	1.9	2.2	1.5	2.4	6	1.6	11.5	2	8.6	1.4	4.7	4.3	2.6	2.9	8.9	2.4	1.44	3.19	2.03	2.37	2.79	3.35	1.96	1.85	1.4
Phenol	-	mg/L	NT	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0016	NT	<0.0010	NT
Field Parameters																																									
pH	-										7.65	7.91	7.53	7.47	7.73	8.17	7.48	7.32	8.23	8.2	7.52	8	6.92	7.09	7.05	7.42	7.28	5.86	6.65	6.44	7.78	7.86	7.82	8.39	6.2	8.35	6	6.85	7.14	6.9	6.41	7.13
Conductivity	-	µS/cm									80	80	80	80	80	80	70	90	0.11	0.09	0.09	0.09	0.1	0.07	0.08	0.07	0.09	0.07	0.07	0.07	0.13	0.12	0.14	0.13	0.12	0.12	0.12	0.141	0.139	0.14	0.126	0.118
DO	-	%									64	53.3	68.8	52.3	51.5	57.2	42.9	30.6	56.2	64.7	63.2	35.8	49.4	46	50.1	39.1	53.5	67.2	43.6	61.7	79.5	59.8	75.5	58.4	58.7	73.7	61.4	65.3	55.3	63.3	66.7	68.5
Temp	-	°c									10.3	8.6	9.2	7.9	9.5	10.5	11.2	7.1	11.8	7.8	10.6	6.8	10.4	5.2	9.9	5	10.8	8.5	11.6	5.7	7.5	7.8	7.8	4.6	8.6	8.4	8.4	12	7.4	12.8	9.5	10.9
Pesticides																																									
2,3,4,6-Tetrachlorophenol	0.1	mg/L									<0.00051		<0.0005		<0.0005					<0.0005																							
2,4,6-Trichlorophenol	0.005	mg/L									<0.00051		<0.0005		<0.0005					<0.0005																							
2,4-Dichlorophenol	0.9	mg/L									<0.00051		<0.0005		<0.0005					<0.0003																							
Pentachlorophenol	0.06	mg/L									<0.00051		<0.0005		<0.0005					<0.0005																							
Diuron	0.15	mg/L						<0.01			<0.0055		<0.01		<0.001					<0.001																							
Temephos	0.28	mg/L						<0.03			<0.015		<0.0001		<0.0001					<0.0001																							
Benzo(a)pyrene	0.00001	mg/L						<0.00001			NT		<0.00001		<0.00001					<0.00001																							
4,4'-DDD	-	ug/L									<0.00063		<0.1		<0.1					<0.0001																							
4,4'-DDE	-	ug/L									<0.00021		<0.1		<0.1					<0.0001																							
4,4'-DDT	-	ug/L									<0.00031		<0.1		<0.1					<0.0001																							
Aldrin	-	ug/L									<0.00031		<0.02		<0.02					<0.0002																							
Dieldrin	-	ug/L									<0.00084		<0.02		<0.02					<0.0002																							
Heptachlor	-	ug/L									<0.00042		<0.1		<0.1					<0.0001																							
Heptachlor epoxide	-	ug/L									<0.00042		<0.1		<0.1					<0.0001																							
Methoxychlor	0.9	ug/L									<0.00084		<0.1		<0.1					<0.0001																							
o,p-DDT	-	ug/L									<0.00021		<0.1		<0.1					<0.0001																							
Oxychlordane	-	ug/L									<0.00052		<0.1		<0.1					<0.0001																							
α-Chlordane	-	ug/L									<0.00031		<0.1		<0.1					<0.0001																							
γ-BHC (Lindane)	-	ug/L									<0.00031		<0.1		<0.1					<0.0001																							
γ-Chlordane	-	ug/L									<0.00042		<0.1		<0.1					<0.0001																							
Alachlor	0.005	mg/L									<0.00051		<0.0001		<0.0001					<0.0001																							
Atrazine	-	mg/L									<0.00051		<0.0001		<0.0001					<0.0001																							
Azinphos-Methyl (Guthion)	0.02	mg/L									<0.00038		<0.0001		<0.0001					<0.0001																							
Chlorpyriphos (Dursban)	0.09	mg/L									<0.00038		<0.0001		<0.0001					<0.0001																							
Cyanazine (Bladex)	0.01	mg/L									<0.00038		<0.0001		<0.0001					<0.0001																							
Desethyl Atrazine	-	mg/L									<0.00064		<0.0001		<0.0001					<0.0001																							
Diazinon	0.02	mg/L									<0.00038		<0.0002		<0.0001					<0.0001																							
Dimethoate	0.02	mg/L									<0.00038		<0.0001		<0.0001					<0.0001																							
Malathion	0.19	mg/L									<0.00038		<0.0001		<0.0001					<0.0001																							
Metolachlor	0.05	mg/L									<0.00026		<0.0001		<0.0001					<0.0001																							
Metribuzin (Sencor)	0.08	mg/L									<0.00026		<0.0001		<0.0001					<0.0001																							
Parathion	0.05	mg/L									<0.00026		<0.0001		<0.0001					<0.0001																							
Phorate	0.002	mg/L									<0.00038		<0.0001		<0.0001					<0.0001																							
Prometryne	0.001	mg/L									<0.00026		<0.0001		<0.0001					<0.0001																							
Simazine	0.01	mg/L									<0.00038		<0.0001		<0.0001					<0.0001																							
Terbufos	0.001	mg/L									<0.00026		<0.0002		<0.0002					<0.0002																							
Triallate	0.23	mg/L									<0.00026		<0.0001		<0.0001					<0.0001																							
Trifluralin	0.045	mg/L									<0.00026		<0.0001		<0.0001					<0.0001																							
Total PCBs	0.003	mg/L									<0.000052		<0.00002		<0.00002					<0.00001																							
2,4,5-T	0.28	ug/L									NT		<0.2		<0.2					<0.2																							
2,4-D	0.1	ug/L									NT		<0.2		<0.2					<0.2																							
Bromoxynil	0.005	ug/L									NT		<0.2		<0.2					<0.2																							
Dicamba	0.12	ug/L									NT		<0.2		<0.2					<0.2																							
Diclofop Methyl	0.009	ug/L									NT		<0.2		<0.2					<0.2																							
Dinoseb	0.01	ug/L									NT		<0.2		<0.2					<0.2																							
Picloram	0.19	ug/L									NT		<0.2		<0.2					<0.2																							
Atrazine + N-dealkylated metabolites	0.005	ug/L									NT		<0.2		<0.2					<0.2																							
Chlordane (total)	7	ug/L									NT		<0.3		<0.3					<0.3																							
Aldrin + Dieldrin	0.7	ug/L									NT		<0.04		<0.04					<0.04																							
Heptachlor + Heptachlor Epoxide	3	ug/L									NT		<0.02		<0.2					<0.2																							

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.6: Sampling Location - MW6-02
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event																																					
			2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Miscellaneous Parameters																																									
Nitrite (as N)	-	mg/L																		<0.02	<0.020	0.035	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT
Bicarbonate (HCO3)	-	mg/L																		278	218	222	270	190	193	189.8576	202.8646	213	213	211	199	187	189	198	219	196	245	184	198	196	270	NT
Carbonate (CO3)	-	mg/L																		<5	<5.0	<5.0	<5.0	<2	<2	NT	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Hydroxide (OH)	-	mg/L																		<5	<5.0	<5.0	<5.0	<2	<2	NT	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Cyanide	0.2	mg/L																		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0020	<0.0020	<0.0050	<0.0050
Ion Balance Calculation																																									
Cation - Anion Balance	-	%																		-2.1	9.1	6.4	NT	3.1	4	6.9	7.7	5.5	5.9	6.6	4.3	10.3	3.3	0.4	-3.6	1.6	-3.3	1.9	10.9	2	-1.36	-0.16
TDS (calculated)	-	mg/L																		309	307	318	304	NT	N	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	333	267	348	330
Anion Sum	-	me/L																		6.2	5.18	5.49	NT	5.36	5.43	5.29	5.68	6.21	6.09	6.04	5.78	5.37	5.4	5.37	6.02	5.48	6.56	4.98	5.27	4.77	7.1	6.06
Cation Sum	-	me/L																		5.94	6.21	6.3	NT	5.71	5.88	6.08	6.63	6.93	6.85	6.89	6.3	6.6	5.77	5.42	5.6	5.66	6.14	5.17	6.56	4.98	6.91	6.04
Inorganics																																									
Alkalinity	500	mg/L CaCO3	100	210	189	192	186	210	192	233	211	200	206	204	208	208	207	209	222	228	218	222	221	190	193	190	203	213	213	211	199	187	189	198	219	196	245	184	198	196	270	223
Ammonia	-	mg/L	0.73	ND	1.02	1.06	1.12	1.21	1.27	0.651	1.18	1.15	1.25	1.27	1.28	1.25	1.25	1.77	0.873	1.71	1.35	1.52	1.41	1.67	1.58	1.48	1.9	2.09	1.76	1.86	1.58	1.73	1.68	0.642	1.75	0.599	0.201	1.54	2.01	1.12	1.63	1.36
Arsenic	0.025	mg/L	0.003	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.00085	NT	0.00073	NT
Barium	1	mg/L	0.203	0.24	0.1	0.12	0.1	0.1	0.0958	0.12	0.123	0.135	0.121	0.198	0.13	0.372	0.15	0.182	0.15	0.175	0.157	0.17	0.169	0.173	0.169	0.189	0.199	0.209	0.187	0.173	0.162	0.17	0.124	0.118	0.14	0.137	0.0167	0.141	0.189	0.178	0.226	0.182
Boron	5	mg/L	NT	NT	<0.001	<0.001	<0.001	0.066	0.0833	0.0756	0.11	0.06	<0.05	0.094	0.113	0.141	0.099	0.09	<0.50	0.115	0.1	0.143	0.131	0.094	0.093	0.099	0.103	0.104	0.101	0.103	0.1	0.105	0.105	0.107	0.122	0.107	0.275	0.091	0.114	0.107	0.118	0.144
Cadmium	0.0001	mg/L	ND	ND	<0.0001	<0.0001	0.0001	0.0001	0.000012	<0.0001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0000050	NT	<0.0000050	NT
Calcium		mg/L	55.2	70	52.8	54.4	53.1	43.7	32.7	51.3	48.6	45.5	53.3	55.5	53.3	55.7	54.6	58.3	57.9	57	61.3	59.3	56.8	46.8	49.6	50.7	53.8	62.3	55.9	55.6	53.1	54.1	54.6	52.1	56.5	51.7	50.5	44.7	59.9	49.1	62.1	54.5
Chloride	250	mg/L	50	55.6	43.5	45.9	52.9	47	45	43.1	50.2	48.5	47	50.2	53.2	48.9	50.3	52.5	58.7	58.1	56.7	65.2	54.8	55.6	55.5	52.7	57.4	69	64.9	64.2	63.1	57.8	57.3	53.2	57.2	54.2	56.8	45.6	46.9	54	60.1	56.3
Chromium	0.05	mg/L	0.041	0.031	<0.001	<0.001	0.004	0.01	0.015	0.008	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	<0.0010	<0.001	<0.002	<0.001	<0.001	0.00074	<0.001	0.0007	0.00055	0.0006	0.00069	0.00133	0.00042	0.00024	<0.0005	0.00041	NT	0.00045	0.00063	NT	0.00056	NT
Conductivity	-	µS/cm	561	566	522	523	490	474	544	459	497	528	524	543	524	514	555	562	594	617	595	635	595	561	556	503	565	556	567	592	579	567	524	533	551	523	635	477	533	456	581	571
Copper	1	mg/L	0.046	0.039	<0.001	<0.001	<0.001	0.001	0.0016	0.0025	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NA	NT	0.00169	NT
Fluoride		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.024	0.039	<0.020	<0.020
Hardness		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	212	185	228	200
Iron	0.3	mg/L	25.2	52	0.5	0.9	22	4.15	5.99	6.61	25.6	25.9	22.5	0.524	1.36	0.374	<0.050	20.8	25	23.1	25.5	22.6	28	14.2	13.2	20	22.2	17.7	19.7	22.7	18.4	20.3	5.12	0.045	0.049	5.34	0.029	12.2	18.9	11.6	19.9	14.9
Lead	0.01	mg/L	0.034	0.016	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	0.02	0.016	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00009	<0.001	<0.0010	<0.00005	<0.0010	<0.00005	<0.00005	<0.00005	0.000286	0.000304	<0.000050	<0.00005	<0.00005	<0.00005	<0.000050	<0.000050	<0.000050	NT	0.00005	NT
Magnesium	-	mg/L	17	22	12.9	12.3	12	10.5	9.38	12.6	12.2	11.8	12.3	13.3	13.9	13.1	14.4	15.6	16.3	14.8	14.9	17.4	17	13	15.3	13.6	14	15.5	15.1	14.7	13.3	14.6	15	15.2	15.4	15.2	13.5	12.1	15.2	15.1	17.7	15.4
Manganese	0.05	mg/L	1.1	1.3	1.01	1.33	1.04	0.847	0.685	0.934	1	0.795	0.939	0.926	0.945	0.96	1.05	1.08	1.15	1.2	1.08	1.17	1.11	0.874	0.847	0.881	0.917	1.04	0.936	0.96	0.782	0.947	0.501	0.7	0.796	0.384	0.0208	0.926	1.07	0.716	1.22	0.781
Mercury	0.001	mg/L	ND	ND	<0.0001	<0.0001	0.0013	<0.0001	<0.0001	<0.0001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0000050	NT	<0.0000050	NT
Nitrate	10	mg/L	ND	0.1	<0.03	0.07	<0.03	<0.1	<0.1	<0.1	<0.03	<0.03	0.07	0.082	0.108	0.34	<0.030	0.271	0.155	0.054	0.047	0.037	0.256	0.11	0.161	0.061	0.083	0.179	0.086	<0.02	0.212	0.024	0.142	1.19	0.292	0.592	0.412	0.315	<0.020	0.072	0.056	0.232
Nitrite	1	mg/L	ND	ND	<0.02	0.21	0.44	<0.05	<0.03	<0.03	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.02	<0.02	0.035		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.014	NT	<0.010	NT
Organic Nitrogen		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.279	0.51	0.61	0.43
TKN	-	mg/L	2.5	0.8	2.03	1.71	1.96	1.68	1.32		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	2.29	1.63	NT	1.79
pH	6.5-8.5	mg/L	7.24	7.66	7.4	7.1	7	6.47	6.82	6.93	7.4	7.12	7.06	7.1	7.34	7.27	6.97	7.49	7	7.53	7.53	7.04	7.14	7.12	6.94	6.89	6.84	6.88	6.92	6.84	7.01	6.85	7	7.42	7.59	7.39	8.07	7.17	7.7	8.01	7.66	7.81
Total Phosphorous	-	mg/L	0.35	NT	NT	NT	NT	0.18	0.598	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.405	NT	0.232	NT
Potassium		mg/L	7.35	4.9	3.65	3.07	2.95	1.7	3.22	3.39	NT	NT	NT	NT	NT	NT	NT	NT	NT	3.3	3.39	3.54	3.3	3.96	NT	NT	NT	NT	NT	NT	4.6	4.78	5.19	5.71	5.49	30	4.39	5.88	NT	6.3	NT
Sodium	200	mg/L	29.8	34	34.4	32.3	33.1	6.11	41.1	39.4	40.2	35	41.2	38.2	40.3	39.8	37.9	34	42	38.4	40	39.2	38.8	29.6	29.7	28	30.6	32.5	34.1	32.6	32.6	30.6	29.4	31.3	30.7	30.8	39.7	26.4	25.8	26.9	30.3	29.2
Suspended Solids	-	mg/L	910	1200	40	42	342	2930	3290	496	770	370	320	516	254	570	783	2400	2620	1230	812	363	334	3120	887	2570	4030	1600	562	359	620	976	185	466	314	324	61	204	<0.30	83.3	582	297
TDS	500	mg/L	402	285	330	350	310	400	440	300	370	320	300	374	360	330	350	342	356	326	342	332	409	345	362	393	377	379	347	359	361	385	327	317	345	344	354	299	333	325	348	330
Sulfate	500	mg/L	ND	ND	0.5	2.5	2.4	<0.2	<1	<1	2.1	<0.3	<0.3	0.34	1.78	<0.30	<0.30	0.44	<0.30	<0.30	<0.30	0.32	<0.3	<0.3	<0.3	<0.30	<0.3	<0.30	<0.3	0.44	0.38	<0.30	<0.30	1.73	<0.30	<0.30	1.61	<0.30	<0.30	<0.30	<0.30	<0.30
Zinc	5	mg/L	0.264	0.11	0.15	0.035	0.008	0.003	0.0023	<0.0014	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0025	NT	0.0035	NT
Volatile Organics																																									
Benzene	5	µg/L	ND	NT	NT	NT	ND	<0.3	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
1,4 Dichlorobenzene	5	µg/L	ND	NT	NT	NT	ND	<0.3	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Dichloromethane	50	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<5.0	NT	<1.9	NT
Toluene	24	µg/L	ND	NT	NT	NT	NT	<0.3	<0.25	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.5	NT	<0.50	NT
Vinyl Chloride	2	µg/L	ND	NT	NT	NT	NT	<0.3	<0.2	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Other Organics																																									
BOD_5	-	mg/L	NT	ND	3	<2	<2	3	3.6	0.88	<2	<2	<2	<2	2.3	<2.0	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	3.9	<2	2.9	3.1	2.8	5.4	<2	2.3	3.5	<2.0	4.7	7.6	3	3.1	2.7	<2.0	6.7	<3.0	<3.0	<3.0
COD	-	mg/L	62	34.4	NT	38	53	20	41	42	37	41	42	35	102	36.8	34.2	49.2	22.8	32.5	34.8	35.6	44.5	57	49	41	35	52	41	45	43	99	79	96	64	83	79	45	59	39	69	36
DOC	5	mg/L	16.4	10.3	7	11	12	20	19.3	14.1	11	13	10	7.9	8.9	11.6	15.4	10.9	13.7	13.5	10.6	19.7	15.2	13.3	13.8	19.9	13.2	14	14	13.9	12.8	18.2	9.7	10.1	14.1	11.3	14.3	10.5	13.9	11.1	11.6	11.1
Phenol	-	mg/L	NT	0.001	0.004	0.004	0.003	0.004	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0014	NT	<0.0010	NT
Field Parameters																																									
pH	-										6.99	6.92	7.06	6.9	7.03	6.58	7.72	7.56	7.23	6.92	6.87	6.63	6.61	6.9	6.8	6.89	6.96	6.31	6.26	6.52	7.45	7.16	7.26	7.27	7.94	8.24	7.37	7.04	6.8	6.31	6.41	6.86
Conductivity	-	µS/cm									540	550	500	520	510	500	530	610	0.68	0.69	0.66	28.4	0.65	0.54	0.56	0.51	0.54	0.53	0.53	0.59	0.64	0.62	0.57	0.55	0.59	0.53	0.47	0.583	0.678	0.65	0.126	0.612
DO	-										66.8	71.8	18.9	50.9	17.7	12.8	43.6	35.9	27.5	21.6	34.7	0.67	38.5	15	29	5.2	26.8	29.5	22.1	38.9	25.6	16.2	21.4	37	17	21.4	15.7	24.2	14.8	17.3	66.7	39.7
Temp	-										10	9.9	9.2	10.7	8.6	8.2	8.9	6.8	10.5	7.7	10.2	8.9	11.6	5.6	9.6	5.8	10.5	8.8	11	7.3	8.4	7.6	7.5	5.8	9.3	8.7	8.6	10.6	7.1	10.1	9.5	9.2
Pesticides																																									
2,3,4,6-Tetrachlorophenol	0.1	mg/L					<0.0005		<0.000061		<0.0005		<0.0005							<0.0005																						
2,4,6-Trichlorophenol	0.005	mg/L					<0.0005		<0.000061		<0.0005		<0.0005							<0.0005																						
2,4-Dichlorophenol	0.9	mg/L					<0.0005		<0.000061		<0.0005		<0.0005							<0.0003																						
Pentachlorophenol	0.06	mg/L					<0.0005		<0.000061		<0.0005		<0.0005							<0.0005																						
Aldicarb	0.009	mg/L					<0.0009		<0.00085		<0.009		<0.001							<0.001																						
Bendiocarb	0.04	mg/L					<0.0002		<0.0022		<0.0002		<0.0002							<0.0002																						
Carbaryl	0.09	mg/L					<0.0002		<0.0022		<0.0002		<0.0002							<0.0002																						
Carbofuran	0.09	mg/L					<0.0002		<0.0022		<0.0002		<0.0002							<0.0002																						
Diuron	0.15	mg/L					<0.01		<0.011		<0.01		<0.01							<0.001																						
Temephos	0.28	mg/L					<0.0001		<0.024		<0.0001		<0.0001							<0.001																						
4,4'-DDD	-	ug/L					NT		<0.0008		<0.1		<0.1							<0.1																						
4,4'-DDE	-	ug/L					NT		<0.00027		<0.1		<0.01							<0.1																						
4,4'-DDT	-	ug/L					NT		<0.0004		<0.1		<0.1							<0.1																						
Aldrin	-	ug/L					NT		<0.0004		<0.02		<0.02							<0.02																						
Dieldrin	-	ug/L					NT		<0.0011		<0.02		<0.02							<0.02																						
Heptachlor	-	ug/L					NT		<0.00053		<0.1		<0.1							<0.1																						
Heptachlor epoxide	-	ug/L					NT		<0.00053		<0.1		<0.1							<0.1																						
Methoxychlor	0.9	ug/L					NT		<0.0011		<0.1		<0.1							<0.1																						
o,p-DDT	-	ug/L					NT		<0.00027		<0.1		<0.1							<0.1																						
Oxychlordane	-	ug/L					NT		NT		<0.1		<0.1							<0.1																						
α-Chlordane	-	ug/L					NT		<0.0004		<0.1		<0.1							<0.1																						
γ-BHC (Lindane)	-	ug/L					NT		<0.0004		<0.1		<0.1							<0.1																						
γ-Chlordane	-	ug/L					NT		<0.00053		<0.1		<0.1							<0.1																						
Alachlor	0.005	mg/L					<0.0001		<0.00088		<0.0001		<0.0001							<0.0001																						
Atrazine	-	mg/L					<0.0001		<0.00088		<0.0001		<0.0001							<0.0001																						
Azinphos-Methyl (Guthion)	0.02	mg/L					<0.0001		<0.00066		<0.0001		<0.0001							<0.0001																						
Chlorpyriphos (Dursban)	0.09	mg/L					<0.0001		<0.00066		<0.0001		<0.0001							<0.0001																						
Cyanazine (Bladex)	0.01	mg/L					<0.0001		<0.00066		<0.0001		<0.0001							<0.0001																						
Desethyl Atrazine	-	mg/L					<0.0001		<0.0011		<0.0001		<0.0001							<0.0001																						
Diazinon	0.02	mg/L					<0.0001		<0.00066		<0.0001		<0.0001							<0.0001																						
Dimethoate	0.02	mg/L					<0.0001		<0.00066		<0.0001		<0.0001							<0.0001																						
Malathion	0.19	mg/L					<0.0001		<0.00066		<0.0001		<0.0001							<0.0001																						
Metolachlor	0.05	mg/L					<0.0001		<0.00044		<0.0001		<0.0001							<0.0001																						
Metribuzin (Sencor)	0.08	mg/L					<0.0001		<0.00044		<0.0001		<0.0001							<0.0001																						
Parathion	0.05	mg/L					<0.01		<0.00044		<0.0001		<0.0001							<0.0001																						
Phorate	0.002	mg/L					<0.0001		<0.0005		<0.0001		<0.0001							<0.0001																						
Prometryne	0.001	mg/L					<0.0001		<0.00022		<0.0001		<0.0001							<0.0001																						
Simazine	0.01	mg/L					<0.0001		<0.0005		<0.0001		<0.0001							<0.0001																						
Terbufos	0.001	mg/L					<0.0002		<0.00044		<0.0002		<0.0002							<0.0002																						
Triallate	0.23	mg/L					<0.0001		<0.00044		<0.0001		<0.0001							<0.0001																						
Trifluralin	0.045	mg/L					<0.0001		<0.00044		<0.0001		<0.0001							<0.0001																						
Benzo(a)pyrene	0.00001	mg/L					0.00001		<0.00001		<0.00001		<0.00001							<0.00001																						
Total PCBs	0.003	mg/L					<0.00006		<0.00006		<0.0006		<0.00002							<0.000035																						
2,4,5-T	0.28	mg/L					<0.0002		<0.000093		<0.0002		<0.0002							<0.0002																						
2,4-D	0.1	mg/L					<0.0002		<0.00037		<0.0002		<0.0002							<0.0002																						
Bromoxynil	0.005	mg/L					<0.0002		<0.0005		<0.0002		<0.0002							<0.0002																						
Dicamba	0.12	mg/L					<0.0002		<0.00037		<0.0002		<0.0002							<0.0002																						
Diclofop Methyl	0.009	mg/L					<0.0002		<0.00037		<0.0002		<0.0002							<0.0002																						
Dinoseb	0.01	mg/L					<0.0002		<0.000093		<0.0002		<0.0002							<0.0002																						
Picloram	0.19	mg/L					<0.0002		<0.000093		<0.0002		<0.0002							<0.0002																						
Atrazine + N-dealkylated metabolites	0.005	mg/L					NT		<0.0009		NT		<0.0002							<0.0002																						
Chlordane (total)	7	ug/L					NT		<0.004		<0.3		<0.3							<0.3																						
Aldrin + Dieldrin	0.7	ug/L					<0.04		<0.004		<0.04		<0.04							<0.04																						

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.7: Sampling Location - MW1-03
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

| Parameter | ODWS | Units | Date of Sampling Event | | |

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.8: Sampling Location - MW2-03
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event										
			2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	2008 - 2015	2016 - 2023
Miscellaneous Parameters													
							Dry Well					Damaged Well	Well Decommissioned
Nitrite (as N)		mg/L											
Bicarbonate (HCO3)		mg/L											
Carbonate (CO3)		mg/L											
Hydroxide (OH)		mg/L											
Ion Balance Calculation													
Cation - Anion Balance		%											
TDS (calculated)		mg/L											
Anion Sum		me/L											
Cation Sum		me/L											
Inorganics													
Alkalinity	500	mg/L CaCO3	NT	12.6	NT	9		60	85	147	12		
Ammonia		mg/L	NT	ND	NT	<0.02		0.03	0.0979	0.182	0.04		
Arsenic	0.025	mg/L	NT	0.037	NT	<0.001		0.001	<0.001	<0.001	NT		
Barium	1	mg/L	NT	0.79	NT	0.08		0.027	0.104	0.0745	0.211		
Boron	5	mg/L	NT	0.028	NT	<0.05		0.01	0.0021	0.0044	0.09		
Cadmium	0.005	mg/L	NT	ND	NT	<0.0001		0.0001	0.00019	<0.0001	NT		
Calcium		mg/L	NT	33	NT	3.7		5	5.13	7.39	3.1		
Chloride	250	mg/L	NT	1.14	NT	1.7		1	0.84	0.63	1.5		
Chromium	0.05	mg/L	NT	0.13	NT	<0.001		0.005	0.0028	0.0027	NT		
Conductivity		µS/cm	NT	47.8	NT	45		47	41	33.5	45		
Copper	1	mg/L	NT	0.31	NT	0.002		0.009	0.0088	0.0156	NT		
Iron	0.3	mg/L	NT	120	NT	<0.05		3.65	0.306	0.708	1.01		
Lead	0.01	mg/L	NT	0.13	NT	<0.001		0.004	0.0028	0.0047	0.003		
Magnesium		mg/L	NT	21	NT	0.8		2.02	1.17	1.24	0.73		
Manganese	0.05	mg/L	NT	1.6	NT	0.019		0.058	0.0277	0.0641	0.025		
Mercury	0.001	mg/L	NT	ND	NT	<0.0001		<0.0001	<0.0001	<0.0001	NT		
Nitrate	10	mg/L	NT	0.4	NT	1.16		<0.1	<0.1	<0.1	0.13		
Nitrite	1	mg/L	NT	ND	NT	<0.02		<0.05	<0.03	<0.03	NT		
TKN		mg/L	NT	3.1	NT	0.28		0.24	0.35	NT	NT		
pH	6.5-8.5	mg/L	NT	6.51	NT	6		6.06	5.92	6.03	6.4		
Total Phosphorous		mg/L	NT	NT	NT	NT		0.18	3.77	NT	NT		
Potassium		mg/L	NT	9.8	NT	0.55		1.7	0.61	1.46	NT		
Sodium	200	mg/L	NT	NT	NT	3.43		6.11	5.35	2.92	3.74		
Suspended Solids		mg/L	NT	7900	NT	<2		870	26900	9700	2290		
TDS	500	mg/L	NT	140	NT	50		80	378	385	130		
Sulfate	500	mg/L	NT	2.6	NT	5.6		5	3.6	2.8	7.1		
Zinc	5	mg/L	NT	NT	NT	0.067		0.012	0.0048	0.009	NT		
Volatile Organics													
Benzene	5	µg/L	NT	NT	NT	NT		<0.3	<0.25		<0.5		
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	NT		<0.3	<0.25		<0.5		
Dichloromethane	50	µg/L	NT	NT	NT	NT		<0.3	<0.25		<0.5		
Toluene	24	µg/L	NT	NT	NT	NT		<0.3	<0.25		NT		
Vinyl Chloride	2	µg/L	NT	NT	NT	NT		<0.3	<0.2		<0.5		
Other Organics													
BOD_5		mg/L	NT	ND	<2	NT		0.8	1.4	0.66	<2		
COD		mg/L	NT	36.3	NT	7		<20	51	<20	25		
DOC	5	mg/L	NT	8.9	NT	4		2	3.3	3.5	27		
Phenol		mg/L	NT	0.002	NT	<0.002		0.001	<0.001	NT	NT		
Field Parameters													
pH											6.31		
Conductivity		µS/cm									0		
DO		%									82.6		
Temp		°									12.2		
Pesticides													
2,3,4,6-Tetrachlorophenol	0.1	mg/L							<0.00012				
2,4,6-Trichlorophenol	0.005	mg/L							<0.00012				
2,4-Dichlorophenol	0.9	mg/L							<0.00012				
Pentachlorophenol	0.06	mg/L							<0.00012				
Aldicarb	0.009	mg/L							<0.00087		<0.009		
Bendiocarb	0.04	mg/L							<0.0021				
Carbaryl	0.09	mg/L							<0.0021				
Carbofuran	0.09	mg/L							<0.0021				
Diuron	0.15	mg/L							<0.010		<0.01		
Temephos	0.28	mg/L							<0.024				
4,4'-DDD	-	ug/L							<0.001				
4,4'-DDE	-	ug/L							<0.00034				
4,4'-DDT	-	ug/L							<0.00051				
Aldrin	-	ug/L							<0.00051				
Dieldrin	-	ug/L							<0.0014				
Heptachlor	-	ug/L							<0.00068				
Heptachlor epoxide	-	ug/L							<0.00068				
Methoxychlor	0.9	ug/L							<0.0014				
o,p-DDT	-	ug/L							<0.00034				
Oxychlordane	-	ug/L							NT				
α-Chlordane	-	ug/L							<0.00051				
γ-BHC (Lindane)	-	ug/L							<0.00051				
γ-Chlordane	-	ug/L							<0.00068				
Alachlor	0.005	mg/L							<0.00092				
Atrazine	-	mg/L							<0.00092				
Azinphos-Methyl (Guthion)	0.02	mg/L							<0.00069				
Chlorpyriphos (Dursban)	0.09	mg/L							<0.00069				
Cyanzine (Bladex)	0.01	mg/L							<0.00069				
Desethyl Atrazine	-	mg/L							<0.0011				
Diazinon	0.02	mg/L							<0.00069				
Dimethoate	0.02	mg/L							<0.00069				
Malathion	0.19	mg/L							<0.00069				
Metolachlor	0.05	mg/L							<0.00046				
Metribuzin (Sencor)	0.08	mg/L							<0.00046				
Parathion	0.05	mg/L							<0.00046				
Phorate	0.002	mg/L							<0.00048				
Prometryne	0.001	mg/L							<0.00023				
Simazine	0.01	mg/L							<0.00048				
Terbufos	0.001	mg/L							<0.00046				
Triallate	0.23	mg/L							<0.00046				
Trifluralin	0.045	mg/L							<0.00046				
Benzo(a)pyrene	1E-05	mg/L							<0.00001				
Total PCBs	0.003	mg/L							<0.00008				
2,4,5-T	0.28	mg/L							<0.0001				
2,4-D	0.1	mg/L							<0.00042				
Bromoxynil	0.005	mg/L							<0.0005				
Dicamba	0.12	mg/L							<0.00042				
Diclofop Methyl	0.009	mg/L							<0.00042				
Dinoseb	0.01	mg/L							<0.0001				
Picloram	0.19	mg/L							<0.0001				
Atrazine + N-dealkylated metabolites	0.005	mg/L							<0.0009				
Chlordane (total)	7	ug/L							<0.004				
Aldrin + Dieldrin	0.7	ug/L							<0.004				

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.9: Sampling Location - MW3-03
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event																								
			2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	May-13	Oct-13	May-14	May-14	Oct-14	May-15	Oct-15	2016 - 2023
Miscellaneous Parameters																									DUP				Well Decommissioned
Nitrite (as N)		mg/L																		<0.02	<0.020	<0.020	<0.020	NT	NT	NT	NT	NT	
Bicarbonate (HCO3)		mg/L																		<5	<5.0	<5.0	<5.0	6	2.9	4.3	5.3	3.3	4.4
Carbonate (CO3)		mg/L																		<5	<5.0	<5.0	<5.0	<5.0	<2	<2	<2	NT	<2
Hydroxide (OH)		mg/L																		<5	<5.0	<5.0	<5.0	<5.0	<2	<2	<2	NT	<2
Ion Balance Calculation																													
Cation - Anion Balance		%																		Low EC	7.4	11.99	5.66	NT	9.2	7.3	15	0.9	7.4
TDS (calculated)		mg/L																		36.4	36.8	28	24.3	21.2	NT	NT	NT	NT	NT
Anion Sum		me/L																		0.54	0.57	0.43	0.39	NT	0.3	0.33	0.34	0.41	0.49
Cation Sum		me/L																		0.6	0.66	0.52	0.42	NT	0.36	0.38	0.46	0.42	0.57
Inorganics																													
Alkalinity	500	mg/L CaCO3	NT	NT	NT	<5	11	180	15	19	6	7	8	5.8	6.9	7.3	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2.9	4.3	5.3	3.3	4.4
Ammonia		mg/L	NT	NT	NT	<0.02	0.07	0.066	0.0459	0.141	0.03	0.02	0.05	<0.02	<0.02	0.02	<0.020	<0.020	0.028	0.06	<0.020	<0.02	0.024	0.189	<0.020	<0.020	0.023	0.066	0.024
Arsenic	0.025	mg/L	NT	NT	NT	<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Barium	1	mg/L	NT	NT	NT	0.09	0.01	0.08	0.0533	0.242	0.0325	0.04	0.028	0.091	0.083	0.02	0.021	0.016	0.045	0.017	0.017	<0.01	<0.01	0.00575	<0.010	<0.010	<0.010	0.00739	0.015
Boron	5	mg/L	NT	NT	NT	<0.05	<0.05	0.002	<0.002	0.0022	<0.05	<0.05	<0.05	<0.03	<0.05	<0.050	<0.050	<0.050	<0.050	<0.05	<0.050	<0.05	<0.05	<0.01	<0.05	<0.050	0.059	<0.010	<0.010
Cadmium	0.0001	mg/L	NT	NT	NT	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Calcium		mg/L	NT	NT	NT	6	5.3	4.7	3.1	4.06	3.7	2.3	3.9	2.51	3.4	2.99	3.92	2.43	8.64	3.25	3.16	2.21	1.26	1.35	1.71	1.82	1.94	2.52	3.82
Chloride	250	mg/L	NT	NT	NT	23.7	13.8	22.1	13.2	9.19	9.2	9.8	15	12.1	13.9	11.3	13.4	12.8	20.4	15.5	14.2	10.7	10	4.38	5.48	5.62	5.38	9.85	11.9
Chromium	0.05	mg/L	NT	NT	NT	<0.001	<0.001	0.002	0.0012	0.0014	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.001	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	0.00048	0.00045
Conductivity		µS/cm	NT	NT	NT	102	95	92	93.2	67.9	97	66	91	72.2	85.9	74.9	77.5	68.4	94.9	81.1	79.8	57.2	57.3	47.4	38.9	41.7	44.1	51.7	62.1
Copper	1	mg/L	NT	NT	NT	0.002	0.003	0.006	0.0044	0.0273	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Iron	0.3	mg/L	NT	NT	NT	<0.05	0.06	0.1	<0.02	0.278	0.019	0.077	0.051	0.156	0.81	<0.050	0.058	<0.050	0.151	<0.02	<0.020	0.067	<0.020	0.23	0.052	0.202	0.252	0.037	0.027
Lead	0.01	mg/L	NT	NT	NT	<0.001	0.001	<0.001	<0.001	0.0031	<0.001	<0.01	<0.01	0.014	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.000456	<0.001	<0.001	<0.0010	0.00009	<0.00005
Magnesium		mg/L	NT	NT	NT	1.34	1.29	0.947	0.665	0.72	0.86	0.52	0.77	0.556	0.74	0.57	0.78	30	3.92	0.626	0.646	0.588	0.33	0.328	0.456	0.419	0.379	0.509	0.658
Manganese	0.05	mg/L	NT	NT	NT	0.013	0.016	0.011	0.0057	0.0237	0.007	0.006	0.0072	0.0062	0.0094	0.0056	0.0099	0.0037	0.0417	0.0049	0.005	0.0051	0.0028	0.0115	0.004	0.0068	0.0065	0.00414	0.00523
Mercury	0.001	mg/L	NT	NT	NT	<0.0001	0.0025	<0.0001	<0.0001	<0.0001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Nitrate	10	mg/L	NT	NT	NT	0.23	0.14	<0.1	<0.1	<0.1	<0.03	<0.03	0.12	<0.03	0.082	<0.030	<0.030	<0.030	0.143	<0.03	0.154	0.043	0.033	<0.03	0.095	0.123	<0.030	0.034	0.037
Nitrite	1	mg/L	NT	NT	NT	<0.02	0.13	<0.05	<0.03	<0.03	NT	NT	NT	NT	NT	NT	NT	NT	NT		<0.020	<0.020	<0.020		NT	NT	NT	NT	NT
TKN		mg/L	NT	NT	NT	0.31	2.97	0.5	0.22		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
pH	6.5-8.5	mg/L	NT	NT	NT	5.9	6.3	5.38	5.53	5.48	6.1	5.9	5.86	6	5.88	6.07	5.55	5.57	5.68	5.46	6.02	5.54	5.56	5.62	5.59	5.77	5.72	5.69	5.56
Total Phosphorous		mg/L	NT	NT	NT	NT	NT	0.86	1.24	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Potassium		mg/L	NT	NT	NT	0.71	1.17	1.7	0.45	0.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	<0.50	<0.50	<0.50	0.149	<0.5	<0.5	NT	NT	NT
Sodium	200	mg/L	NT	NT	NT	10.6	11.2	6.11	10.45	9.1	12.6	9.12	12.5	9.51	10.7	8.71	10.5	7.82	20.2	9.82	10.4	8.21	7.47	7.44	4.69	4.49	5.94	5.12	6.86
Suspended Solids		mg/L	NT	NT	NT	6	36900	3250	5310	27600	675	1620	32500	829	999	756	19900	4160	841	1280	817	4270	4270	7970	2130	1200	11600	2720	162
TDS	500	mg/L	NT	NT	NT	50	180	100	130	160	110	80	240	98	100	64	92	<10	80	38	70	43	48	34	32	34	60	65	52
Sulfate	500	mg/L	NT	NT	NT	6.9	9.6	5.2	5.3	4.7	7.9	6.6	8	5.6	8.62	7.61	5.9	5.33	7.13	5	7.68	6.09	5.08	7.59	3.76	3.67	3.87	2.97	3.15
Zinc	5	mg/L	NT	NT	NT	0.106	0.008	0.004	0.0026	0.0062	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Volatile Organics																													
Benzene	5	µg/L	NT	NT	NT	NT	NT	<0.3	<0.25	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	NT	NT	<0.3	<0.25	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Dichloromethane	50	µg/L	NT	NT	NT	NT	NT	<0.3	<0.25	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Toluene	24	µg/L	NT	NT	NT	NT	NT	<0.3	<0.25	<0.25	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Vinyl Chloride	2	µg/L	NT	NT	NT	NT	NT	<0.3	<0.25	<0.25	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Other Organics																													
BOD_5		mg/L	NT	NT	NT	<2	<2	0.9	0.96	0.66	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	<2	<2	<2
COD	3	mg/L	NT	NT	NT	6	73	<20	<20	<20	3	<3	50	<3	6.9	20.5	30.3	14.5	22.9	17.6	25.2	34.7	29	140	45	27	49	62	<10
DOC	5	mg/L	NT	NT	NT	3	8	4	1.7	3.5	13	5	2	4	2.6	3.6	5.3	3.4	2.8	2.6	3.2	11	11.9	6.7	4.7	4.8	5	3.8	10.7
Phenol		mg/L	NT	NT	NT	<0.002	0.006	0.003	<0.001	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Field Parameters																													
pH											5.84	6.23	6.58	7.12	6.95	6.35	7.19	6.24	6.07	6.2	7.07	6.1	6.1	6.97	8.61		7.75	8.13	6.71
Conductivity		µS/cm									50	20	50	20	40	40	40	40	0.07	0.04	0.06	0	0	0.01	0		0	0	0.03
DO		%									89.5	58.3	74.2	81.5	65.7	86	44.6	33.7	64.4	80.6	77.5	57.8	57.8	54.6	55		62.5	59.7	53
Temp		°									12.9	9.4	12	10	12.1	11.2	14.5	8.2	14.5	8.8	13.1	7.2	7.2	13.5	6.4		12.7	6.7	13.3
Pesticides																													
2,3,4,6-Tetrachlorophenol	0.1	mg/L																		<0.0005									
2,4,6-Trichlorophenol	0.005	mg/L					<0.0005	<0.001		<0.00051		<0.0005		<0.0005						<0.0005									
2,4-Dichlorophenol	0.9	mg/L					<0.0005	<0.001		<0.00051		<0.0005		<0.0005						<0.0003									
Pentachlorophenol	0.06	mg/L					<0.0005	<0.001		<0.00051		<0.0005		<0.0005						<0.0005									
Aldicarb	0.009	mg/L					<0.0009	<0.0007		<0.00051		<0.009		<0.001						<0.001									
Bendiocarb	0.04	mg/L					<0.0002	<0.001		<0.001		<0.0002		<0.0002						<0.0002									
Carbaryl	0.09	mg/L					<0.0002	<0.001		<0.001		<0.0002		<0.0002						<0.0002									
Carbofuran	0.09	mg/L					<0.0002	<0.001		<0.001		<0.0002		<0.0002						<0.0002									
Diuron	0.15	mg/L					<0.01	<0.007		<0.0051		<0.007		<0.001						<0.001									
Temephos	0.28	mg/L					<0.0001	<0.02		<0.014		<0.0001		<0.0001						<0.0001									
4,4'-DDD	-	ug/L					NT	<0.002		<0.0009		<0.1		<0.1						<0.1									
4,4'-DDE	-	ug/L					NT	<0.0005		<0.0003		<0.1		<0.1						<0.1									
4,4'-DDT	-	ug/L					NT	<0.0008		<0.00045		<0.1		<0.1						<0.1									
Aldrin	-	ug/L					NT	<0.0008		<0.00045		<0.02		<0.02						<0.02									
Dieldrin	-	ug/L					NT	<0.002		<0.0012		<0.02		<0.02						<0.02									
Heptachlor	-	ug/L					NT	<0.001		<0.0006		<0.1		<0.1						<0.1									
Heptachlor epoxide	-	ug/L					NT	<0.001		<0.0006		<0.1		<0.1						<0.1									
Methoxychlor	0.9	ug/L					NT	<0.002		<0.0012		<0.1		<0.1						<0.1									
o,p-DDT	-	ug/L					NT	<0.0005		<0.0003		<0.1		<0.1						<0.1									
Oxychlordane	-	ug/L					NT	<0.001		<0.00075		<0.1		<0.1						<0.1									
α-Chlordane	-	ug/L					NT	<0.0008		<0.00045		<0.1		<0.1						<0.1									
γ-BHC (Lindane)	-	ug/L					NT	<0.0008		<0.00045		<0.1		<0.1						<0.1									
γ-Chlordane	-	ug/L					NT	<0.001		<0.0006		<0.1		<0.1						<0.1									
Alachlor	0.005	mg/L					<0.0001	<0.0004		<0.00056		<0.0001		<0.0001						<0.0001									
Atrazine	-	mg/L					<0.0001	<0.0004		<0.00056		<0.0001		<0.0001						<0.0001									
Azinphos-Methyl (Guthion)	0.02	mg/L					<0.0001	<0.0003		<0.00042		<0.0001		<0.0001						<0.0001									
Chlorpyriphos (Dursban)	0.09	mg/L					<0.0001	<0.0003		<0.00042		<0.0001		<0.0001						<0.0001									
Cyanzine (Bladex)	0.01	mg/L					<0.0001	<0.0003		<0.00042		<0.0001		<0.0001						<0.0001									
Desethyl Atrazine	-	mg/L					<0.0001	<0.0005		<0.0007		<0.0001		<0.0001						<0.0001									
Diazinon	0.02	mg/L					<0.0001	<0.0003		<0.00042		<0.0001		<0.0001						<0.0001									
Dimethoate	0.02	mg/L					<0.0001	<0.0003		<0.00042		<0.0001		<0.0001						<0.0001									
Malathion	0.19	mg/L					<0.0001	<0.0003		<0.00042		<0.0001		<0.0001						<0.0001									
Metolachlor	0.05	mg/L					<0.0001	<0.0002		<0.00028		<0.0001		<0.0001						<0.0001									
Metribuzin (Sencor)	0.08	mg/L					<0.0001	<0.0002		<0.00028		<0.0001		<0.0001						<0.0001									
Parathion	0.05	mg/L					<0.01	<0.0002		<0.00028		<0.0001		<0.0001						<0.0001									
Phorate	0.002	mg/L					<0.0001	<0.0003		<0.00042		<0.0001		<0.0001						<0.0001									
Prometryne	0.001	mg/L					<0.0001	<0.0002		<0.00028		<0.0001		<0.0001						<0.0001									
Simazine	0.01	mg/L					<0.0001	<0.0003		<0.00042		<0.0001		<0.0001						<0.0001									
Terbufos	0.001	mg/L					<0.0002	<0.0002		<0.00028		<0.0002		<0.0002						<0.0002									
Triallate	0.23	mg/L					<0.0001	<0.0002		<0.00028		<0.0001		<0.0001						<0.0001									
Trifluralin	0.045	mg/L					<0.0001	<0.0002		<0.00028		<0.0001		<0.0001						<0.0001									
Benzo(a)pyrene	0.00001	mg/L																		<0.00001									
Total PCBs	0.003	mg/L					<0.00006	<0.0002		<0.075		<0.0002		<0.00002						<0.000035									
2,4,5-T	0.28	mg/L					<0.0002	<0.00008		<0.000067		<0.0002		<0.0002						<0.0002									
2,4-D	0.1	mg/L					<0.0002	<0.0003		<0.00027		<0.0002		<0.0002						<0.0002									
Bromoxynil	0.005	mg/L					<0.0002	<0.0008		<0.00067		<0.0002		<0.0002						<0.0002									
Dicamba	0.12	mg/L					<0.0002	<0.0003		<0.00027		<0.0002		<0.0002						<0.0002									
Diclofop Methyl	0.009	mg/L					<0.0002	<0.0003		<0.00027		<0.0002		<0.0002						<0.0002									
Dinoseb	0.01	mg/L					<0.0002	<0.00008		<0.000067		<0.0002		<0.0002						<0.0002									
Picloram	0.19	mg/L					<0.0002	<0.00008		<0.000067		<0.0002		<0.0002						<0.0002									
Atrazine + N-dealkylated metabolites	0.005	mg/L					NT	<0.0009				<0.0002		<0.0002						<0.0002									
Chlordane (total)	7	ug/L					NT	<0.004				<0.3		<0.3						<0.3									
Aldrin + Dieldrin	0.7	ug/L					<0.04	<0.004				<0.04		<0.04						<0.04									
Heptachlor + Heptachlor Epoxide	3	ug/L					<0.2	<0.004						<0.2						<0.2									

Shaded concentrations exceed ODWS
ND = Not Detected
NT = Not Tested

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.10: Sampling Location - MW1-15
MECP Landfill Standards Guideline: Schedule 5 Parameters, Column 2
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event															
			Jun-16	Oct-16	May-17	Nov-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Miscellaneous Parameters																		
			Well Constructed				Duplicate											
Nitrite (as N)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.100	NT
Bicarbonate (HCO3)	-	mg/L	794	874	858	817	855	824	858	814	893	881	829	879	827	820	834	NT
Carbonate (CO3)	-	mg/L	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Hydroxide (OH)	-	mg/L	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Cyanide	0.2	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0020	<0.0020	<0.0050	<0.0050
Ion Balance Calculation																		
Cation - Anion Balance	-	%	5.9	3.3	-0.4	-0.3	-1.8	1.8	3	2.3	1.8	2.1	0.9	-2.8	-4.6	9	4.28	2.78
TDS (calculated)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	Jul-02	1000	Oct-02
Anion Sum	-	me/L	18.5	20	19.6	18.7	19.6	2.31	19.6	18.6	20.2	19.8	18.8	19.7	18.4	15.8	19	19.2
Cation Sum	-	me/L	20.8	21.4	19.4	18.6	18.9	18.9	20.8	19.5	21	20.6	19.1	18.7	16.8	19	20.7	20.3
Inorganics																		
Alkalinity	500	mg/L CaCO3	794	874	858	817	855	824	858	814	893	881	829	879	827	820	834	850
Ammonia	-	mg/L	1.39	0.417	0.33	0.317	0.195	0.243	0.266	0.198	0.171	0.315	0.349	0.692	0.479	1.33	0.678	0.842
Arsenic	0.025	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0097	NT	0.0137	NT
Barium	1	mg/L	0.23	0.218	0.178	0.17	0.177	0.184	0.179	0.16	0.189	0.184	0.163	0.193	0.158	0.208	0.175	0.212
Boron	5	mg/L	0.97	0.995	0.919	0.927	0.935	0.989	1.33	1.17	1.24	1.36	1.38	1.42	1.06	1.34	1.55	1.41
Cadmium	0.0001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.000050	NT	<0.0000500	NT
Calcium	-	mg/L	219	217	199	195	192	200	210	198	205	203	194	186	174	191	205	198
Chloride	250	mg/L	87	88.7	84.3	83.3	87.8	84.3	85.4	80.7	84.2	76.4	80.2	77.7	66.9	83.3	82.6	76.8
Chromium	0.05	mg/L	0.00048	0.00045	0.00041	0.00056	0.00074	0.0003	0.00059	0.0004	<0.0005	0.00056	<0.0050	0.00059	<0.0050	NT	<0.00500	NT
Conductivity	-	µS/cm	1480	1600	1630	1640	1660	1670	1620	1540	1600	1640	1640	1640	1610	1360	1570	1620
Copper	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NA	NT	<0.00200	NT
Fluoride		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.02	<0.10	<0.200	<0.400
Hardness		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	704	817	854	Apr-02
Iron	0.3	mg/L	7.67	7.24	6.43	6.62	6.68	6.88	8.46	0.697	9.19	10.1	10.2	9.43	7.51	10.8	12.5	12.3
Lead	0.01	mg/L	<0.00005	<0.00005	<0.00005	0.000215	0.000066	0.000057	<0.000050	<0.00005	<0.0005	0.000096	0.00006	0.000051	<0.00050	NT	<0.000500	NT
Magnesium	-	mg/L	81.8	89.1	78.8	72.2	76.6	80.9	84.5	82.6	87.3	84.5	74.4	74.4	65.7	82.5	83.1	81.9
Manganese	0.05	mg/L	4.01	4.55	3.95	3.97	4.12	3.86	4.55	3.74	4.47	3.91	4.16	3.49	2.83	3.75	4.68	4.24
Mercury	0.001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0000050	NT	0.0000062	NT
Nitrate	10	mg/L	<0.040	<0.040	<0.040	<0.040	<0.020	<0.020	<0.020	0.196	<0.10	<0.040	<0.20	<0.10	<0.020	<0.10	<0.200	<0.400
Nitrite	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.027	NT	<0.100	NT
Organic Nitrogen		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	2.96	1.78	0.972	1.36
TKN	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	3.44	3.09	NT	2.20
pH	6.5-8.5	mg/L	6.66	6.74	6.65	6.83	6.81	6.7	6.74	6.93	6.86	7.09	6.81	6.86	7.14	7.45	7.14	7.12
Total Phosphorous	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.61	NT	0.486	NT
Potassium	-	mg/L	3.83	4.03	NT	NT	NT	3.51	4.07	3.98	3.79	4.16	3.74	4.36	3.59	NT	4.24	NT
Sodium	200	mg/L	57.4	59.8	55.7	53.9	55.5	53.6	60.4	58.7	64.4	63.4	58.2	57.3	49.1	58.4	65.2	63.9
Suspended Solids	-	mg/L	42700	12100	14300	16600	8620	2720	8370	1840	2020	1350	990	7060	0.66	1520	1620	2000
TDS	500	mg/L	1010	988	1200	892	1190	1030	878	945	989	979	949	1010	1050	949	1000	1010
Sulfate	500	mg/L	7.56	3.18	2.22	1.86	1.71	2.31	1.01	2.52	<1.5	0.69	<3.0	<1.5	0.66	<1.5	<3.00	<6.00
Zinc	5	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010		<0.0100	NT
Volatile Organics																		
Benzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	Jan-00	NT	0.65	NT
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Dichloromethane	50	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<5.0	NT	<2.0	NT
Toluene	24	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Vinyl Chloride	2	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Other Organics																		
BOD_5	-	mg/L	5.7	3.5	5.2	2.6	2.8	<2.0	<2.0	<2.0	3.6	3.2	4.4	5.5	<2.0	3.2	<3.0	4.6
COD	-	mg/L	74	270	46	153	98	187	133	271	104	105	110	81	153	98	98	53
DOC	5	mg/L	10.3	16.3	17.8	19.5	18.2	34.3	20.5	15.7	18.1	30.4	27	26.2	23.1	23.7	17.6	18.2
Phenol	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	Jan-00	NT	<0.0010	NT
Field Parameters																		
pH	-		6.4	6.17	6.68	6.74		6.6	6.61	7.32	6.46	7.14	5.88	6.43	6.52	6.49	5.92	6.5
Conductivity	-	µS/cm	1.37	1.26	1.22	1.73		1.58	1.57	1.52	1.47	1.51	1.14	1.676	1.78	1.639	1.523	1.454
DO	-	%	14.1	15.3	9.4	20.2		11.3	20.1	11.4	12.2	16	17.3	15.2	13.4	19.4	16.6	33.2
Temp	-	°	9.8	11.9	10	10.2		10.6	9.9	9	10.3	10.3	11	11.3	10.1	11.8	10	11

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.11: Sampling Location - MW2-15
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event													
			Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Miscellaneous Parameters																	
			Well Constructed												DRY		DRY
Nitrite (as N)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		<0.010	
Bicarbonate (HCO3)	-	mg/L	25.1	13.3	10.8	15.7	11	14.4	10.8	11.2	15.1	11.8	13.1	9.8		7.6	
Carbonate (CO3)	-	mg/L	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		<2.0	
Hydroxide (OH)	-	mg/L	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		<2.0	
Cyanide	0.2	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0020		<0.0050	
Ion Balance Calculation																	
Cation - Anion Balance	-	%	-13.3	2.7	0.9	1.5	3.5	-6	-5.9	-2.9	2.2	-3.1	3.3	1.6		4.35	
TDS (calculated)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		33	
Anion Sum	-	me/L	0.87	0.63	0.35	0.42	0.3	0.48	0.36	0.27	0.35	0.29	0.32	0.3		0.22	
Cation Sum	-	me/L	0.67	0.67	0.36	0.43	0.32	0.43	0.32	0.26	0.37	0.27	0.34	0.31		0.24	
Inorganics																	
Alkalinity	500	mg/L CaCO3	25.1	13.3	10.8	15.7	11	14.4	10.8	11.2	15.1	11.8	13.1	9.8		7.6	
Ammonia	-	mg/L	2.31	0.048	0.048	<0.020	0.05	0.061	<0.020	<0.010	<0.005	0.0063	0.0066	0.02		<0.0500	
Arsenic	0.025	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.00012		<0.00010	
Barium	1	mg/L	0.000145	0.000379	0.000975	0.00357	0.0031	0.00165	0.00251	0.0042	0.00519	0.00496	0.00445	0.00756		0.016	
Boron	5	mg/L	<0.010	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010		<0.010	
Cadmium	0.0001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	9.4E-06		<0.0000050	
Calcium	-	mg/L	0.269	0.205	1.61	3.39	3.07	1.87	3.38	2.49	3.74	2.83	3.01	3.39		2.46	
Chloride	250	mg/L	0.74	0.8	0.94	0.57	0.43	1	1.73	<0.50	0.43	0.48	0.27	1.24		<0.50	
Chromium	0.05	mg/L	0.00045	0.00026	0.00019	0.00031	0.00102	0.00037	0.00021	<0.0005	0.00032	NT	0.00035	<0.00050		<0.00050	
Conductivity	-	µS/cm	66.7	71.2	36.2	42.3	35.3	50.1	62.5	30.1	35.6	35.1	32.1	36		25	
Copper	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		0.00258	
Fluoride	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.02		<0.020	
Hardness	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	10.6		7.6	
Iron	0.3	mg/L	0.134	0.066	0.033	0.09	0.078	0.101	0.027	0.05	0.095	0.051	0.089	0.081		0.018	
Lead	0.01	mg/L	0.000328	0.000375	0.000055	0.00008	0.000698	0.000168	<0.00005	0.000101	0.000092	<0.000050	0.000102	0.000103		<0.000050	
Magnesium	-	mg/L	0.0119	0.0336	0.281	0.821	0.471	0.275	0.515	0.376	0.562	0.394	0.43	0.505		0.354	
Manganese	0.05	mg/L	0.0041	0.00512	0.0197	0.0377	0.0102	0.00721	0.00694	0.00505	0.0119	0.00635	0.00792	0.00517		0.00184	
Mercury	0.001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0000050		<0.0000050	
Nitrate	10	mg/L	0.089	0.092	0.083	0.092	0.064	0.171	0.277	0.054	0.108	0.106	<0.020	0.516		<0.020	
Nitrite	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010		<0.010	
Organic Nitrogen	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.587		0.379	
TKN	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.607		NT	
pH	6.5-8.5	mg/L	6.24	6.19	5.93	5.94	5.69	6.24	5.78	5.93	6.18	5.82	5.99	6.1		6.54	
Total Phosphorous	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.268		0.219	
Potassium	-	mg/L	0.058	0.157	NT	NT	0.291	0.383	0.271	0.319	0.328	0.27	0.42	0.335		0.258	
Sodium	200	mg/L	14.7	14.7	5.58	4.01	2.34	6.47	2.11	1.92	2.55	1.8	2.94	1.78		1.67	
Suspended Solids	-	mg/L	12500	2050	3480	2500	2130	3160	383	1190	1060	1510	1840	1.77		506	
TDS	500	mg/L	80	66	172	50	32	58	28	33	35	36	50	37		33	
Sulfate	500	mg/L	16.6	16.2	5.08	3.99	3.03	7.3	3.58	2.13	0	1.5	2.33	1.77		3.18	
Zinc	5	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0022		0.0038	
Volatile Organics																	
Benzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50		<0.50	
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50		<0.50	
Dichloromethane	50	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<5.0		<1.9	
Toluene	24	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50		<0.50	
Vinyl Chloride	2	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50		<0.50	
Other Organics																	
BOD_5	-	mg/L	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		<2.0	
COD	-	mg/L	191	38	41	55	92	75	54	91	42	47	22	53		46	
DOC	5	mg/L	10.7	5.8	3.7	3.3	8.9	6.2	2.33	4.2	3.41	3.53	3.33	2.93		2.78	
Phenol	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.001		0.002	
Field Parameters																	
pH	-		6.2	7.56	6.42	7.57	7.79	8.62	8.77	8.02	8.57	7.63	6.46	7.01		7.36	
Conductivity	-	µS/cm	0	0.06	0	0.05	0.03	N/A	0.05	0.03	0.04	0.04	0.119	0.045		0.092	
DO	-	%	64.7	93.4	89.4	68.6	56.8	87.6	65.6	56.6	58.4	44.5	68.8	78.1		82	
Temp	-	°	11.7	14.6	6.2	6.9	11.4	6.9	3.9	13.1	8.5	11.9	14.7	10.6		13.7	

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.12: Sampling Location - MW3-15
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event														
			Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	14-Jun-23	Oct-23
Miscellaneous Parameters																	
			Well Constructed in														
Nitrite (as N)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT
Bicarbonate (HCO3)	-	mg/L	70.8	43	29.6	43.5	28.1	23.7	16.1	17.6	19.3	18.9	15	23	14.4	17	NT
Carbonate (CO3)	-	mg/L	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Hydroxide (OH)	-	mg/L	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Cyanide	0.2	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0020	<0.0020	<0.0050	<0.0050
Ion Balance Calculation																	
Cation - Anion Balance	-	%	-16.7	-19.3	-7.4	14.1	16.3	6.6	14.7	-0.6	10.1	-3.7	2.6	2.2	Low EC	5.56	-2.86
TDS (calculated)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	May-00	Jan-00	94	75
Anion Sum	-	me/L	1.74	1.23	0.98	1.16	1.01	0.87	0.59	0.69	0.72	0.68	0.58	0.73	0.49	0.68	0.54
Cation Sum	-	me/L	1.24	0.83	0.84	1.54	1.41	0.99	0.8	0.69	0.88	0.63	0.62	0.76	0.54	0.76	0.51
Inorganics																	
Alkalinity	500	mg/L CaCO3	70.8	43	29.6	43.5	28.1	23.7	16.1	17.6	19.3	18.9	15	23	14.4	17	13.7
Ammonia	-	mg/L	0.2	0.16	0.263	0.218	0.371	0.254	0.237	0.012	0.0096	0.0101	0.0058	0.018	<0.010	<0.0500	0.0069
Arsenic	0.025	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.00027	NT	0.00016	NT
Barium	1	mg/L	0.00671	0.00616	0.00516	0.0101	0.0103	0.00644	0.00289	0.00276	0.00729	0.00611	0.00564	0.00618	0.0162	0.00595	0.0051
Boron	5	mg/L	0.373	0.155	0.427	0.556	0.307	0.384	0.268	0.115	0.255	0.131	0.121	0.193	0.081	0.199	0.123
Cadmium	0.0001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	9.5E-06	NT	7.4E-06	NT
Calcium	-	mg/L	4.33	4.08	4.47	6.26	4.01	4.77	3.92	4.01	3.8	3.23	3.13	3.55	3.22	3.14	2.88
Chloride	250	mg/L	9.38	8.05	9.58	7.46	12.7	10.6	6.61	9.01	9.21	7.19	6.12	6.19	4.95	6.8	5.08
Chromium	0.05	mg/L	0.00147	0.00053	0.00125	0.00278	0.00403	0.00113	0.00094	0.00056	0.00106	NT	0.00042	0.00067	NT	0.00052	NT
Conductivity	-	µS/cm	129	112	97.9	117	109	85.2	67.7	75.9	76.7	77	65.4	73.4	55.9	72.8	61.4
Copper	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NA	NT	0.00502	NT
Fluoride		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.03	0.046	<0.020	<0.020
Hardness		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	13.7	12.3	12.7	10.9
Iron	0.3	mg/L	1.46	0.762	1.4	5.82	5.98	1.4	0.762	0.486	1.81	0.946	0.863	2.02	0.409	2.5	0.398
Lead	0.01	mg/L	0.00122	0.000596	0.00139	0.00199	0.00316	0.000808	0.000148	0.000163	0.000387	0.000289	0.00018	0.000285	NT	0.000161	NT
Magnesium	-	mg/L	0.932	0.983	0.995	1.78	1.24	1.53	1.28	1.18	1.39	0.989	0.998	1.18	1.03	1.19	0.91
Manganese	0.05	mg/L	0.582	0.532	0.795	1.37	1	0.954	0.668	0.605	0.881	0.427	0.356	0.642	0.23	0.83	0.236
Mercury	0.001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	7.3E-06	NT	5.3E-06	NT
Nitrate	10	mg/L	0.021	0.028	0.053	0.025	0.034	0.057	0.06	0.077	0.047	0.25	0.076	0.03	0.048	0.028	0.048
Nitrite	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT	<0.010	NT
Organic Nitrogen		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.485	0.266	0.377	0.511
TKN	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.503	0.266	NT	0.518
pH	6.5-8.5	mg/L	6.58	6.46	6.34	6.55	6.37	6.38	6.61	6.5	6.58	6.48	6.12	6.4	6.78	6.8	6.61
Total Phosphorous	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.477	NT	0.25	NT
Potassium	-	mg/L	0.508	0.561	0.297	0.542	0.358	0.506	0.354	0.378	0.468	0.339	0.456	0.362	NT	0.341	NT
Sodium	200	mg/L	18.8	10.5	9.31	15.5	14.6	10.8	9.11	7.49	9.69	7.05	6.88	7.72	6.53	8.44	5.85
Suspended Solids	-	mg/L	16400	3820	2400	12500	9430	3900	3280	1420	1200	2370	3840	4.27	691	736	1430
TDS	500	mg/L	685	354	302	229	319	155	155	182	127	141	198	123	129	94	75
Sulfate	500	mg/L	2.83	6.97	5.47	3.89	4.48	4.26	3.88	4.01	3.3	4.06	5.12	4.27	5.15	6.82	5.7
Zinc	5	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0097	NT	0.0036	NT
Volatile Organics																	
Benzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Dichloromethane	50	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<5.0	NT	<1.9	NT
Toluene	24	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Vinyl Chloride	2	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Other Organics																	
BOD_5	-	mg/L	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.0	<2.0	<3.0	<3.0	<3.0
COD	-	mg/L	117	31	60	132	129	275	159	77	55	95	31	64	27	10	50
DOC	5	mg/L	12.5	5.4	14	22.9	18.9	12.8	8.07	10.3	8.19	4.63	4.44	5.88	2.72	3.85	3.32
Phenol	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0012	NT	0.0024	NT
Field Parameters																	
pH	-		6.34	6.42	7.11	6.89	7.43	7.89	8.03	9.08	8.92	7.91	6.29	6.7	5.3	6.15	6.36
Conductivity	-	µS/cm	0.13	0.08	0.08	0.15	0.14	0.1	0.11	0.09	0.08	0.07	0.076	0.104	0.088	0.109	0.116
DO	-	%	26.7	23.8	21.8	43.8	27.6	52.5	45.6	22.5	33.3	27	31.1	24.4	39.2	32.4	43.8
Temp	-	°	9.4	13.2	7.1	11.2	7.7	8.3	6.3	11	9.9	11	13	7.5	12.7	10.1	10.9

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.13: Sampling Location - MW4-15
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event																		
			Jun-16	Oct-16	May-17	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	Nov-20	May-21	May-21	Oct-21	Oct-21	May-22	Sep-22	14-Jun-23	Oct-23
Miscellaneous Parameters						Duplicate							Duplicate		Duplicate		Duplicate				
			Well Constructed																		
Nitrite (as N)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT
Bicarbonate (HCO3)	-	mg/L	44.7	48.2	40.7	40.7	39.1	35.7	40.4	38.8	39.1	35.3	36.6	35.2	36.6	49.6	47.5	37	44.3	46.1	NT
Carbonate (CO3)	-	mg/L	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Hydroxide (OH)	-	mg/L	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Cyanide'	0.2	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0020	<0.0020	<0.0050	<0.0050
Ion Balance Calculation																					
Cation - Anion Balance	-	%	-1.5	12.1	0.5	-0.7	-4.7	-0.2	10.1	4.5	-1.6	-0.2	-2.1	-2.8	-5.9	8.6	10	-1.4	10	6.31	8.18
TDS (calculated)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	Mar-00	Feb-00	73	98.00
Anion Sum	-	me/L	1.18	1.17	1.02	1.03	0.98	0.91	1.01	0.93	0.96	0.85	0.87	0.85	0.89	1.13	1.09	0.88	0.87	1.04	1.46
Cation Sum	-	me/L	1.15	1.49	1.03	1.02	0.89	0.91	1.24	1.02	0.93	0.85	0.84	0.8	0.79	1.35	1.33	0.85	1.06	1.18	1.72
Inorganics																					
Alkalinity	500	mg/L CaCO3	44.7	48.2	40.7	40.7	39.1	35.7	40.4	38.8	39.1	35.3	36.6	35.2	36.6	49.6	47.5	37	44.3	46.1	66
Ammonia	-	mg/L	0.78	0.476	0.44	0.442	0.663	0.343	0.84	0.497	0.141	0.11	0.0912	0.082	0.134	0.632	0.644	0.068	0.521	0.132	0.684
Arsenic	0.025	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	Jan-00	NT	0.00192	NT
Barium	1	mg/L	0.00959	0.0121	0.00831	0.00846	0.00773	0.00653	0.00908	0.00936	0.00675	0.00631	0.00948	0.00602	0.00579	0.0105	0.0102	0.00712	0.0156	0.0076	0.0125
Boron	5	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.01	0.01	0.028
Cadmium	0.0001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0000050	NT	0.0000086	NT
Calcium	-	mg/L	10.7	11.2	9.75	9.72	8.99	9.26	9.58	9.55	9.26	8.29	8.26	8.09	8.04	9.49	9.42	8.64	10.4	10.6	12.8
Chloride	250	mg/L	1.15	1.7	1.28	1.27	1.05	1.15	2.32	1.43	1.37	1.09	1	1.05	1.14	1.24	1.25	0.84	1.4	0.93	1.97
Chromium	0.05	mg/L	0.00022	0.00018	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001	<0.0005	0.0003	0.00038		0.00021	0.00037	0.00032	<0.00050	NT	<0.00050	NT
Conductivity	-	µS/cm	103	108	98.2	98.7	95.2	93.8	97.9	99.2	90.3	81.5	83.4	82.8	85.8	108	103	81.4	94.6	96	139
Copper	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NA	NT	0.00284	NT
Fluoride		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.024	Jan-00	<0.020	<0.020
Hardness		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	32.4	Feb-00	42.9	54.7
Iron	0.3	mg/L	2.86	6.9	1.26	1.09	0.908	0.334	4.38	0.453	0.291	0.451	0.481	0.459	0.418	5.61	5.35	0.591	6.09	1.86	9.83
Lead	0.01	mg/L	0.00033	0.000096	<0.00005	<0.00005	<0.00005	<0.000050	<0.000050	<0.00005	<0.00005	<0.00005	<0.00005	<0.000050	<0.000050	0.000058	0.000051	0.000111	NT	0.00009	NT
Magnesium	-	mg/L	3.16	3.98	3.1	3.11	2.63	2.81	3.39	3.73	3.18	2.83	2.73	2.48	2.47	3.93	3.99	2.63	4.52	3.99	5.52
Manganese	0.05	mg/L	0.317	0.798	0.279	0.297	0.24	0.135	0.633	0.856	0.217	0.224	0.223	0.185	0.188	1.01	1.02	0.158	1.03	1.97	1.55
Mercury	0.001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0000050	NT	<0.0000050	NT
Nitrate	10	mg/L	<0.020	0.026	0.151	0.15	0.19	0.243	0.14	0.039	0.229	0.146	0.133	0.157	0.171	<0.020	<0.020	0.124	0.048	0.1	0.044
Nitrite	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT	<0.010	NT
Organic Nitrogen		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.399	0.2	0.239	0.816
TKN	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.467	0.718	NT	1.5
pH	6.5-8.5	mg/L	6.36	6.11	6.35	6.32	6.45	6.29	6.39	6.46	6.53	7.20	7.19	6.78	6.5	6.33	6.6	7.25	6.84	7.18	6.62
Total Phosphorous	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.324	NT	0.246	NT
Potassium	-	mg/L	1.17	0.807	NT	NT	NT	0.661	0.731	0.649	0.693	0.698	0.709	0.649	0.633	0.61	0.62	0.66	NT	0.628	NT
Sodium	200	mg/L	3.58	3.4	3.49	3.46	3.41	3.39	3.38	3	3.46	3.35	3.26	3.17	3.2	3.36	3.29	3.34	3.49	3.51	3.62
Suspended Solids	-	mg/L	69500	13500	6490	10600	11700	5070	2540	464	277	416	446	277	1120	816	330	4.95	1070	253	824
TDS	500	mg/L	199	88	268	340	69	112	84	68	76	79	86	75	76	86	81	75	81	73	98
Sulfate	500	mg/L	12.4	7.51	7.48	8.15	7.45	7.07	6.27	5.58	5.75	5.2	5.05	4.9	5.45	5.08	4.97	4.95	4.69	4.24	4.02
Zinc	5	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0039	NT	0.0049	NT
Volatile Organics																					
Benzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Dichloromethane	50	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<5.0	NT	<2.0	NT
Toluene	24	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Vinyl Chloride	2	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Other Organics																					
BOD_5	-	mg/L	3.1	2.9	2.9	2.4	5	2.3	2.3	3.1	2.4	<2.0	2.3	2.5	2.6	<2.0	<2.0	<2.0	<3.0	<3.0	<5.0
COD	-	mg/L	124	179	13	11	122	48	89	87	15	29	47	33	42	18	27	22	18	14	56
DOC	5	mg/L	4.7	3	2.6	1.9	1.6	7.5	2.8	2.19	3.6	2.59	2.49	2.14	2.8	6.46	4.29	2.78	2.89	2.9	3.82
Phenol	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0010		0.0015	NT
Field Parameters																					
pH	-		6.64	6.28	7.06		7.65	7.81	7.08	8.44	6.58	7.49	7.49	6.04	6.04	5.95	5.95	6.94	6.08	6.2	6.15
Conductivity	-	µS/cm	0.05	0.11	0.06		0.12	0.13	0.12	0.15	0.11	0.1	0.1	0.1	0.1	0.139	0.139	0.111	0.149	0.127	0.166
DO	-	%	12.1	15.5	18.4		30.3	47.6	24.5	17	21	24.9	24.9	27.2	27.2	24	24	44.9	38.3	27.5	21.1
Temp	-	°	7.7	11.4	7.8		9.5	11	8.9	7.6	8.5	9.4	9.4	9	9	10.9	10.9	7.8	12.2	9.2	10.7

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.14: Sampling Location - MW1-17
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	14-Jun-23	Oct-23
Miscellaneous Parameters														
			Well Constructed in											
Nitrite (as N)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT
Bicarbonate (HCO3)	-	mg/L	44.7	89	107	134	110	110	104	NT	80	94.7	70.5	NT
Carbonate (CO3)	-	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NT	<2.0	<1.0	<2.0	NT
Hydroxide (OH)	-	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NT	<2.0	<1.0	<2.0	NT
Cyanide	0.2	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	<0.0020	<0.0020	<0.0050	<0.0050
Ion Balance Calculation														
Cation - Anion Balance	-	%	0	-7.2	15.2	4.2	2.8	1.1	-2.8	NT	4.9	5	3.36	7.88
TDS (calculated)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	Nov-00	May-00	266	192
Anion Sum	-	me/L	1.22	2.2	3.59	4.25	3.22	3.3	2.84	NT	2.64	2.24	2.3	2.63
Cation Sum	-	me/L	1.22	1.9	4.87	4.62	3.4	3.37	2.69	NT	2.92	2.48	2.46	3.08
Inorganics														
Alkalinity	500	mg/L CaCO3	44.7	89	107	134	110	110	104	NT	80	94.7	70.5	93.4
Ammonia	-	mg/L	0.573	0.755	4.46	1.28	1.02	0.707	0.616	1.14	0.459	1.15	0.476	0.768
Arsenic	0.025	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	0.00103	NT	0.00087	NT
Barium	1	mg/L	0.0164	0.00297	0.056	0.0246	0.0281	0.0317	0.0213	0.0424	0.0252	0.0547	0.0257	0.0396
Boron	5	mg/L	<0.010	0.023	0.075	0.04	0.03	0.042	0.026	0.038	0.024	0.033	0.023	0.039
Cadmium	0.0001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	0.0000116	NT	0.0000167	NT
Calcium	-	mg/L	6	0.535	31.1	25.7	16.7	16.6	11.2	20.3	14.4	19.3	15	23.8
Chloride	250	mg/L	8.9	9.28	27.7	14.4	17.6	11.5	8.94	NT	15.4	21.1	17.4	25.8
Chromium	0.05	mg/L	0.00152	0.00124	0.00188	0.00178	0.00111	0.00187	NT	0.00301	0.00202	NT	0.00151	NT
Conductivity	-	µS/cm	110	205	363	408	287	314	272	NT	271	228	225	262
Copper	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NA	NT	0.00301	NT
Fluoride		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	0.048	0.093	0.05	0.028
Hardness		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	57.7	84.6	65	99.6
Iron	0.3	mg/L	3.53	0.246	12.5	1.81	3.58	2.34	3.4	11.4	3.92	15.3	6.15	14.4
Lead	0.01	mg/L	0.000385	0.000975	0.00392	0.000504	0.00108	0.000751	0.000858	0.00129	0.0011	NT	0.000502	NT
Magnesium	-	mg/L	1.89	0.14	11.4	8.48	6.86	6.27	4.08	7.44	5.3	8.83	6.7	9.76
Manganese	0.05	mg/L	0.196	0.00765	1.04	0.901	0.618	0.623	0.39	0.741	0.433	0.835	0.654	0.892
Mercury	0.001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	<0.0000050	NT	0.0000071	NT
Nitrate	10	mg/L	0.036	0.076	0.023	0.034	0.118	0.093	0.069	NT	0.092	0.068	0.235	0.068
Nitrite	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	NT	<0.010	NT
Organic Nitrogen		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	3.7	1	0.734	0.892
TKN	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	4.2	2.15	NT	1.66
pH	6.5-8.5	mg/L	6.41	6.78	6.82	6.79	7.05	6.91	6.78	NT	7.13	7.02	7.21	7.16
Total Phosphorous	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	0.87	NT	0.45	NT
Potassium	-	mg/L	0.641	0.227	0.937	1.05	1.62	1.75	1.16	2.11	1.16	NT	1.25	NT
Sodium	200	mg/L	11.6	40.6	30.5	54.7	39.2	40.4	34.6	28	33.6	17.1	19.3	10.1
Suspended Solids	-	mg/L	12800	18700	328000	32600	6660	3000	1790	NT	29	1000	1740	468
TDS	500	mg/L	151	328	2340	410	364	263	283	NT	317	186	266	192
Sulfate	500	mg/L	3.56	7.45	31.7	56	25.1	37.7	24.4	NT	29	3.69	18.1	1.31
Zinc	5	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	0.0121	NT	0.0101	NT
Volatile Organics														
Benzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Dichloromethane	50	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	<5.0	NT	<2.0	NT
Toluene	24	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Vinyl Chloride	2	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	NT	<0.50	NT
Other Organics														
BOD_5	-	mg/L	9.4	6.2	13.4	6.9	3.9	6	8.2	NT	4.3	<3.0	<3.0	6.4
COD	-	mg/L	1150	476	2980	1520	242	83	113	96	66	110	130	86
DOC	5	mg/L	12.2	15.5	29.4	19.5	14.7	21.7	16.4	30.9	20.9	24.9	15.4	21.7
Phenol	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	0.0026	NT	0.0016	NT
Field Parameters														
pH	-		7.52	7.07	7.62	7.73	8.61	8.71	7.84	6.94	6.58	6.67	5.52	6.68
Conductivity	-	µS/cm	0.17	0.26	0.4	0.49	0.34	0.34	0.31	0.347	0.341	0.36	0.313	0.275
DO	-	%	28.5	29.8	30.2	33.6	33.3	27	38.2	21.4	33.7	55.7	46.8	67.2
Temp	-	°	5.9	10.6	6	4.4	12.7	7	11.7	14.3	10.2	16	11.8	11.4

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.15: Sampling Location - MW2-17
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Nov-17	May-18	May-18	Nov-18	Nov-18	Feb-20	Feb-20	Jun-20	Jun-20	Nov-20	May-21	Oct-21	17-May-22	17-May-22	21-Sep-22	21-Sep-22	Jun-23	Jun-23	Oct-23	Oct-23
Miscellaneous Parameters					DUPLICATE		DUPLICATE		DUPLICATE		DUPLICATE					Duplicate		Duplicate		Duplicate		Duplicate
Nitrite (as N)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	<0.010	NT	NT
Bicarbonate (GCO3)	-	mg/L	38.2	49.2	38.3	64.9	65.1	65.3	60	69	66.4	64.8	61.1	72	71.3	64.2	69.5	69.4	65.5	66.3	NT	NT
Carbonate (CO3)	-	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	NT	NT
Hydroxide (OG)	-	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	NT	NT
Cyanide	0.2	mg/L													<0.0020	<0.0020	<0.0020	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050
Ion Balance Calculation																						
Cation - Anion Balance	-	%	3.2	-4.6	-6.4	-5.7	-5.4	0.2	3	-2.5	-1.4	-2.7	-4.8	-1.6	-4.1	-0.8	7	8	-1.4	-3.21	-4.19	-4.48
TDS (calculated)	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	236	127	84.5	85.2	158	195	146	155
Anion Sum	-	me/L	3.79	1.43	1.51	2.29	2.36	1.66	1.63	1.77	1.77	1.73	1.79	2.05	1.76	1.66	1.44	1.44	2.17	2.25	1.74	1.75
Cation Sum	-	me/L	4.04	1.3	1.33	2.04	2.12	1.67	1.73	1.69	1.72	1.64	1.63	1.99	1.62	1.64	1.64	1.68	2.11	2.11	1.6	1.6
Inorganics																						
Alkalinity	500	mg/L CaCO3	38.2	49.2	38.3	64.9	65.1	65.3	60	69	66.4	64.8	61.1	72	71.3	64.2	69.5	69.4	65.5	66.3	71.5	72
Ammonia	-	mg/L	0.101	0.13	0.186	0.029	0.147	<0.020	<0.020	0.026	0.03	0.0079	0.0091	0.0086	0.035	0.0255	0.026	0.036	<0.0500	<0.0500	0.0107	0.0106
Arsenic	0.025	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.00044	0.00044	NT	NT	0.00043	0.00043	NT	NT
Barium	1	mg/L	0.0198	0.00796	0.00797	0.0119	0.0122	0.00967	0.00981	0.0106	0.0109	0.012	0.00985	0.0127	0.0113	0.0115	0.0107	0.0114	0.0133	0.0139	0.0115	0.0115
Boron	5	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	<0.010
Cadmium	0.0001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.0000064	0.0000065	NT	NT	0.0000058	0.000006	NT	NT
Calcium	-	mg/L	13.5	8.31	8.43	20.3	20.4	18.8	18.8	17.9	18.4	17.4	16.1	19.1	17.8	18.1	18.3	18.7	20.1	19.6	18.7	18.6
Chloride	250	mg/L	100	8.34	20.5	25.9	28.3	4.35	6.97	6.02	8.01	7.27	13.1	13	4.91	6.05	2.53	2.54	22.1	24.4	2.56	2.59
Chromium	0.05	mg/L	0.00079	0.00106	0.00092	0.00124	0.00059	0.0005	0.00059	0.00066	0.00061	0.00089	NT	0.00107	0.00069	0.00067	NT	NT	0.0008	0.00075	NT	NT
Conductivity	-	µS/cm	442	146	165	229	234	162	170	162	168	162	178	197	162	162	150	152	214	221	168	168
Copper	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NA	NT	NT	NT	0.00052	0.00049	NT	NT
Fluoride		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.022	0.0026	0.048	0.048	<0.020	<0.020	<0.020	<0.020
Hardness		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	66.4	67.6	72	73	76	75	70.2	70.2
Iron	0.3	mg/L	0.083	0.094	0.09	<0.010	<0.010	<0.010	<0.010	0.01	0.011	0.046	0.023	0.156	0.014	0.019	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead	0.01	mg/L	0.00006	0.000149	0.000075	<0.000050	<0.000050	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000050	0.000091	<0.000050	<0.000050	NT	NT	<0.000050	<0.000050	NT	NT
Magnesium	-	mg/L	3.53	2.48	2.5	6.13	6.25	5.98	6.08	6.01	6.14	5.33	4.92	5.9	5.32	5.44	6.38	6.53	6.27	6.34	5.72	5.78
Manganese	0.05	mg/L	0.0076	0.00228	0.00209	0.00042	0.00036	0.00126	0.00078	0.00057	0.00073	0.00103	0.00077	0.00181	0.00056	0.00053	<0.00050	<0.00050	0.00016	0.00019	0.00028	0.00026
Mercury	0.001	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0000050	<0.0000050	NT	NT	<0.0000050	<0.0000050	NT	NT
Nitrate	10	mg/L	0.03	0.055	0.032	0.084	0.073	0.088	0.082	0.074	0.0801	0.084	0.068	0.075	0.058	0.062	0.057	0.063	0.063	0.06	0.072	0.071
Nitrite	1	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.010	<0.010	NT	NT	<0.010	<0.010	NT	NT
Organic Nitrogen		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	3.13	6.68	1.1	1.62	1.6	1.54	0.813	0.785
TKN	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	3.16	6.7	1.12	1.66	NT	NT	0.824	0.796
pH	6.5-8.5	mg/L	6.68	6.68	6.54	7.12	7	7.46	7.25	7.25	7.29	7.19	6.94	7.06	7.21	7.2	7.58	7.68	7.54	7.63	7.57	7.5
Total Phosphorous	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	4.1	2.4	NT	NT	0.622	0.638	NT	NT
Potassium	-	mg/L	0.923	0.428	0.426	0.951	0.96	0.856	0.868	0.83	0.838	0.844	0.765	0.974	0.774	0.797	NT	NT	0.848	0.858	NT	NT
Sodium	200	mg/L	69.8	14.6	14.9	11.4	12.7	5.02	6.14	6.41	6.4	6.86	9.05	11.6	6.27	6.02	4.2	4.48	13.1	13.6	4.02	4.04
Suspended Solids	-	mg/L	4920	2970	1810	2010	4420	566	693	363	402	1510	413	833	9.32	3210	2350	2860	1670	1310	682	537
TDS	500	mg/L	448	161	234	224	193	136	151	154	150	163	125	121	236	127	140	132	158	195	146	155
Sulfate	500	mg/L	9.35	10	7.65	12.3	12.3	11.1	10.9	10.5	10.3	10.7	9.4	11.7	9.32	9.66	10.2	10.3	11.2	11	11.2	11.2
Zinc	5	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0010	<0.0010	NT	NT	<0.0010	<0.0010	NT	NT
Volatile Organics																						
Benzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	<0.50	NT	NT	<0.50	<0.50	NT	NT
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	<0.50	NT	NT	<0.50	<0.50	NT	NT
Dichloromethane	50	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<5.0	<5.0	NT	NT	<2.0	<2.0	NT	NT
Toluene	24	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	<0.50	NT	NT	<0.50	<0.50	NT	NT
Vinyl Chloride	2	µg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.50	<0.50	NT	NT	<0.50	<0.50	NT	NT
OtGer Organics																						
BOD_5	-	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.0	<3.3	<5.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
COD	-	mg/L	131	235	275	260	281	106	90	42	50	128	64	52	16	28	74	103	<10	<10	67	<10
DOC	5	mg/L	8.7	4.1	7.1	2	1.8	1.41	1.4	3.92	3.03	4.51	2.96	3.77	2.46	3.06	2.22	1.98	2.72	1.99	2.77	1.37
Phenol	-	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.0010	0.005	NT	NT	<0.0010	<0.0010	NT	NT
Field Parameters																						
pH	-		7.13	8.57	8.57	7.65	7.65	7.76	7.76	8.65	8.65	8.58	7.56	6.88	6.85	6.85	4.82	4.82	5.62	5.62	6.57	6.57
Conductivity	-	µS/cm	0.42	0.15	0.15	0.19	0.19	0.17	0.17	0.16	0.16	0.16	0.18	0.181	0.178	0.178	0.178	0.178	0.187	0.187	0.168	0.168
DO	-	%	38.2	43.8	43.8	56.2	56.2	45.6	45.6	46.6	46.6	51.2	44.9	48.6	50.4	50.4	35.2	35.2	52	52	55.4	55.4
Temp	-	°	9.9	7.6	7.6	8.7	8.7	7	7	8.7	8.7	9.4	10.5	11.3	7.3	7.3	10.9	10.9	8.2	8.2	10.1	10.1

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.16: Sampling Location - MW1-20
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 2

KEC Project Ref. No. 2331

Parameter	ODWS	Units	Date of Sampling Event						
			Nov-20	44335	Oct-21	May-22	Sep-22	14-Jun-23	Oct-23
Miscellaneous Parameters									
			Well Constructed in Fall 2020						
Nitrite (as N)	-	mg/L	NT	NT	NT	NT	NT	<0.200	NT
Bicarbonate (HCO3)	-	mg/L	76.1	76	74.5	74.6	79.4	70.3	NT
Carbonate (CO3)	-	mg/L	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Hydroxide (OH)	-	mg/L	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	NT
Cyanide	0.2	mg/L				<0.0020	<0.0020	<0.0050	<0.0050
Ion Balance Calculation									
Cation - Anion Balance	-	%	5.1	-2.1	0.4	7.5	-1	0.19	1.62
TDS (calculated)	-	mg/L	NT	NT	NT	NT	Nov-03	1910	2260
Anion Sum	-	me/L	1.75	21.6	24.9	22.4	25.7	26.8	27.3
Cation Sum	-	me/L	1.94	20.7	25.1	26.1	25.3	26.9	28.2
Inorganics									
Alkalinity	500	mg/L CaCO3	76.1	76	74.5	74.6	79.4	70.3	83.2
Ammonia	-	mg/L	<0.0050	1.91	1.93	2.33	2.52	2	2.3
Arsenic	0.025	mg/L	NT	NT	NT	Jan-00	NT	0.00213	NT
Barium	1	mg/L	0.0136	0.23	0.312	0.347	0.326	0.277	0.403
Boron	5	mg/L	0.018	<0.010	<0.010	<0.10	0.011	<0.100	0.015
Cadmium	0.0001	mg/L	NT	NT	NT	<0.000050	NT	<0.0000500	NT
Calcium	-	mg/L	21.6	133	141	183	158	153	172
Chloride	250	mg/L	0.77	711	830	742	863	899	910
Chromium	0.05	mg/L	0.00058	0.00092	0.00069	<0.0050	NT	<0.00500	NT
Conductivity	-	µS/cm	162	2410	2760	2720	2360	2840	3060
Copper	1	mg/L	NT	NT	NT	NA	NT	0.00221	NT
Fluoride			NT	NT	NT	<0.02	<0.10	<0.400	<1.00
Hardness			NT	NT	NT	Oct-01	Aug-01	571	627
Iron	0.3	mg/L	0.061	17.1	20.8	21.3	20.4	26.2	24.1
Lead	0.01	mg/L	<0.00005	<0.000050	<0.000050	<0.00050	NT	<0.000500	NT
Magnesium	-	mg/L	6.66	37.7	41.1	48.7	47.6	45.8	48
Manganese	0.05	mg/L	0.0163	5.29	5.4	6.73	6.48	6.51	6.7
Mercury	0.001	mg/L	NT	NT	NT	<0.0000050	NT	<0.0000050	NT
Nitrate	10	mg/L	0.091	<0.20	<0.20	<0.020	<0.10	<0.400	<1.00
Nitrite	1	mg/L	NT	NT	NT	<0.010	NT	<0.200	NT
Organic Nitrogen						0.772	3.40	0.76	2.06
TKN	-	mg/L	NT	NT	NT	3.11	0.88	NT	4.36
pH	6.5-8.5	mg/L	7.36	6.64	6.75	7.35	7.49	7.27	7.31
Total Phosphorous	-	mg/L	NT	NT	NT	Jan-00	NT	8.13	NT
Potassium	-	mg/L	1.66	1.84	2.21	2.09	NT	1.82	NT
Sodium	200	mg/L	6.17	225	303	265	303	326	330
Suspended Solids	-	mg/L	388	15400	10400	<0.30	26400	39900	71500
TDS	500	mg/L	162	1610	1560	1700	1620	1910	2260
Sulfate	500	mg/L	9.85	<3.0	<3.0	<0.30	<1.5	<6.00	<15.0
Zinc	5	mg/L	NT	NT	NT	<0.010	NT	<0.0100	NT
Total Metals									
Arsenic		mg/L	NT	NT	NT	0.0204	0.0304	<0.50	NT
Barium		mg/L	NT	NT	NT	0.79	0.956	<0.50	NT
Boron		mg/L	NT	NT	NT	<0.10	<0.10	<2.0	NT
Cadmium		mg/L	NT	NT	NT	0.000417	0.000591	<0.50	NT
Chromium		mg/L	NT	NT	NT	0.112	0.137	<0.50	NT
Copper		mg/L	NT	NT	NT	0.154	0.189	NT	NT
Iron		mg/L	NT	NT	NT	90.6	111	<5.0	<10.0
Lead		mg/L	NT	NT	NT	0.0554	0.0734	47	67
Mercury		mg/L	NT	NT	NT	0.000015	0.000005	9.74	10.5
Zinc		mg/L	NT	NT	NT	0.163	0.195	0.0015	NT
Volatile Organics									
Benzene	5	µg/L	NT	NT	NT	<0.50	NT	NT	NT
1,4 Dichlorobenzene	5	µg/L	NT	NT	NT	<0.50	NT	NT	NT
Dichloromethane	50	µg/L	NT	NT	NT	<5.0	NT	NT	NT
Toluene	24	µg/L	NT	NT	NT	<0.50	NT	NT	NT
Vinyl Chloride	2	µg/L	NT	NT	NT	<0.50	NT	NT	NT
Other Organics									
BOD_5	-	mg/L	<2.0	<15	<5.0	<5.0	<3.0	<5.0	<10.0
COD	-	mg/L	67	178	84	73	120	47	67
DOC	5	mg/L	2.63	14.4	14.2	13.3	10.9	9.74	10.5
Phenol	-	mg/L	NT	NT	NT	Jan-00	NT	0.0015	NT
Field Parameters									
pH	-		7.75	6.95	6.68	6.48	6.36	6.12	6.49
Conductivity	-	µS/cm	2.31	2.06	2.947	2.608	2.845	2.64	2.581
DO	-	%	22	20.1	27.1	16.2	26	20.1	28.1
Temp	-	°	7.6	9.1	9.2	7	8.9	8.2	9

Shaded concentrations exceed ODWS
NT = Not Tested
ND = Not Detected

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.17: Sampling Location - SW1
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 3

Parameter	PWQO	Units	Date of Sampling Event																		
			Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14
Miscellaneous Parameters																						
Nitrite (as N)		mg/L																0.139	0.378	0.096	0.027	0.047
Bicarbonate (HCO3)		mg/L																722	508	436	686	NT
Carbonate (CO3)		mg/L																<5	<5.0	<5.0	<5.0	NT
Hydroxide (OH)		mg/L																<5	<5.0	<5.0	<5.0	NT
Ion Balance Calculation																						
Cation - Anion Balance		%																5.2	8.4	7.45	NT	6.7
TDS (calculated)		mg/L																906	1050	743	767	NT
Anion Sum		me/L																16.4	16.2	11.3	NT	8.53
Cation Sum		me/L																18.2	19.2	14.9	NT	9.76
Inorganics																						
Alkalinity		mg/L CaCO3	562	601	617	580	430	506	601	558	678	591	540	546	598	570	579	592	508	436	562	329
Ammonia		mg/L	27	26	22.2	28.6	32.5	30.1	20.5	23.8	28	29.5	27.4	24.5	23.9	28.3	24.1	29.8	11	17.1	21.4	13.7
Arsenic	0.005	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002	0.002	0.0025	0.0018	0.003	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	0.00061	<0.0010
Barium		mg/L	0.04	0.06	0.06	0.0865	0.0776	0.072	0.09	0.08	0.11	0.078	0.081	0.102	0.091	0.108	0.102	0.114	0.074	0.083	0.101	0.076
Boron	0.2	mg/L	0.56	0.63	0.07015	0.1403	0.428	0.599	0.64	0.51	0.56	0.694	0.736	0.649	0.638	0.73	0.923	0.762	1.03	0.683	0.719	0.619
Cadmium	0.0001	mg/L	<0.0001	0.0004	0.00036	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.000090	<0.000090	<0.000090	<0.00010	0.000029	0.000029	<0.000017	<0.000010	0.000023
Chloride		mg/L	59.8	61	101	85	83.1	80.2	109	114	164	142	174	180	143	196	193	162	238	115	112	52
Chromium		mg/L	0.006	0.001	0.002	0.002	0.0019	0.0133	<0.001	0.002	0.002	0.0014	0.0014	0.0014	0.0011	<0.0010	0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Conductivity		µS/cm	522	1280	1350	1050	1275	892	1330	1380	1630	1540	1410	1470	1470	1580	1660	1570	1820	1290	1360	832
Copper	0.005	mg/L	<0.001	<0.001	<0.001	0.001	0.00198	<0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	0.0011	0.00054	0.001
Iron	0.3	mg/L	0.18	0.4	1.67	0.83	10.8	2.02	0.9	0.53	1.13	0.992	0.52	1.43	1.72	1.78	0.845	1.19	0.196	0.597	1.49	5.58
Lead	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.000090	<0.0010
Manganese		mg/L	0.202	0.082	0.38	NT	0.768	0.2	NT	NT	NT	NT	NT	NT	NT	0.636	0.241	0.445	NT	NT	NT	NT
Manganese (Dissolved)		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Mercury	0.0002	mg/L	<0.0001	<0.0001	0.0009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.000010	<0.000010	<0.00010	<0.000010
Nitrate		mg/L	<0.003	0.43	0.3	<0.1	0.18	<0.1	0.1	0.12	0.13	0.06	0.054	0.075	<0.030	0.05	0.125	0.119	1.52	0.274	<0.03	0.243
Nitrite		mg/L	<0.02	0.18	0.41	<0.05	<0.03	0.035	<0.02	0.25	<0.1	<0.2	<0.4	<0.020	<0.020	<0.40	0.161	0.139	0.378	0.096	0.027	0.047
TKN		mg/L	27.6	26	23.2	35.1	32	26.4	21.7	25.4	29	30.2	26.9	27.3	29.8	28.8	24.6	29.5	13.7	20.2	23.4	17.3
pH	6.5-8.5	mg/L	7.4	7.9	8.1	7.65	7.51	7.54	7.8	7.68	7.86	7.74	7.9	7.93	7.75	7.63	7.99	8.22	8.29	7.75	7.74	7.22
Total Phosphorous	0.01	mg/L	NT	NT	NT	0.071	0.0791	0.0908	0.032	0.026	0.086	0.0417	0.0214	0.0449	0.0985	0.0829	0.0561	0.246	0.0231	0.0403	0.0264	0.0508
Suspended Solids		mg/L	2	10	10	20	36	7	2	8.5	71.8	5.6	3.6	41.4	14.4	17.4	17.8	NT	14.1	49.2	128	40.8
TDS		mg/L	670	670	810	820	743	735	900	780	920	875	851	878	888	870	925	876	1050	669	764	433
Sulfate		mg/L	0.5	2.4	3.9	0.4	<1.0	<1	14.9	1	2.1	0.66	1.67	0.51	11	8.76	3.61	1.23	48.7	40.3	0.58	22.9
Zinc	0.02	mg/L	<0.003	0.038	<0.003	0.001	0.0038	0.0049	0.01	0.005	0.012	0.0036	0.0147	0.0038	0.0085	0.004	0.0053	0.0054	0.0084	0.0045	0.0024	0.0092
Zinc (Dissolved)		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Other Organics																						
BOD_5		mg/L	4	<2	3	3	3.8	3.7	4	3	5	11.8	5.3	2.9	7.3	3.8	4.8	5.6	<2.0	2.6	7.3	8.4
COD		mg/L	NT	68	78	90	79	73	79	74	82	78.6	84.1	90.3	85.9	88.8	82.6	119	92.8	55.9	78.1	45
Phenols	0.001	mg/L	0.009	0.01	0.009	0.025	0.0115	0.0073	0.016	0.011	0.019	0.0109	0.0033	0.0065	0.0043	0.0124	0.0067	0.0233	0.0024	<0.0010	0.0029	0.0091
DOC		mg/L	16	21	22	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Field Parameters																						
Temperature		°C						15.2	11.7		8.9	13.1	6.8	23.9	16.2	16.2	18.6	24.3	16.6	19.7	13.3	9.9
pH								7.43	7.48		7.79	7.4	7.57	7.89	8.17	8.01	7.9	7.78	8.06	7.34	6.82	6.89
Conductivity		mS/cm							1330		1580	1300	1380	1470	1380	1530	1.76	1.7	1.85	1.31	1.36	0.76
Dissolved Oxygen		%						88.2	23.9		36.5	52.4	24.4	70.5	27.3	39.4	23.8	34.1	72.5	80.3	11.6	49.9

Shaded concentrations exceed PWQO
ND = Not Detected
NT = Not Tested

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.17: Sampling Location - SW1
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 3

KEC Project Ref. No. 2331

Parameter	PWQO	Units	Date of Sampling Event																		
			Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Aug-23	Sep-23	Oct-23
Miscellaneous Parameters												Frozen								NOT SAMPLED		
Nitrite (as N)		mg/L	0.027	0.024	0.098	0.293	0.263	0.121	0.011	0.097	0.035		0.094	0.022	0.106	0.018	<0.010	0.169	0.071	DRY	0.191	<0.100
Bicarbonate (HCO3)		mg/L	416	320	311	355	249	287	213	295	198		409	353	293	386	356	370	347		414	412
Carbonate (CO3)		mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	9.2	16.6	26.4		<2.0	<2.0
Hydroxide (OH)		mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0		<2.0	<2.0
Ion Balance Calculation																						
Cation - Anion Balance		%	1.7	-6.3	-0.9	-0.5	1.2	2.9	5.7	1.2	-10.3		-0.2	-1.4	-2.3	5.1	-1	6	0.6		3.33	3.51
TDS (calculated)		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT	547	521		659	612
Anion Sum		me/L	10.5	8.35	10.5	9.76	8.43	7.6	5.32	7.34	5.58		9.99	8.51	7.07	9.56	8.91	9.08	9.14		11.6	11
Cation Sum		me/L	10.9	7.36	10.3	9.65	8.63	8.05	5.96	7.52	4.54		9.95	8.28	6.75	10.6	8.74	10.3	9.25		12.4	11.8
Inorganics																						
Alkalinity		mg/L CaCO3	416	320	311	355	249	287	213	295	198		409	353	293	386	365	386	373		414	412
Ammonia		mg/L	14.3	13.5	7.56	6.33	2.61	6.94	6.26	8.93	3.88		8.28	9.27	5.61	9.25	9.2	7.67	4.65		2.7	7.13
Arsenic	0.005	mg/L	<0.0010	0.0006	0.00081	0.00062	0.00058	0.00112	0.00161	0.00043	0.0006		<0.0010	0.00048	0.00046	0.00112	0.00099	<0.0010	0.00054		0.00053	0.00037
Barium		mg/L	0.086	0.0706	0.0984	0.0362	0.0409	0.146	0.0648	0.0616	0.0388		0.0863	0.0602	0.0692	0.126	0.126	0.101	0.0622		0.0849	0.0703
Boron	0.2	mg/L	0.49	0.514	0.843	0.727	0.721	0.442	0.277	0.458	0.324		0.72	0.393	0.486	0.625	0.631	0.8	0.705		1.14	0.76
Cadmium	0.0001	mg/L	<0.000017	0.000017	0.000025	0.0000118	0.0000162	0.000192	0.000106	<0.0000050	<0.000030		<0.00005	0.0000071	0.0000871	0.0000285	0.000102	<0.000050	0.000012		0.0000054	<0.0000050
Chloride		mg/L	75.5	59.5	91.5	72.2	83	45.1	29.6	40.4	43.8		57.3	46.8	37.3	62.7	48.4	81	49.8		102	88.5
Chromium		mg/L	<0.0010	0.00083	0.00104	0.00073	0.00068	0.00376	0.00592	0.00064	0.00135		<0.005	0.00067	0.00057	0.00171	0.00233	<0.0050	0.00083		0.00058	0.00058
Conductivity		µS/cm	1030	799	1000	887	837	729	533	718	517		888	793	672	911	857	864	810		1090	1060
Copper	0.005	mg/L	<0.0010	0.00085	0.00148	0.00077	0.00156	0.00548	0.0115	0.00077	0.0017		<0.005	0.00066	0.00113	0.00125	0.0036	<0.0050	0.00103		<0.00050	0.00054
Iron	0.3	mg/L	3.09	2.33	5.04	1.26	1.41	9.88	10.3	1.58	2.85		1.42	3.19	1.8	19.6	17	3.7	3.2		0.439	1.42
Lead	0.001	mg/L	<0.0010	0.000203	0.000724	0.000061	0.000251	0.00245	0.0111	0.000229	0.000623		<0.0005	0.000084	0.000126	0.00083	0.00182	<0.00050	0.000305		<0.000050	<0.000050
Manganese		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT	0.355			0.0882	0.176
Manganese (Dissolved)		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	0.0589	0.225	<0.0000050		<0.0000050	<0.0000050
Mercury	0.0002	mg/L	<0.00001	<0.000005	<0.0000050	<0.000005	<0.0000050	<0.0000050	0.0000288	<0.0000050	<0.0000050		<0.000005	<0.000005	<0.0000050	0.0000062	0.0000055	<0.0000050	<0.0000050		<0.0000050	<0.0000050
Nitrate		mg/L	0.071	0.085	0.304	1.41	1.2	2.06	0.517	0.826	0.265		0.227	0.527	0.999	0.205	0.999	0.169	0.644		0.112	0.378
Nitrite		mg/L	0.027	0.024	0.098	0.293	0.263	0.121	0.011	0.097	0.035		0.094	0.022	0.106	0.018	<0.010	0.1	0.071		0.191	<0.100
TKN		mg/L	12.9	13.2	8.29	8.79	4.27	11.3	9.5	11	4.52		10.5	11.5	7.27	11	13	12.2	5.55		4.04	6.82
pH	6.5-8.5	mg/L	7.44	7.39	7.6	7.9	7.99	7.71	7.08	7.79	7.34		8.09	7.72	8.03	7.93	8.32	8.38	8.48		8.25	8.28
Total Phosphorous	0.01	mg/L	0.03	0.0765	0.121	0.188	0.0512	0.292	0.309	0.0537	0.0567		0.023	0.0532	0.062	0.141	0.223	0.161	0.0636		0.0294	0.0197
Suspended Solids		mg/L	21.1	19.4	41.5	27.2	10.5	283	391	23.7	25.5		5.9	9.5	11.2	121	202	114	53.5		14.2	15.5
TDS		mg/L	561	462	587	562	494	388	282	394	348		545	444	354	520	458	551	521		659	612
Sulfate		mg/L	3.49	13.4	79.6	24.8	48.3	20.6	9.17	11	17.9		8.57	4.62	3.97	2.68	8.56	14.3	11.2		22.9	11.5
Zinc	0.02	mg/L	0.0065	0.0063	0.0161	0.0069	0.0068	0.043	0.033	0.0066	0.0162		<0.030	<0.030	0.0224	0.007	0.0292	<0.030	0.0039		<0.0030	<0.0030
Zinc (Dissolved)		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	0.0021	0.0021	<0.0010		0.0019	0.0015
Other Organics																						
BOD_5		mg/L	<2.0	2.8	3	12.4	4.6	21.9	10.4	3.2	2.7		<2.0	<2.0	2.7	3.5	25.8	5.3	12.8		2.5	2.3
COD		mg/L	69	68	70	72	72	147	150	57	67		69	59	70	91	143	82	61		73	56
Phenols	0.001	mg/L	0.01	<0.001	0.0045	0.0054	<0.020	0.042	<0.020	<0.0010	<0.020		0.0013	<0.0010	0.0018	0.0145	0.0018	0.0021	0.0023		<0.0010	0.0019
DOC		mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	24.8	28.2	24.8		28.5	20.8
Field Parameters																						
Temperature		°C	9.7	12.1	14.3	16.6	15.2	10	3.1	18.5	2.5		16.3	9.8	19.1	17.1	19.9	25.7	22.4		18.9	12.4
pH			7.19	7.3	7.07	6.35	6.57	6.57	7.37	7.5	7.42		7.26	7.16	6.73	7.29	7.8	7.93	7.58		7.39	7.79
Conductivity		mS/cm	0.96	0.76	0.93	0.84	0.68	0.61	0.48	0.73	0.62		0.86	0.74	0.63	0.982	0.935	1.065	0.802		1.047	1.032
Dissolved Oxygen		%	30	39.4	33.1	109	73.1	104.3	34.9	137	30.4		63.1	48	108.1	51.7	142.5	136.6	142.1		92.6	99.6

Shaded concentrations exceed PWQO
ND = Not Detected
NT = Not Tested

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.18: Sampling Location - SW2
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 3

KEC Project Ref. No. 2331

Parameter	PWQO	Units	Date of Sampling Event												
			May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Aug-23	Sep-23	Oct-23
Miscellaneous Parameters			NOT SAMPLED		Frozen										
Nitrite (as N)		mg/L		<0.010		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bicarbonate (HCO3)		mg/L		133		146	121	120	185	112	230	123	212	243	228
Carbonate (CO3)		mg/L		<2.0		<2.0	<2.0	<2.0	<2.0	<2.0	8.8	<2.0	<2.0	<2.0	13.2
Hydroxide (OH)		mg/L		<2.0		<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0
Ion Balance Calculation															
Cation - Anion Balance		%		4.8		2.6	-1.2	2.4	-1	3.5	6	2.04	-2.58	3.79	-1.49
TDS (calculated)		mg/L		NT		NT	NT	NT	NT	NT	317	200	329	358	328
Anion Sum		me/L		3.54		3.27	2.69	2.74	4.28	2.56	4.99	2.88	5.17	5.84	5.79
Cation Sum		me/L		3.9		3.44	2.63	2.87	4.19	2.75	5.61	3	4.91	6.3	5.62
Inorganics															
Alkalinity		mg/L CaCO3		133		146	121	120	185	112	239	123	212	243	241
Ammonia		mg/L		0.619		0.038	0.0171	0.013	0.0279	0.0117	0.02	0.0152	0.0074	0.0096	0.298
Arsenic	0.005	mg/L		0.00104		0.00081	0.00049	0.00061	0.00074	0.0005	<0.0010	0.00062	0.00104	0.00083	0.0006
Barium		mg/L		0.0351		0.021	0.022	0.0288	0.0336	0.0182	0.0388	0.0159	0.0265	0.0424	0.0397
Boron	0.2	mg/L		0.291		0.184	0.097	0.133	0.198	0.152	0.38	0.255	0.427	0.515	0.433
Cadmium	0.0005	mg/L		0.0000441		0.0000057	<0.000005	0.0000195	0.0000069	0.0000087	<0.000050	<0.0000050	0.0000083	<0.0000050	<0.0000050
Chloride		mg/L		21.9		12.4	9.64	11.6	20.4	11.7	34.4	15.1	33.2	34.8	34.1
Chromium	0.001	mg/L		0.00287		0.00065	0.0006	0.00066	0.00066	0.00053	<0.0050	0.00058	0.00087	0.00066	0.00068
Conductivity		µS/cm		332		298	252	261	404	254	493	273	496	548	550
Copper	0.005	mg/L		0.00295		<0.001	<0.0005	0.00093	<0.00050	<0.0010	<0.0050	0.00069	<0.00050	<0.00050	<0.00050
Iron	0.3	mg/L		2.8		0.781	1.02	0.952	0.725	0.498	0.74	0.308	0.38	0.644	0.631
Lead	0.001	mg/L		0.00125		0.000061	0.00007	0.000181	0.000068	0.000092	<0.00050	0.00006	<0.000050	<0.000050	0.000057
Manganese		mg/L		NT		NT	NT	NT	NT	NT	0.043	NT	0.0341	0.0586	0.0115
Manganese (Dissolved)		mg/L								0.0116	0.0326	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Mercury	0.0002	mg/L		0.0000172		<0.000005	<0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Nitrate		mg/L		0.056		<0.020	<0.020	<0.020	0.02	<0.020	<0.010	<0.020	0.021	<0.020	0.021
Nitrite		mg/L		<0.010		<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010
TKN		mg/L		1.93		0.88	0.801	1.23	1.17	0.723	0.878	0.768	1.11	0.782	0.836
pH	6.5-8.5	mg/L		7.62		7.8	7.61	7.78	7.86	8.18	8.4	8.24	8.23	8.15	8.47
Total Phosphorous	0.01	mg/L		0.172		0.0157	0.0383	0.0986	0.0841	0.0282	0.0203	0.0151	0.0151	0.0159	0.0188
Suspended Solids		mg/L		190		<3.0	6.7	8.8	7.9	6.2	10.9	11.1	5.7	9.4	16.3
TDS		mg/L		238		221	168	135	256	151	305	200	329	358	328
Sulfate		mg/L		13.1		<0.30	<0.30	0.32	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.46
Zinc	0.02	mg/L		0.0128		0.0031	<0.003	0.0051	<0.0030	<0.0030	<0.030	<0.0030	<0.0030	<0.0030	<0.0030
Zinc (Dissolved)		mg/L		NT	NT	NT	NT	NT	NT	0.0014	0.0022	0.0034	<0.0010	0.002	<0.0010
Other Organics															
BOD_5		mg/L		5.8		<2.0	<2.0	3.2	2.2	<2.0	<3.0	<2.0	2.5	2	2.8
COD		mg/L		111		63	48	59	72	49	56	52	64	51	42
Phenols	0.001	mg/L		0.04		<0.0010	<0.001	0.0014	0.0027	0.0012	<0.0010	0.0016	<0.0010	0.0044	0.002
DOC		mg/L		NT		NT	NT	NT	NT	16.6	21.1	21.5	22.6	19.7	19.1
Field Parameters															
Temperature		°C		0.5		18.3	7.3	19.6	18.8	18.6	20.9	19.7	25.4	19.5	12.7
pH				8.04		8.01	8.1	7.33	7.3	8.08	7.7	7.82	8.01	7.38	7.92
Conductivity		mS/cm		0.34		0.31	0.27	0.25	0.464	0.288	0.756	0.301	0.494	0.536	0.54
Dissolved Oxygen		%		86.1		102.4	58	110.4	56.2	114.3	79.8	114	95.9	94.5	102.9

Shaded concentrations exceed PWQO
ND = Not Detected
NT = Not Tested

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.19: Sampling Location - SW3
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 3

KEC Project Ref. No. 2331

Parameter	PWQO	Units	Date of Sampling Event												
			May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	17-May-22	Sep-22	14-Jun-23	August 8, 223	11-Sep-23	Oct-23
Miscellaneous Parameters			NOT SAMPLED		Frozen	NOT SAMPLED		NOT SAMPLED	NOT SAMPLED	NOT SAMPLED	NOT SAMPLED	NOT SAMPLED	NOT SAMPLED	NOT SAMPLED	NOT SAMPLED
Nitrite (as N)		mg/L		<0.010			<0.010	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Bicarbonate (HCO3)		mg/L		24.3			30.5								
Carbonate (CO3)		mg/L		<2.0			<2.0								
Hydroxide (OH)		mg/L		<2.0			<2.0								
Ion Balance Calculation															
Cation - Anion Balance		%		3.2			23.5								
TDS (calculated)		mg/L		NT			NT								
Anion Sum		me/L		1.45			0.84								
Cation Sum		me/L		1.54			1.36								
Inorganics															
Alkalinity		mg/L CaCO3		24.3			30.5								
Ammonia		mg/L		0.872			0.26								
Arsenic	0.005	mg/L		0.00028			0.00068								
Barium		mg/L		0.0208			0.0127								
Boron	0.2	mg/L		0.011			<0.010								
Cadmium	0.0001	mg/L		0.0000254			0.0000244								
Chloride		mg/L		24.1			7.34								
Chromium		mg/L		0.00105			0.00151								
Conductivity		µS/cm		159			83.6								
Copper	0.005	mg/L		0.00204			0.00226								
Iron	0.3	mg/L		1.36			5.83								
Lead	0.001	mg/L		0.000137			0.00022								
Manganese		mg/L		NT			NT								
Manganese (Dissolved)															
Mercury	0.0002	mg/L		0.0000054			0.0000085								
Nitrate		mg/L		0.105			0.032								
Nitrite		mg/L		<0.010			<0.010								
TKN		mg/L		1.25			0.942								
pH	6.5-8.5	mg/L		6.35			6.97								
Total Phosphorous	0.01	mg/L		0.016			0.0317								
Suspended Solids		mg/L		50.4			14.7								
TDS		mg/L		86			80								
Sulfate		mg/L		13.2			1.16								
Zinc	0.02	mg/L		0.0038			0.0202								
Zinc (Dissolved)															
Other Organics															
BOD_5		mg/L		<2.0			<2.0								
COD		mg/L		33			62								
Phenols	0.001	mg/L		0.03			<0.0010								
DOC		mg/L		NT			NT								
Field Parameters															
Temperature		°C		2.4			7.3								
pH				8.37			8.14								
Conductivity		mS/cm		0.16			0.16								
Dissolved Oxygen		%		48			59.2								

Shaded concentrations exceed PWQO
ND = Not Detected
NT = Not Tested

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.20: Sampling Location - SW4
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 3

KEC Project Ref. No. 2331

Parameter	PWQO	Units	Sampling Event					
			May-22	Sep-22	Jun-23	Aug-23	Sep-23	Oct-23
Miscellaneous Parameters								
Nitrite (as N)		mg/L	0.013	<0.010	<0.020	<0.010	<0.010	0.055
Bicarbonate (HCO3)		mg/L	283	227	304	249	164	191
Carbonate (CO3)		mg/L	<2.0	3.1	<2.0	<2.0	<2.0	<2.0
Hydroxide (OH)		mg/L	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0
Ion Balance Calculation								
Cation - Anion Balance		%	-3.6	8	0.14	0.39	3.7	1.88
TDS (calculated)		mg/L	320	389	366	429	286	293
Anion Sum		me/L	6.59	5.26	7.12	6.4	4.55	5.22
Cation Sum		me/L	6.13	6.2	7.14	6.45	4.9	5.42
Inorganics								
Alkalinity		mg/L CaCO3	283	230	304	249	164	191
Ammonia		mg/L	11.9	16.8	9.79	5.14	4.4	8.47
Arsenic	0.005	mg/L	0.00102	0.0025	0.00108	0.00156	0.0018	0.00178
Barium		mg/L	0.109	0.102	0.091	0.158	0.124	0.109
Boron	0.2	mg/L	0.26	0.39	0.414	0.405	0.523	0.386
Cadmium	0.0001	mg/L	0.0000376	<0.000050	0.0000427	0.0000237	0.0000973	0.000125
Chloride		mg/L	32.8	45.3	37.1	50.6	36.3	36.3
Chromium		mg/L	0.00124	<0.0050	0.00114	0.00132	0.00369	0.00446
Conductivity		µS/cm	643	549	642	612	438	514
Copper	0.005	mg/L	0.0025	<0.0050	0.00353	0.00175	0.0076	0.0104
Iron	0.3	mg/L	22.3	23.8	14.6	18.8	28.9	43
Lead	0.001	mg/L	0.000554	0.00228	0.00143	0.000808	0.00368	0.005
Manganese		mg/L		0.0904		0.191	0.0736	0.00408
Manganese (Dissolved)			0.118	0.0506	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Mercury	0.0002	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Nitrate		mg/L	0.046	<0.010	0.051	<0.020	<0.020	0.153
Nitrite		mg/L	0.013	<0.020	<0.020	<0.010	<0.010	0.055
TKN		mg/L	14.8	24.7	11.9	8.45	7.09	12.7
pH	6.5-8.5	mg/L	8.14	8.30	8.08	7.91	7.56	8.21
Total Phosphorous	0.01	mg/L	0.215	0.187	0.148	0.161	0.223	0.236
Suspended Solids		mg/L	103	89	250	76.1	1180	379
TDS		mg/L	320	297	366	429	286	293
Sulfate		mg/L	<0.30	6.63	<0.60	<0.30	12	17.7
Zinc	0.02	mg/L	0.0173	<0.030	0.0142	0.0104	0.0381	0.0526
Zinc (Dissolved)			0.0022	<0.010	0.0016	0.0011	<0.0020	0.001
Other Organics								
BOD_5		mg/L	10.2	4.7	16.4	8.9	27	23.8
COD		mg/L	124	195	75	178	170	86
Phenols	0.001	mg/L	0.0017	0.003	0.0023	0.0028	0.0032	0.0019
DOC		mg/L	23.6	64.9	23.7	51.2	39.2	30.4
Field Parameters								
Temperature		°C	20.1	26.1	20.6	28.9	19	14.5
pH			7.23	7.6	7.35	7.65	7.42	8.07
Conductivity		mS/cm	0.705	0.645	0.674	0.593	0.462	0.498
Dissolved Oxygen		%	160.1	43.4	70.5	82.7	54.5	105.7

Shaded concentrations exceed PWQO
ND = Not Detected
NT = Not Tested

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.21: Sampling Location - SW5
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 3

KEC Project Ref. No. 2331

Parameter	PWQO	Units	Sampling Event		
			May-22	Sep-22	2023
Miscellaneous Parameters					NOT SAMPLED
					Location Filled
Nitrite (as N)		mg/L	<0.010	<0.010	
Bicarbonate (HCO3)		mg/L	168	365	
Carbonate (CO3)		mg/L	<2.0	11	
Hydroxide (OH)		mg/L	<2.0	<1.0	
Ion Balance Calculation					
Cation - Anion Balance		%	-2	-5	
TDS (calculated)		mg/L	213	424	
Anion Sum		me/L	3.82	7.84	
Cation Sum		me/L	3.67	7.13	
Inorganics					
Alkalinity		mg/L CaCO3	168	376	
Ammonia		mg/L	5.07	24.3	
Arsenic	0.005	mg/L	0.00106	0.0018	
Barium		mg/L	0.0736	0.127	
Boron	0.2	mg/L	0.177	0.36	
Cadmium	0.0001	mg/L	0.000053	<0.000050	
Chloride		mg/L	16.4	52.3	
Chromium		mg/L	0.00125	<0.0050	
Conductivity		µS/cm	379	666	
Copper	0.005	mg/L	0.003	<0.0050	
Iron	0.3	mg/L	11.1	16	
Lead	0.001	mg/L	0.00105	<0.00050	
Manganese		mg/L		0.544	
Manganese (Dissolved)		mg/L	0.285	0.517	
Mercury	0.0002	mg/L	<0.0000050	<0.0000050	
Nitrate		mg/L	<0.020	<0.010	
Nitrite		mg/L	<0.010	<0.020	
TKN		mg/L	6.22	37.6	
pH	6.5-8.5	mg/L	7.98	8.34	
Total Phosphorous	0.01	mg/L	0.106	0.265	
Suspended Solids		mg/L	84.8	40	
TDS		mg/L	213	434	
Sulfate		mg/L	0.33	3.26	
Zinc	0.02	mg/L	0.0091	<0.030	
Zinc (Dissolved)		mg/L	0.0014	<0.010	
Other Organics					
BOD_5		mg/L	6.7	4.9	
COD		mg/L	72	89	
Phenols	0.001	mg/L	0.0014	0.0065	
DOC		mg/L	15.2	30.2	
Field Parameters					
Temperature		°C	17	19.6	
pH			7.32	7.39	
Conductivity		mS/cm	0.456	0.906	
Dissolved Oxygen		%	94.8	38.8	

Shaded concentrations exceed PWQO
ND = Not Detected
NT = Not Tested

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.22: Sampling Location - SW6
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 3

KEC Project Ref. No. 2331

Parameter	PWQO	Units	Sampling Event					
			May-22	Sep-22	Jun-23	Aug-23	Sep-23	Oct-23
Miscellaneous Parameters							NOT SAMPLED	
Nitrite (as N)		mg/L	<0.010	<0.010	<0.010	<0.010	DRY	<0.010
Bicarbonate (HCO3)		mg/L	32.2	47.3	36.1	49.8		31
Carbonate (CO3)		mg/L	<2.0	<1.0	<2.0	<2.0		<2.0
Hydroxide (OH)		mg/L	<2.0	<1.0	<2.0	<2.0		<2.0
Ion Balance Calculation								
Cation - Anion Balance		%	4.3	13	5.94	5.26		-0.4
TDS (calculated)		mg/L	54	83	91	101		99
Anion Sum		me/L	0.66	0.88	0.87	1.08		1.24
Cation Sum		me/L	0.72	1.15	0.98	1.2		1.23
Inorganics								
Alkalinity		mg/L CaCO3	32.2	47.3	36.1	49.8		31
Ammonia		mg/L	0.0076	0.072	0.024	0.0259		0.0227
Arsenic	0.005	mg/L	0.0011	0.00249	0.001	0.00241		0.00092
Barium		mg/L	0.0131	0.0474	0.00964	0.0284		0.0113
Boron	0.2	mg/L	<0.010	0.015	0.018	0.029		0.022
Cadmium	0.0001	mg/L	0.0000205	0.0000718	0.0000161	0.0000558		0.0000055
Chloride		mg/L	0.44	1.27	<0.50	1.53		0.66
Chromium		mg/L	0.00071	0.00247	0.00057	0.00259		<0.00050
Conductivity		µS/cm	62	99.5	86.9	107		133
Copper	0.005	mg/L	0.0014	0.0023	0.00184	0.00168		0.00075
Iron	0.3	mg/L	1.39	2.18	0.414	2.63		0.246
Lead	0.001	mg/L	0.000357	0.00208	0.00028	0.00138		0.000182
Manganese		mg/L		1.43		0.134		0.0126
Manganese (Dissolved)		mg/L	0.0568	0.0887	<0.0000050	<0.0000050		<0.0000050
Mercury	0.0002	mg/L	<0.0000050	<0.0000050	<0.0000050	0.0000068		<0.0000050
Nitrate		mg/L	<0.020	<0.010	<0.020	<0.020		<0.020
Nitrite		mg/L	<0.010	<0.020	<0.010	<0.010		<0.010
TKN		mg/L	0.94	3.02	1.97	3.27		0.984
pH	6.5-8.5	mg/L	7.49	7.70	7.62	7.5		7.55
Total Phosphorous	0.01	mg/L	0.0822	0.202	0.068	0.271		0.0494
Suspended Solids		mg/L	13.8	18.2	3.7	148		15.4
TDS		mg/L	54	54.5	91	101		99
Sulfate		mg/L	<0.30	3.04	7.04	2.1		28.9
Zinc	0.02	mg/L	0.0041	0.0114	<0.0030	0.0094		<0.0030
Zinc (Dissolved)		mg/L	0.0022	0.0013	0.0024	0.0012		<0.0010
Other Organics								
BOD_5		mg/L	2.4	13.8	<2.0	6.6		<2.0
COD		mg/L	59	95	48	109		42
Phenols	0.001	mg/L	0.002	0.0015	0.0016	0.0038		<0.0010
DOC		mg/L	17	24.9	18.4	27.5		18.7
Field Parameters								
Temperature		°C	19.5	21.6	23.5	22.8		11.3
pH			7.01	6.77	6.53	7.96		8.1
Conductivity		mS/cm	0.072	0.114	0.093	0.192		0.157
Dissolved Oxygen		%	104.8	125	150.9	101.4		99.6

Shaded concentrations exceed PWQO
ND = Not Detected
NT = Not Tested

Town of Blind River Municipal Landfill Site
Ground and Surface Water Monitoring Results

TABLE G.23: Sampling Location - SW7
MECP Landfill Standards Guideline:
Schedule 5 Parameters, Column 3

KEC Project Ref. No. 2331

Parameter	PWQO	Units	Sampling Event					
			May-22	Sep-22	Jun-23	Aug-23	Sep-23	Oct-23
Miscellaneous Parameters								
Nitrite (as N)		mg/L	<0.050	<0.050	<0.010	<0.100	<0.200	<0.100
Bicarbonate (HCO3)		mg/L	167	107	85.3	136	84.7	65
Carbonate (CO3)		mg/L	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0
Hydroxide (OH)		mg/L	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0
Ion Balance Calculation								
Cation - Anion Balance		%	1.3	-2	1.83	-5.95	2.92	0.81
TDS (calculated)		mg/L	609	776	524	1220	919	834
Anion Sum		me/L	9.94	13.3	8.85	18.7	13.3	12.3
Cation Sum		me/L	10.2	12.8	9.18	16.6	14.1	12.5
Inorganics								
Alkalinity		mg/L CaCO3	167	107	85.3	136	84.7	65
Ammonia		mg/L	0.0202	0.05	0.073	0.126	0.0338	0.0405
Arsenic	0.005	mg/L	0.00064	0.00106	0.00248	0.00584	0.00469	0.00046
Barium		mg/L	0.0589	0.0753	0.116	0.264	0.236	0.094
Boron	0.2	mg/L	0.034	0.053	0.042	<0.100	0.087	0.051
Cadmium	0.0001	mg/L	0.0000437	0.0000094	0.000105	0.000434	0.000373	0.0000129
Chloride		mg/L	231	404	244	566	394	345
Chromium		mg/L	0.00116	0.00155	0.00314	0.0275	0.0172	0.00119
Conductivity		µS/cm	1100	1280	926	2010	1430	1430
Copper	0.005	mg/L	0.0019	0.0017	0.00698	0.0347	0.0224	0.0013
Iron	0.3	mg/L	5.83	4.18	28.6	40.4	69.1	3.76
Lead	0.001	mg/L	0.000381	0.000452	0.00118	0.0125	0.00749	0.000371
Manganese		mg/L		0.295		0.767	1.32	0.672
Manganese (Dissolved)		mg/L	0.248	0.201	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Mercury	0.0002	mg/L	<0.0000050	<0.0000050	<0.0000050	0.0000296	0.000074	<0.0000050
Nitrate		mg/L	<0.10	<0.050	<0.020	<0.200	<0.400	<0.200
Nitrite		mg/L	<0.050	<0.10	<0.010	<0.100	<0.200	<0.100
TKN		mg/L	1.47	4.4	2	9.04	5.68	0.66
pH	6.5-8.5	mg/L	8.01	7.67	7.31	6.97	6.87	7.84
Total Phosphorous	0.01	mg/L	0.109	0.521	0.369	0.846	1.19	0.0622
Suspended Solids		mg/L	97	271	1530	7300	6180	27.6
TDS		mg/L	609	749	524	1220	919	834
Sulfate		mg/L	5.1	6	12.8	<3.00	23.8	59.8
Zinc	0.02	mg/L	0.0156	0.0075	0.064	0.14	0.21	0.0145
Zinc (Dissolved)		mg/L	0.005	0.0014	0.009	0.0011	0.0029	0.0066
Other Organics								
BOD_5		mg/L	7.8	12.5	37.9	80.6	70.9	<3.0
COD		mg/L	66	152	48	401	287	26
Phenols	0.001	mg/L	0.0013	0.0015	<0.0010	0.0031	0.0028	<0.0010
DOC		mg/L	16.7	17.6	13.8	37.2	19.7	8.74
Field Parameters								
Temperature		°C	17.5	23	16.6	25.7	19.9	14.2
pH			7.74	8.45	7.38	7	6.76	7.83
Conductivity		mS/cm	1.188	0.704	0.958	1.815	1.28	1.237
Dissolved Oxygen		%	105.1	170.6	39.8	77.7	30.1	104.9

Shaded concentrations exceed PWQO
ND = Not Detected
NT = Not Tested

TABLE G.24: Observed Water Table Elevations

Aspect	MW1-02																																							
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.439	199.614	199.61	199.618	199.622	199.627	199.628	199.621	199.628
Well stick-up	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.905	0.901	0.909	0.913	0.918	0.919	0.912	0.919
Ground elevation	198.529	198.529	198.529	198.529	198.529	198.529	198.529	198.529	198.529	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709	198.709
Observed depth to water table from top of casing	2.26	1	1.135	4.045	3.05	1.715	1.065	1.12	1.18	1.03	2.877	1.084	1.161	1.392	1.231	1.064	2.467	1.401	3.225	1.103	1.144	1.101	1.15	1.16	2.369	1.167	3.012	1.099	1.095	1.095	1.233	1.198	1.312	1.072	1.148	1.575	1.17	2.621	1.364	3.328
Depth to termination of well screen	4.26	5.71	5.204	5.205	5.2	5.205	5.21	5.205	5.2	5.2	5.208	5.205	5.212	4.875	5.206	5.203	5.207	5.214	5.204	5.205	5.214	5.208	5.21	4.21	5.21	5.212	5.211	5.21	5.209	5.209	5.205	5.205	5.208	5.207	5.206	5.203	5.204	5.204	5.205	5.204
Approx. elevation of screen termination	195.179	193.729	194.235	194.234	194.239	194.234	194.229	194.234	194.239	194.239	194.231	194.234	194.227	194.564	194.233	194.236	194.232	194.225	194.235	194.234	194.225	194.231	194.229	195.229	194.229	194.227	194.228	194.229	194.23	194.23	194.234	194.234	194.406	194.403	194.412	194.419	194.423	194.424	194.416	194.424
Approx. Water Table Elevation	**197.179**	**198.439**	**198.304**	**195.394**	**196.389**	**197.724**	**198.374**	**198.319**	**198.259**	**198.409**	**196.562**	**198.355**	**198.278**	**198.047**	**198.208**	**198.375**	**196.972**	**198.038**	**196.214**	**198.336**	**198.295**	**198.338**	**198.289**	**198.279**	**197.070**	**198.272**	**196.427**	**198.340**	**198.344**	**198.344**	**198.206**	**198.241**	**198.302**	**198.538**	**198.470**	**198.047**	**198.457**	**197.007**	**198.257**	**196.300**

Aspect	MW2-02																																							
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	201.078	200.852	200.842	200.855	200.864	200.887	200.887	200.849	200.87
Well stick-up	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.684	0.674	0.687	0.696	0.719	0.719	0.681	0.702
Ground elevation	200.218	200.218	200.218	200.218	200.218	200.218	200.218	200.218	200.218	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168	200.168
Observed depth to water table from top of casing	2.44	2	2.45	4.04	2.63	2.5	2.41	2.429	2.582	2.284	2.609	2.324	2.511	2.635	2.318	2.463	2.519	2.592	2.661	2.339	2.3	3.62	2.37	2.48	2.503	2.228	2.463	2.201	2.259	2.194	2.254	2.413	2.439	2.053	2.266	2.292	2.269	2.385	2.263	2.484
Depth to termination of well screen	6.09	NA	6.665	6.57	6.605	6.61	6.63	6.622	6.607	6.611	6.621	6.612	6.612	6.613	6.614	6.607	6.617	6.609	6.62	6.596	6.627	6.62	6.61	6.63	6.598	6.409	6.413	6.412	6.411	6.406	6.407	6.404	6.405	6.415	6.405	6.41	6.405	6.409	6.404	6.405
Approx. elevation of screen termination	194.988		194.413	194.508	194.473	194.468	194.448	194.456	194.471	194.467	194.457	194.466	194.466	194.465	194.464	194.471	194.461	194.469	194.458	194.482	194.451	194.458	194.468	194.448	194.48	194.669	194.665	194.666	194.667	194.672	194.671	194.674	194.447	194.427	194.45	194.454	194.482	194.478	194.445	194.465
Approx. Water Table Elevation	**198.638**	**NA**	**198.628**	**197.038**	**198.448**	**198.578**	**198.668**	**198.649**	**198.496**	**198.794**	**198.469**	**198.754**	**198.567**	**198.443**	**198.76**	**198.615**	**198.559**	**198.486**	**198.417**	**198.739**	**198.778**	**197.458**	**198.708**	**198.598**	**198.575**	**198.850**	**198.615**	**198.877**	**198.819**	**198.884**	**198.824**	**198.665**	**198.413**	**198.789**	**198.589**	**198.572**	**198.618**	**198.502**	**198.586**	**198.386**

Aspect	MW3-02																																							
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	192.104	Frozen	191.518	191.507	191.528	191.506	191.434	191.521	191.495	191.494
Well stick-up	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	Tubing	0.935	0.924	0.945	0.923	0.851	0.938	0.912	0.911
Ground elevation	191.194	191.194	191.194	191.194	191.194	191.194	191.194	191.194	191.194	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	191.192	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583
Observed depth to water table from top of casing	NT	NT	1.13	0.9	1.25	1.18	1.025	1.62	1.043	1.052	1.15	1.091	1.069	1.133	1.058	1.013	1.029	1.064	1.138	1.028	0.984	1.555	1.13	1.15	1.094	0.922	0.974	0.933	0.918	0.919	1.036		0.964	0.97	0.946	0.941	0.955	1.169	0.991	1.089
Depth to termination of well screen			2.1	1.82	1.85	1.83	1.78	1.83	1.816	1.823	1.695	1.701	1.706	1.735	1.762	1.815	1.769	1.736	1.798	1.815	1.792	1.814	1.81	1.9	1.902	1.764	1.764	1.751	1.724	1.729	1.723		1.732	1.729	1.72	1.728	1.738	1.739	1.738	1.738
Approx. elevation of screen termination			186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313		186.313	186.313	186.313	186.313	186.313	186.313	186.313	186.313
Approx. Water Table Elevation	**NT**	**NT**	**190.974**	**191.204**	**189.944**	**190.924**	**191.079**	**190.484**	**191.061**	**191.052**	**190.954**	**191.013**	**191.035**	**190.971**	**191.046**	**191.091**	**191.075**	**191.04**	**190.966**	**191.076**	**191.12**	**190.549**	**190.974**	**190.954**	**191.01**	**191.182**	**191.13**	**191.171**	**191.186**	**191.185**	**191.068**		**190.554**	**190.537**	**190.582**	**190.565**	**190.479**	**190.352**	**190.504**	**190.405**

Aspect	MW4-02																																							
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.266	192.206	192.174	192.226	192.226	192.208	192.222	192.186
Well stick-up	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	Frozen	0.772	0.78	0.748	0.8	0.8	0.782	0.796	0.76
Ground elevation	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426	191.426
Observed depth to water table from top of casing	1.42	0.85	1.185	3.24	1.31	1.12	1.09	0.61	1.132	1.024	1.252	1.069	1.137	1.119	1.114	0.993	1.098	1.121	1.168	1.03	1.062	1.152	1.14	1.13	1.143	0.971	1.013	0.897	0.876	0.892	1.048		0.978	0.914	0.992	1.023	1.023	1.225	1.055	1.229
Depth to termination of well screen	4.57	5.87	5.1	4.335	5.115	5.1	5.1	5.109	5.112	5.121	5.109	5.112	5.116	5.12	5.109	5.11	5.092	5.092	5.112	5.108	5.099	5.097	5.1	5.11	5.112	4.966	4.962	4.97	4.959	4.973	4.965		4.968	4.969	4.964	4.966	4.966	4.967	4.97	4.971
Approx. elevation of screen termination	187.696	186.396	187.166	187.931	187.151	187.166	187.166	187.157	187.154	187.145	187.157	187.154	187.15	187.146	187.157	187.156	187.174	187.174	187.154	187.158	187.167	187.169	187.166	187.156	187.154	187.3	187.304	187.296	187.307	187.293	187.301		187.23	187.237	187.21	187.26	187.26	187.241	187.252	187.215
Approx. Water Table Elevation	**190.846**	**191.416**	**191.081**	**189.026**	**190.956**	**191.146**	**191.176**	**191.656**	**191.134**	**191.242**	**191.014**	**191.197**	**191.129**	**191.147**	**191.152**	**191.273**	**191.168**	**191.145**	**191.098**	**191.236**	**191.204**	**191.114**	**191.126**	**191.136**	**191.123**	**191.295**	**191.253**	**191.369**	**191.39**	**191.374**	**191.218**		**191.220**	**191.292**	**191.182**	**191.203**	**191.203**	**190.983**	**191.167**	**190.957**

Aspect	MW5-02																																							
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.156	198.16	198.163	198.15	198.158	198.159	198.172	198.171	198.171
Well stick-up	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.784	0.787	0.774	0.782	0.783	0.796	0.795	0.795
Ground elevation	197.336	197.336	197.336	197.336	197.336	197.336	197.336	197.336	197.336	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376	197.376
Observed depth to water table from top of casing	1.27	1.21	0.825	3.505	1.13	0.95	0.84	0.8	0.95	0.73	0.985	0.856	1.005	0.85	1.053	1.106	0.837	1.054	0.944	1.012	0.755	0.68	0.91	1.12	1.336	0.986	1.388	1.053	1.174	1.039	1.018	1.102	1.049	1.015	1.032	1.182	1.103	1.356	1.125	1.329
Depth to termination of well screen	3.96	4.86	4.625	4.62	4.615	4.625	4.63	4.62	4.62	4.63	4.63	4.625	4.625	4.625	4.63	4.625	4.626	4.631	4.626	4.626	4.026	4.621	4.63	3.8	4.489	4.632	4.626	4.63	4.628	4.627	4.624	4.624	4.625	4.625	4.623	4.62	4.624	4.63	4.626	4.622
Approx. elevation of screen termination	194.196	193.296	193.531	193.536	193.541	193.531	193.526	193.536	193.536	193.526	193.526	193.531	193.531	193.531	193.526	193.531	193.53	193.525	193.53	193.53	194.13	193.535	193.526	194.356	193.667	193.524	193.53	193.526	193.528	193.529	193.532	193.532	193.535	193.538	193.527	193.538	193.535	193.542	193.545	193.549
Approx. Water Table Elevation	**196.886**	**196.946**	**197.331**	**194.651**	**197.026**	**197.206**	**197.316**	**197.356**	**197.206**	**197.426**	**197.171**	**197.3**	**197.151**	**197.306**	**197.103**	**197.05**	**197.319**	**197.102**	**197.212**	**197.144**	**197.401**	**197.476**	**197.246**	**197.036**	**196.82**	**197.17**	**196.768**	**197.103**	**196.982**	**197.117**	**197.138**	**197.054**	**197.111**	**197.148**	**197.118**	**196.976**	**197.056**	**196.816**	**197.046**	**196.842**

Aspect	MW6-02																																							
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.965	191.996	191.997	192.005	191.998	191.927	192.004	192.013	192.003
Well stick-up	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.788	0.789	0.797	0.79	0.719	0.796	0.805	0.795
Ground elevation	191.055	191.055	191.055	191.055	191.055	191.055	191.055	191.055	191.055	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208	191.208
Observed depth to water table from top of casing	1.8	1.12	1.9	6.1	1.75	1.39	1.315	1.239	1.398	1.128	1.495	1.306	1.351	1.39	1.319	1.199	1.421	1.294	1.534	1.214	1.106	1.17	1.26	1.3	1.446	1.044	1.264	1.05	1.175	1.055	1.407	1.22	1.165	1.073	1.164	1.219	1.164	1.356	1.324	1.589
Depth to termination of well screen	7.01	7.56	7.576	7.56	7.565	7.505	7.57	7.575	7.578	7.58	7.58	7.571	7.569	7.29	7.568	7.575	7.581	7.571	7.569	7.562	7.574	7.571	7.58	6.54	7.576	7.437	7.43	7.441	7.435	7.429	7.428	7.429	7.436	7.427	7.426	7.428	7.185	7.428	7.43	7.435
Approx. elevation of screen termination	184.955	184.405	184.389	184.405	184.4	184.46	184.395	184.39	184.387	184.385	184.385	184.394	184.396	184.675	184.397	184.39	184.384	184.394	184.396	184.403	184.391	184.394	184.385	185.425	184.389	184.528	184.535	184.524	184.53	184.536	184.537	184.536	184.56	184.57	184.579	184.57	184.742	184.576	184.583	184.568
Approx. Water Table Elevation	**190.165**	**190.845**	**190.065**	**185.865**	**190.215**	**190.575**	**190.2**	**190.726**	**190.567**	**190.837**	**190.470**	**190.659**	**190.614**	**190.575**	**190.646**	**190.766**	**190.544**	**190.671**	**190.431**	**190.751**	**190.859**	**190.795**	**190.705**	**190.665**	**190.519**	**190.921**	**190.701**	**190.915**	**190.79**	**190.91**	**190.558**	**190.745**	**190.831**	**190.924**	**190.841**	**190.779**	**190.763**	**190.648**	**190.689**	**190.414**

Aspect	MW1-03																																				
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation		191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	191.563	Frozen	191.609	191.606	191.61	191.635	191.573	191.62	191.6	191.621
Well stick-up		0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	Tubing	1.026	1.023	1.027	1.052	0.99	1.037	1.017	1.038
Ground elevation		190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583		190.583	190.583	190.583	190.583	190.583	190.583	190.583	190.583
Observed depth to water table from top of casing		1.95	1.015	2.395	1.253	1.15	1.02	1.049	1.018	1.035	1.08	1.057	1.4	1.6	1.011	1.014	1.039	1.111	1.169	1.028	1.029	1.039	1.2	1.02	1.072	1.032	1.054	1.025	1.018	1.034	1.037		1.027	0.992	1.038	1.008	1.055	1.255	1.048	1.222
Depth to termination of well screen		4.92	3.315	3.475	3.47	3.54	3.53	3.516	3.502	3.446	3.53	3.529	3.509	3.22	3.51	3.539	3.541	3.542	3.542	3.539	3.54	3.525	3.53	3.54	3.541	3.541	3.535	3.529	3.523	3.523	3.514		3.51	3.511	3.505	3.501	305	3.504	3.49	3.495
Approx. elevation of screen termination		186.643	188.248	188.088	188.093	188.023	188.033	188.047	188.061	188.117	188.033	188.034	188.054	188.343	188.053	188.024	188.022	188.021	188.021	188.024	188.023	188.038	188.033	188.023	188.022	188.022	188.028	188.034	188.04	188.04	188.049		188.099	188.095	188.105	188.134	-113.427	188.116	188.11	188.126
Approx. Water Table Elevation		**189.78**	**190.715**	**189.335**	**190.477**	**190.58**	**190.71**	**190.514**	**190.545**	**190.528**	**190.483**	**190.506**	**190.163**	**189.963**	**190.552**	**190.549**	**190.524**	**190.452**	**190.394**	**190.535**	**190.534**	**190.524**	**190.363**	**190.543**	**190.491**	**190.531**	**190.509**	**190.538**	**190.545**	**190.529**	**190.526**		**190.582**	**190.614**	**190.572**	**190.627**	**190.518**	**190.365**	**190.552**	**190.399**

Aspect	MW1-15																																				
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Dec-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation																									200.574	200.574	200.574	200.574	200.574	200.574	200.574	200.574	200.584	200.575	200.552	200.558	200.579	200.582	200.577	200.577
Well stick-up																									0.849	0.849	0.849	0.849	0.849	0.849	0.849	0.849	0.859	0.85	0.827	0.833	0.854	0.857	0.852	0.852
Ground elevation																									199.725	199.725	199.725	199.725	199.725	199.725	199.725	199.725	199.725	199.725	199.725	199.725	199.725	199.725	199.725	199.725
Observed depth to water table from top of casing																									2.654	2.461	2.697	2.363	2.422	2.361	2.568	2.508	2.469	2.384	2.421	2.559	2.358	2.612	2.406	2.663
Depth to termination of well screen																									6.798	6.777	6.751	6.738	6.745	6.725	6.454	6.761	6.744	6.721	6.729	6.709	6.7	6.745	6.728	6.467
Approx. elevation of screen termination																									193.776	193.797	193.823	193.836	193.829	193.849	194.12	193.813	193.84	193.854	193.823	193.849	193.879	193.837	193.849	194.11
Approx. Water Table Elevation																									**197.92**	**198.113**	**197.877**	**198.211**	**198.152**	**198.213**	**198.006**	**198.066**	**198.115**	**198.191**	**198.131**	**197.999**	**198.221**	**197.970**	**198.171**	**197.914**

Aspect	MW2-15																																				
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Dec-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation																									198.815	198.815	198.815	198.815	198.815	198.815	198.815	198.815	198.802	198.802	198.794	198.761	198.766	198.754	198.765	198.753
Well stick-up																									1.096	1.096	1.096	1.096	1.096	1.096	1.096	1.096	1.083	1.083	1.075	1.042	1.047	1.035	1.046	1.034
Ground elevation																									197.719	197.719	197.719	197.719	197.719	197.719	197.719	197.719	197.719	197.719	197.719	197.719	197.719	197.719	197.719	197.719
Observed depth to water table from top of casing																									1.707	2.776	2.661	2.456	1.698	1.968	1.878	2.093	2.342	1.789	1.992	1.944	2.122	2.985	2.473	DRY
Depth to termination of well screen																									3.798	3.013	3.013	3.004	3.012	3.019	3.007	3.006	3.011	3.009	3.011	3.105	3.011	3.01	3.007	3.008
Approx. elevation of screen termination																									195.017	195.802	195.802	195.811	195.803	195.796	195.808	195.809	195.791	195.793	195.783	195.656	195.755	195.744	195.758	195.745
Approx. Water Table Elevation																									**197.108**	**196.039**	**196.154**	**196.359**	**197.117**	**196.847**	**196.937**	**196.722**	**196.460**	**197.013**	**196.802**	**196.817**	**196.644**	**195.769**	**196.292**	**NA**

Aspect	MW3-15																																				
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Dec-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation																									199.262	199.262	199.262	199.262	199.262	199.262	199.262	199.262	199.299	199.299	199.288	199.302	199.312	199.292	199.297	199.281
Well stick-up																									0.715	0.715	0.715	0.715	0.715	0.715	0.715	0.715	0.752	0.752	0.741	0.755	0.765	0.745	0.750	0.734
Ground elevation																									198.547	198.547	198.547	198.547	198.547	198.547	198.547	198.547	198.547	198.547	198.547	198.547	198.547	198.547	198.547	198.547
Observed depth to water table from top of casing																									2.142	2.444	3.186	2.018	2.006	2.079	2.648	2.591	2.514	2.219	2.241	3.04	2.425	3.426	2.615	3.553
Depth to termination of well screen																									5.165	5.16	5.218	5.242	5.229	5.199	5.178	5.189	5.223	5.212	5.21	5.206	5.248	5.245	5.246	5.245
Approx. elevation of screen termination																									194.097	194.102	194.044	194.02	194.033	194.063	194.084	194.073	194.076	194.087	194.078	194.096	194.064	194.047	194.051	194.036
Approx. Water Table Elevation																									**197.12**	**196.818**	**196.076**	**197.244**	**197.256**	**197.183**	**196.614**	**196.671**	**196.785**	**197.08**	**197.047**	**196.262**	**196.887**	**195.866**	**196.682**	**195.728**

Aspect	MW4-15																																				
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Dec-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation																									204.412	204.412	204.412	204.412	204.412	204.412	204.412	204.412	204.417	204.412	204.382	204.382	204.390	204.423	204.400	204.329
Well stick-up																									0.832	0.832	0.832	0.832	0.832	0.832	0.832	0.832	0.837	0.832	0.802	0.802	0.810	0.843	0.820	0.749
Ground elevation																									203.58	203.58	203.58	203.58	203.58	203.58	203.58	203.58	203.58	203.58	203.58	203.58	203.58	203.58	203.58	203.58
Observed depth to water table from top of casing																									2.697	2.646	3.361	2.519	2.464	2.421	2.703	2.629	2.638	2.395	2.441	3.001	2.442	3.359	2.682	3.585
Depth to termination of well screen																									5.486	5.547	5.425	5.454	5.413	5.425	5.417	5.421	5.421	5.426	5.416	5.415	5.437	5.463	5.464	4.88
Approx. elevation of screen termination																									198.926	198.865	198.987	198.958	198.999	198.987	198.995	198.991	198.996	198.986	198.966	198.967	198.953	198.96	198.936	199.449
Approx. Water Table Elevation																									**201.715**	**201.766**	**201.051**	**201.893**	**201.948**	**201.991**	**201.709**	**201.783**	**201.779**	**202.017**	**201.941**	**201.381**	**201.948**	**201.064**	**201.718**	**200.744**

Aspect	MW1-17																																				
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Dec-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation																												199.849	199.849	199.849	199.849	199.856	199.865	199.866	199.897	199.877	199.887	199.908	199.918
Well stick-up																												0.815	0.815	0.815	0.815	0.822	0.831	0.832	0.863	0.843	0.853	0.874	0.884
Ground elevation																												199.034	199.034	199.034	199.034	199.034	199.034	199.034	199.034	199.034	199.034	199.034	199.034
Observed depth to water table from top of casing																												1.352	1.378	1.773	1.774	1.825	1.495	1.575	1.96	1.642	2.196	1.675	2.202
Depth to termination of well screen																												3.059	3.059	3.036	3.051	3.059	3.058	3.054	3.056	3.085	3.058	3.052	3.058
Approx. elevation of screen termination																												196.79	196.79	196.813	196.798	196.797	196.807	196.812	196.841	196.792	196.829	196.856	196.86
Approx. Water Table Elevation																												**198.497**	**198.471**	**198.076**	**198.075**	**198.031**	**198.37**	**198.291**	**197.937**	**198.235**	**197.691**	**198.233**	**197.716**

Aspect	MW2-17																																				
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Dec-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation																												194.814	194.814	194.814	194.814	194.802	194.788	194.789	194.798	194.799	194.791	194.786	194.786
Well stick-up																												0.78	0.78	0.780	0.780	0.768	0.754	0.755	0.764	0.765	0.757	0.752	0.752
Ground elevation																												194.034	194.034	194.034	194.034	194.034	194.034	194.034	194.034	194.034	194.034	194.034	194.034
Observed depth to water table from top of casing																												1.612	1.755	1.914	1.907	1.983	1.744	1.879	2.051	1.988	2.299	1.966	2.3
Depth to termination of well screen																												5.264	5.257	5.221	5.209	5.211	5.193	5.175	5.173	5.165	5.177	5.161	5.147
Approx. elevation of screen termination																												189.55	189.557	189.593	189.605	189.591	189.595	189.614	189.625	189.634	189.614	189.625	189.639
Approx. Water Table Elevation																												**193.202**	**193.059**	**192.9**	**192.907**	**192.819**	**193.044**	**192.91**	**192.747**	**192.811**	**192.492**	**192.82**	**192.486**

Aspect	MW1-20																																					
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Dec-15	Jun-16	Oct-16	May-17	Nov-17	May-18	Nov-18	Feb-20	Jun-20	Nov-20	May-21	Oct-21	May-22	Sep-22	Jun-23	Oct-23
Top of casing elevation																																	194.864	194.88	194.872	194.889	194.884	194.906	194.915
Well stick-up																																	0.830	0.846	0.838	0.855	0.850	0.872	0.881
Ground elevation																																	194.034	194.034	194.034	194.034	194.034	194.034	194.034
Observed depth to water table from top of casing																																	1.251	1.333	1.534	1.468	1.713	1.493	1.759
Depth to termination of well screen																																	8.282	8.425	8.378	8.349	8.399	8.366	8.325
Approx. elevation of screen termination																																	186.582	186.455	186.494	186.54	186.485	186.54	186.59
Approx. Water Table Elevation																																	**193.613**	**193.547**	**193.338**	**193.421**	**193.171**	**193.413**	**193.156**

Aspect	MW2-03																																					
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15														
Top of casing elevation		198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475	198.475													
Well stick-up		0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.875													
Ground elevation		197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6	197.6													
Observed depth to water table from top of casing		1.26	NA	1.24	Dry Well	2.85	1.545	1.71	1.478	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Dry Well	Well Decommissioned												
Depth to termination of well screen		3.6		3.045		3.05	3.05	3.043	3.04			3.037	3.039	3.039	3.037	2.935																							
Approx. elevation of screen termination		194.875		195.43		195.425	195.425	195.432	195.435			195.438	195.436	195.436	195.438	195.54																							
Approx. Water Table Elevation		**197.215**	**NA**	**197.235**	**Dry Well**	**195.625**	**196.93**	**196.765**	**196.997**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**	**Dry Well**														

Aspect	MW3-03																																					
	2002	Mar-04	Nov-04	May-05	Oct-05	Jun-06	Dec-06	May-07	Oct-07	May-08	Oct-08	Jun-09	Oct-09	May-10	Oct-10	May-11	Sep-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15														
Top of casing elevation		199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3	199.3													
Well stick-up		0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927	0.927													
Ground elevation		198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373	198.373													
Observed depth to water table from top of casing		1	NT	2.37	3.595	2.925	2.5	2.465	2.672	2.194	3.393	2.386	3.051	2.9	2.632	2.325	3.163	NA	3.469	4.26	2.516		2.21	2.38	2.725	Well Decommissioned													
Depth to termination of well screen		NA		4.95	4.94	5.52	5.23	5.244	5.204	5.212	5.172	5.194	5.208	5.2	5.2	5.244	5.253	5.213	5.132	5.247	5.185		5.17	5.18	5.21													
Approx. elevation of screen termination				194.35	194.36	193.78	194.07	194.056	194.096	194.088	194.128	194.106	194.092	194.1	194.1	194.056	194.047	194.087	194.168	194.053	194.115	199.3	194.13	194.12	194.09													
Approx. Water Table Elevation		**NA**	**NT**	**196.93**	**195.705**	**196.375**	**196.8**	**196.835**	**196.628**	**197.106**	**195.907**	**196.914**	**196.249**	**196.4**	**196.668**	**196.975**	**196.137**	**NA**	**195.831**	**195.04**	**196.784**	**199.3**	**197.09**	**196.92**	**196.575**													

All measurements and distances in meters
NA - not available
NT - not tested

Appendix H
Water Quality Data Trends

Groundwater Quality Trends

Charts H.1-H.6 plot annual concentrations (2 samples per year) of selected parameters at certain groundwater sampling locations. No statistically significant trends appear evident in the data associated with the above mentioned monitoring wells. Reasonable Use Criteria shown on the plots are developed using median background concentrations based on the entire data set associated with MW1-02.

Chart H.1
Town of Blind River Municipal Landfill Site
Alkalinity Concentration Trending

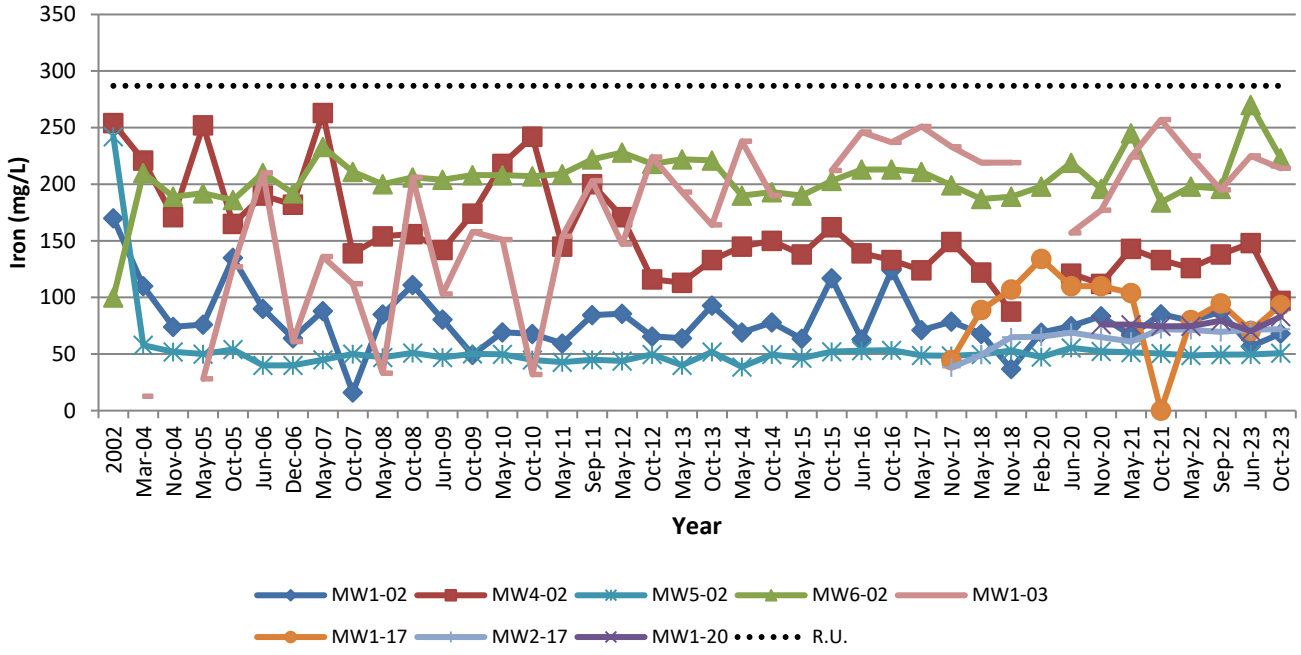


Chart H.2
Town of Blind River Municipal Landfill Site
Iron Concentration Trending

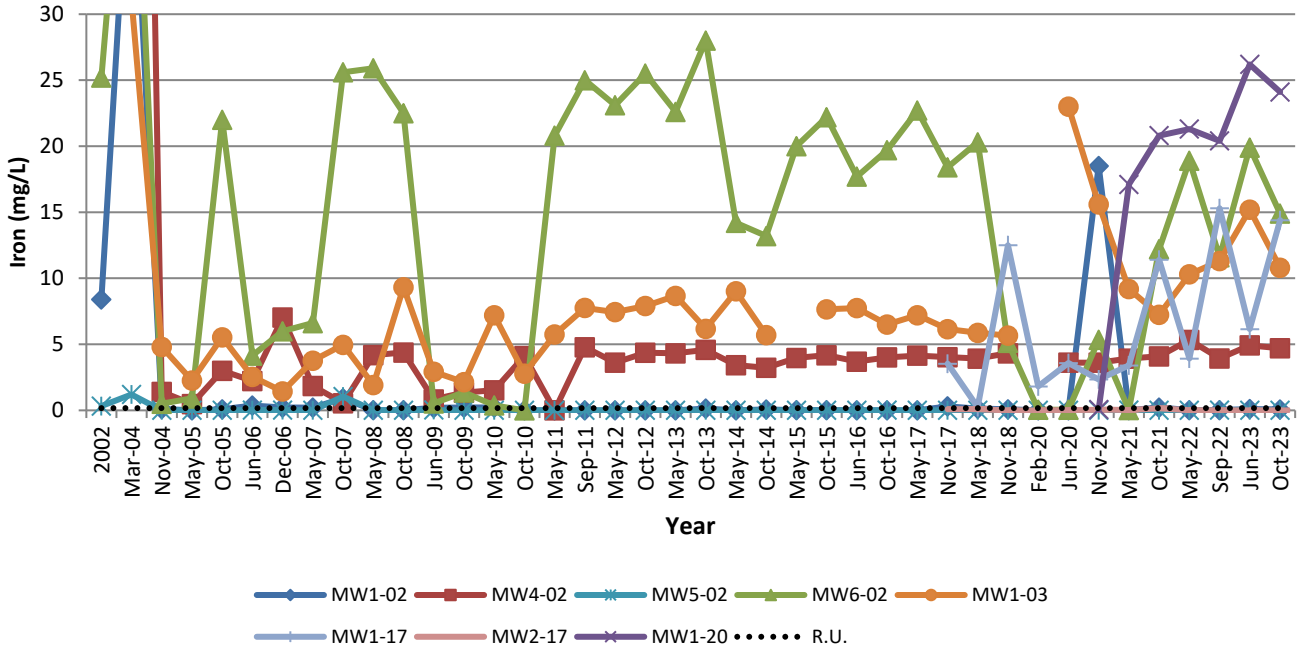


Chart H.3
Town of Blind River Municipal Landfill Site
Manganese Concentration Trending

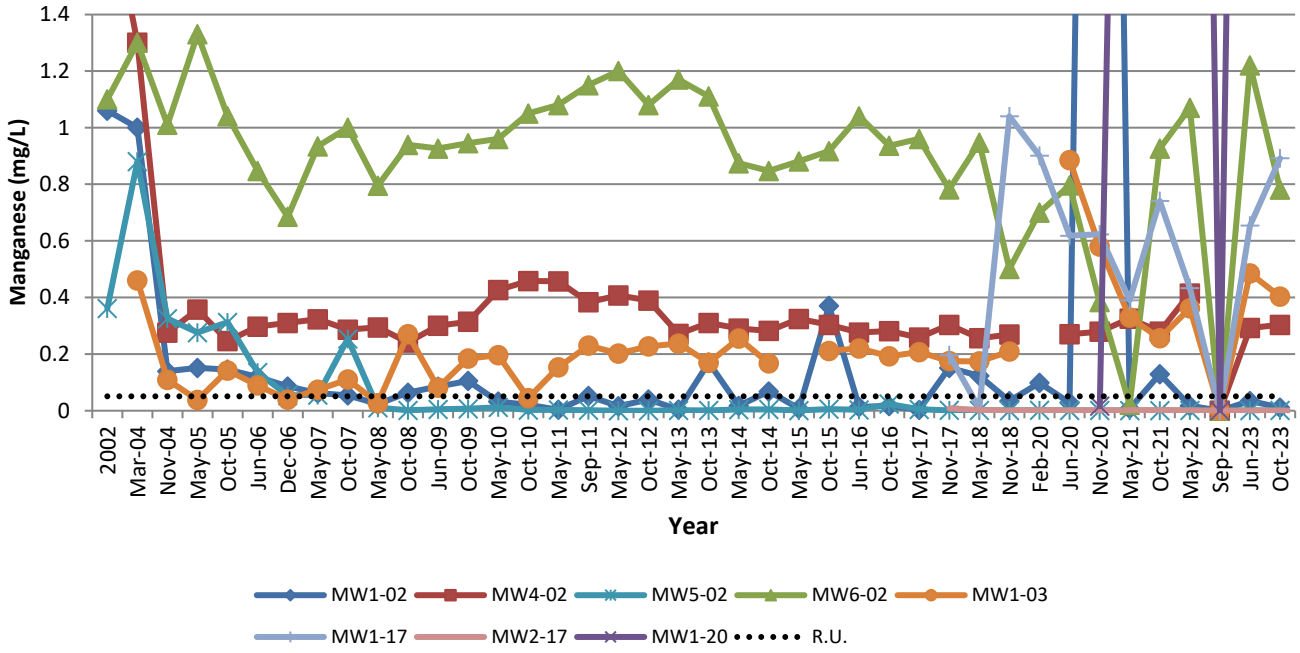


Chart H.4
Town of Blind River Municipal Landfill Site
DOC Concentration Trending

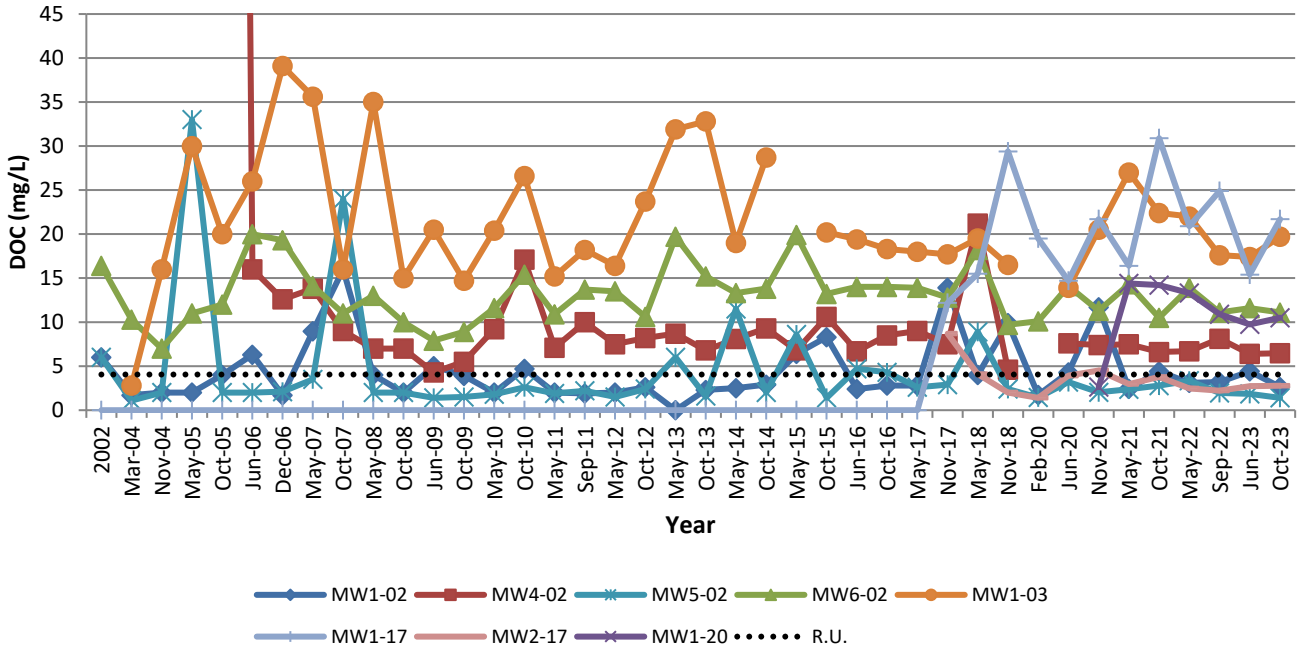


Chart H.5
Town of Blind River Municipal Landfill Site
TDS Concentration Trending

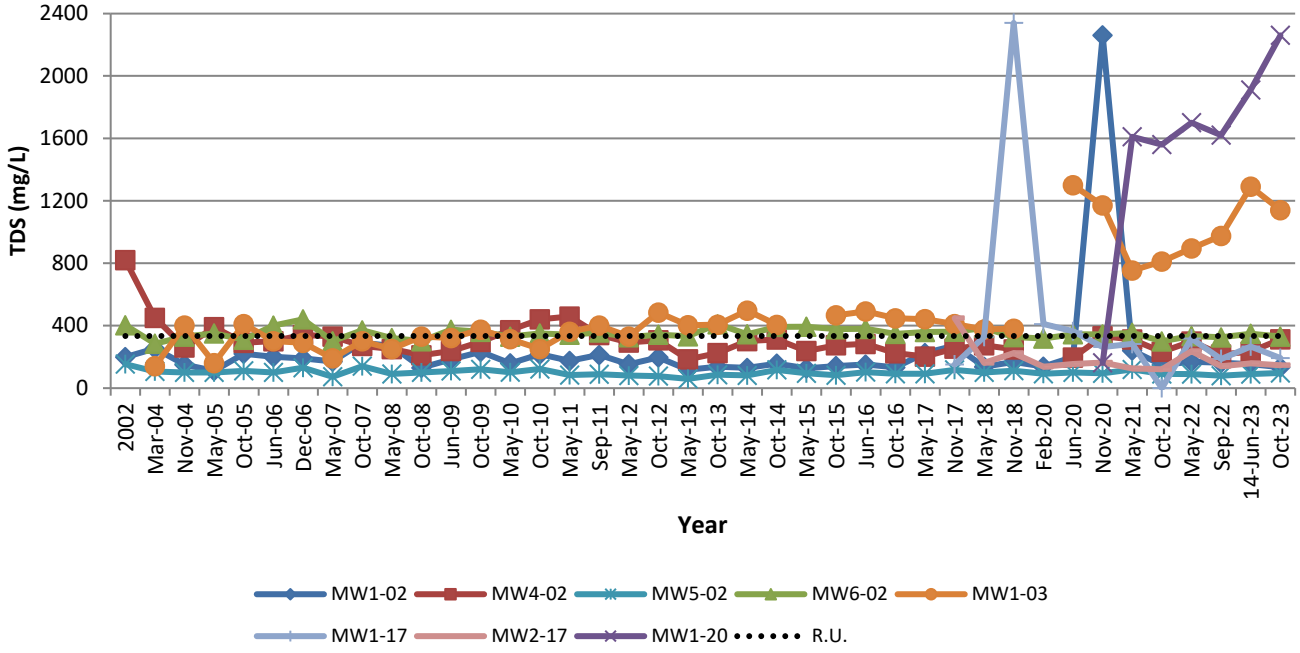
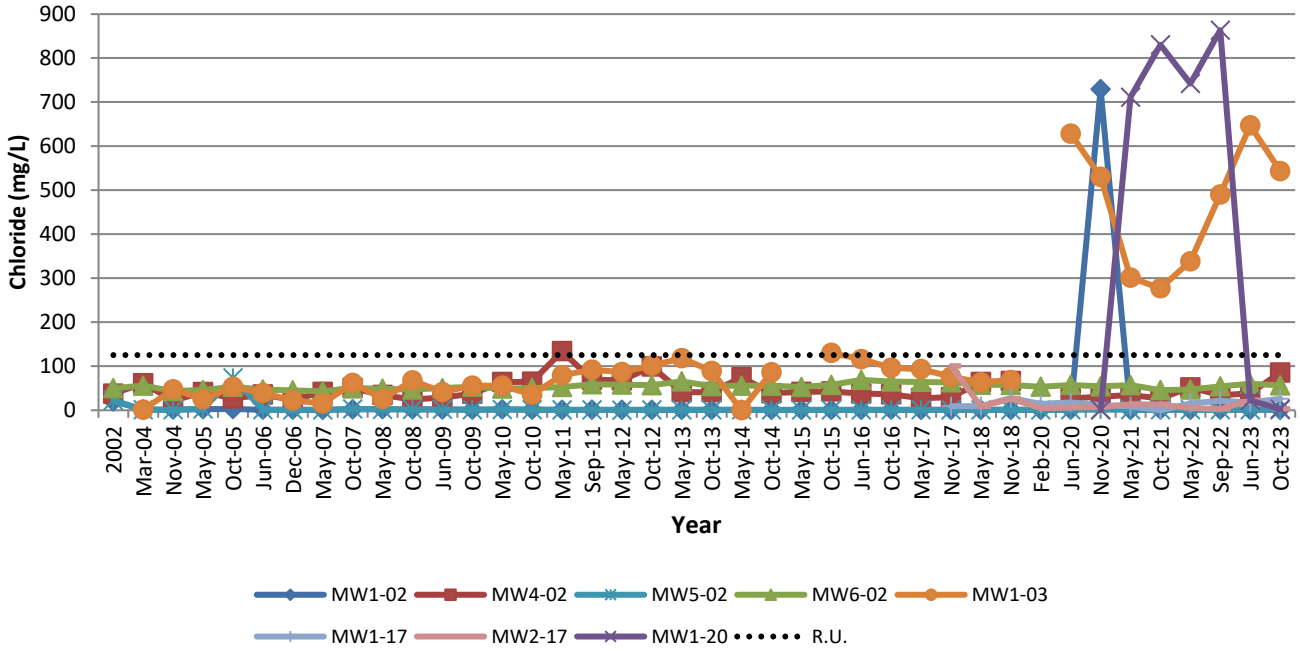


Chart H.6
Town of Blind River Municipal Landfill Site
Chloride Concentration Trending



Surface Water Quality Trending

Charts H.7 - H.10 plot annual concentrations (2 samples per year) of selected parameters at the surface water sampling location. No statistically significant trends appear evident in the data associated with the above-mentioned sampling location.

Chart H.7
Town of Blind River Municipal Landfill Site
Iron Concentration Trending

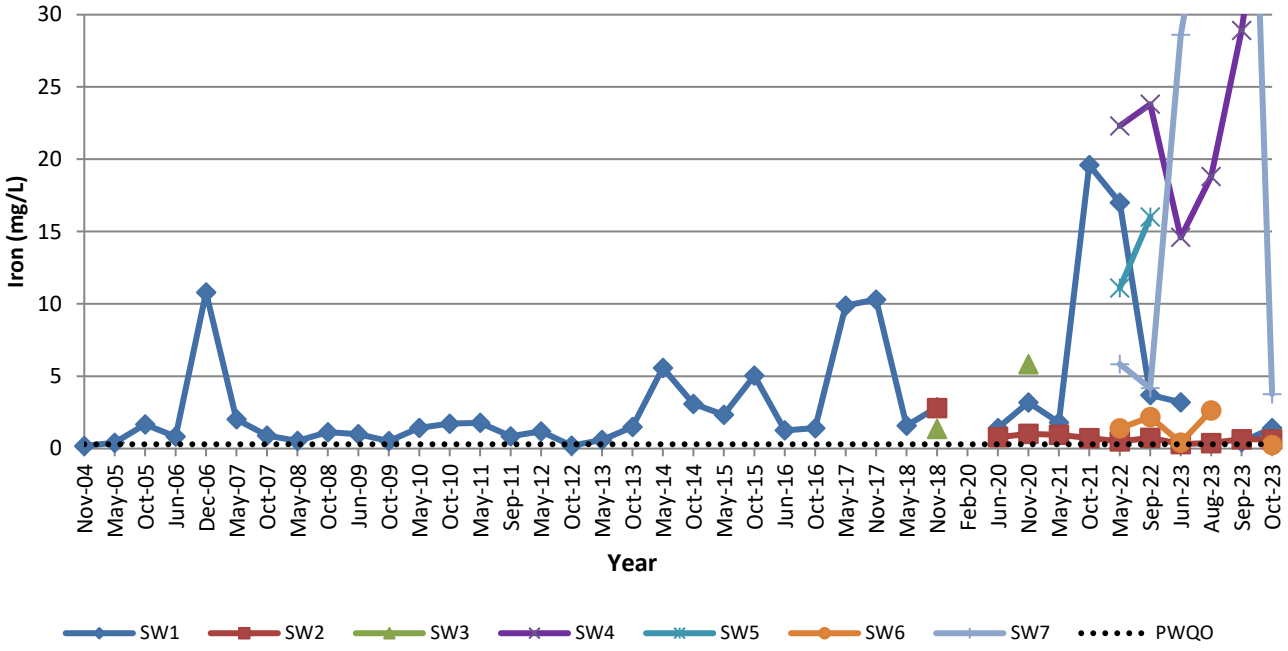


Chart H.8
Town of Blind River Municipal Landfill Site
Phenols Concentration Trending

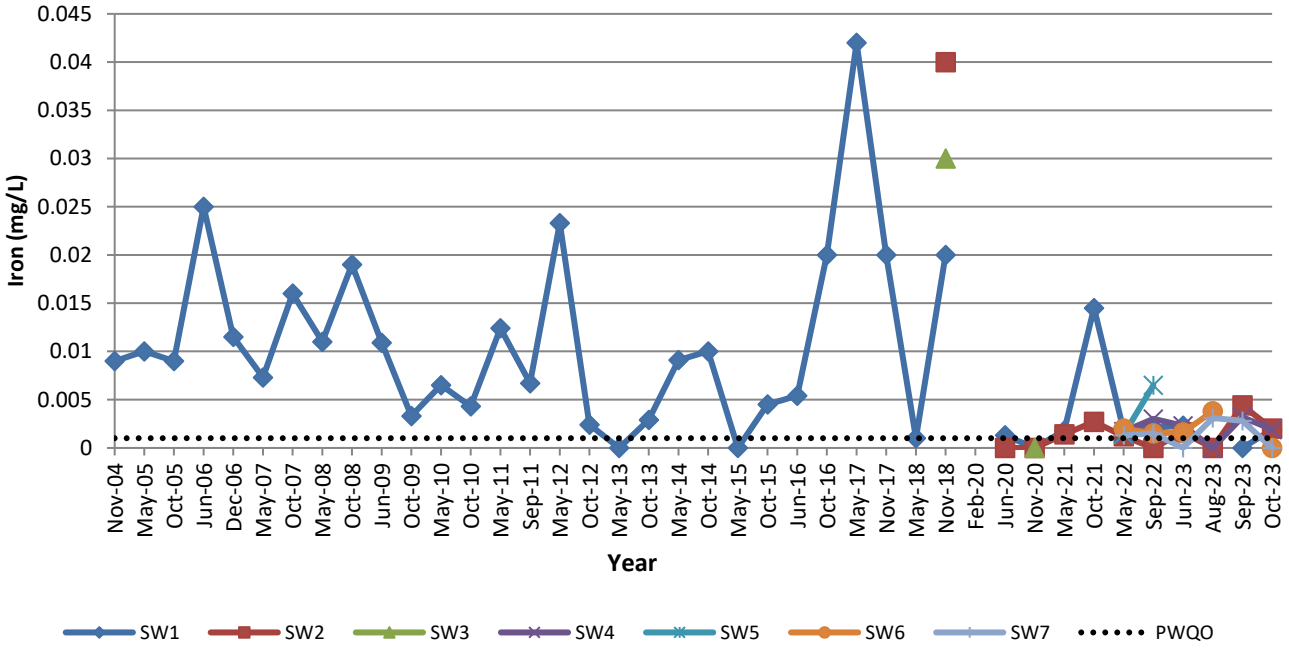


Chart H.9
Town of Blind River Municipal Landfill Site
Chloride Concentration Trending

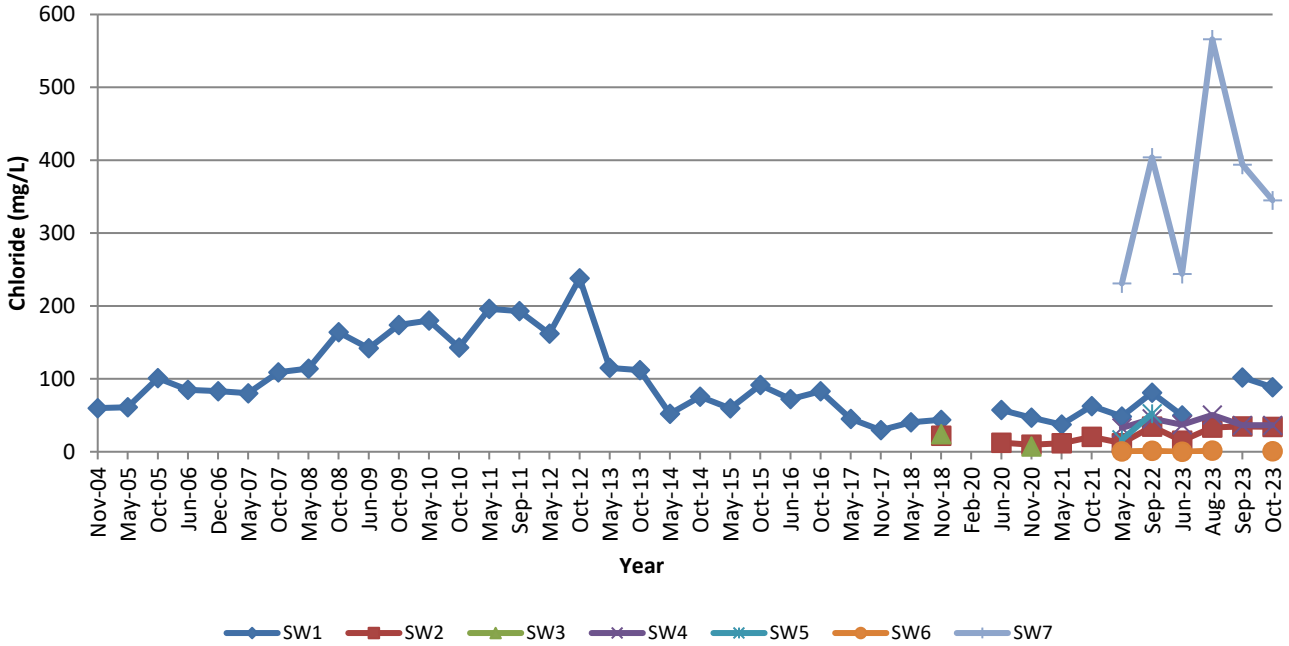
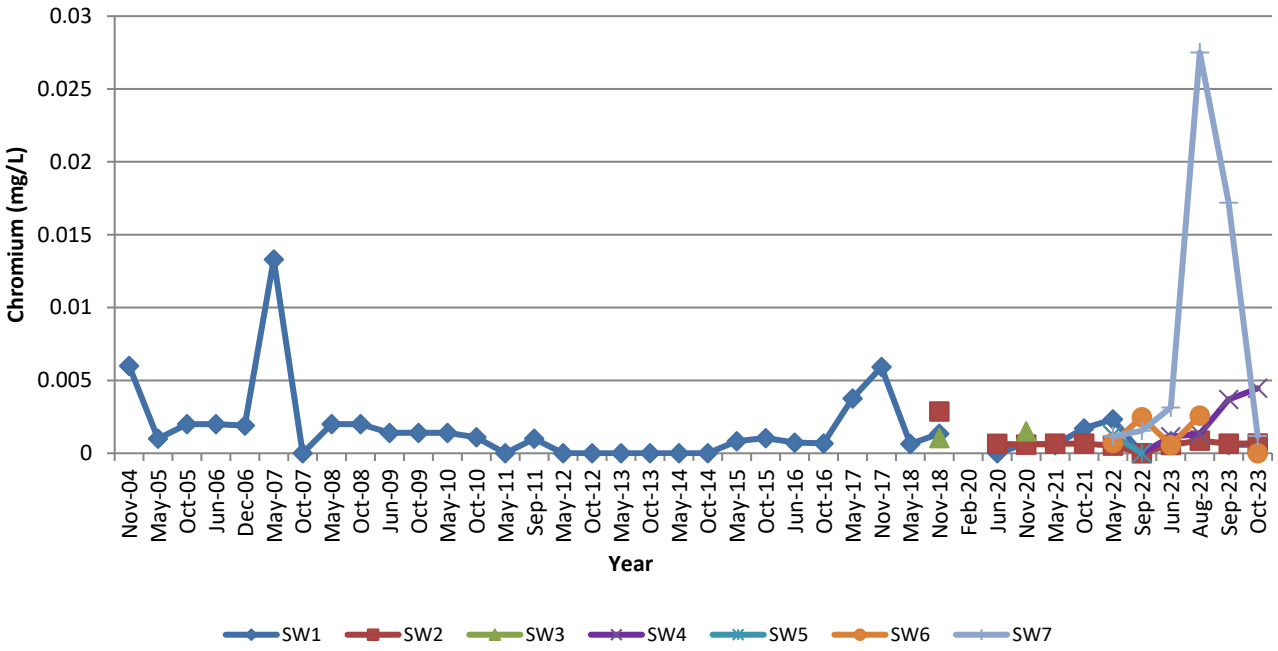


Chart H.10
Town of Blind River Municipal Landfill Site
Chromium Concentration Trending



Appendix I
Site Capacity Calculations

Town of Blind River Municipal Landfill - Site Life Calculation

2023 Annual Monitoring and Operations Report:

- Survey comparisons indicate a fill volume of 3,302m^3 (November 2, 2022 – October 5, 2023)
- There are 338 days between November 2, 2022 and October 5, 2023

Therefore, the average daily disposal rate during this period is: $\frac{3{,}302\ m^3}{338\ \text{days}} = 9.76\ m^3/\text{day}$

The 2023 annual disposal rate is: $\frac{9.7 m^3}{\text{Day}} \times 365\ \text{days} = 3{,}566\ m^3/\text{year}$

Remaining capacity as of October 5, 2023 (comparison of final contours): 1,758 m^3

When using the annual disposal rate of 3,566 m^3/year, the remaining site life of the landfill (as of October 2023) is:

$$= \frac{1{,}758\ m^3}{3{,}566 m^3/\text{year}}$$

= **0.49 years**

The remaining site life of the landfill is set to expire approximately 0.49 years after the survey being completed on October 5, 2023 when applying the annual disposal rate.

When applying the average annual disposal rate of 6,274 m^3/year, the remaining site life at the landfill is estimated to be approximately:

$$= \frac{1{,}758\ m^3}{6{,}304\ m^3/\text{year}}$$

= **0.28 years**

The remaining site of the landfill is set to expire approximately 0.28 years after the survey being completed on October 5, 2023 when applying the average annual disposal rate.

Town of Blind River Municipal Landfill – Diversion Rate Calculation

2023 Annual Monitoring and Operations Report:

Total Waste = 2,168.09 tonnes (provided by the Town)

Total Recyclables = 251.32 tonnes (provided by the Town)

$$\text{Diversion Rate} = \frac{\text{Total Recyclables}}{\text{Total Recyclables + Total Waste}}$$

$$= \frac{251.32}{251.32 + 2{,}168.09}$$

$$= \mathbf{10.4\%}$$

Appendix J
Monitoring and Screening Checklist

Appendix D-Monitoring and Screening Checklist
General Information and Instructions

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

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

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

Monitoring Report and Site Information	
Waste Disposal Site (WDS) Name	Town of Blind River Municipal Landfill Site
Location (e.g. street address, lot, concession)	Highway 17, South 1/2 of Lot 7, Concession 1 of Striker Township, District of Algoma
GPS Location (taken within the property boundary at front gate/ front entry)	N 5116641.907 m E 354605.951 m Zone: 17T Lat. 46.187825 Long. -82.884092
Municipality	Blind River
Client and/or Site Owner	Town of Blind River
Monitoring Period (Year)	2023
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	A713870 dated Nov. 26, 1980
Director's Order No.:	N/A
Provincial Officer's Order No.:	N/A

Other:	N/A		
Report Submission Frequency	◉ **Annual** ○ **Other**	Regulation 232/98 "Landfilling Sites" states "(a) within three months after each anniversary of the date on which waste was first accepted at the site, an annual report is prepared respecting the operation of the landfilling site...".	
The site is: **(Operation Status)**	◉ **Open** ○ **Inactive** ○ **Closed**		
Is there an active waste transfer station at the site?	○ **Yes** ◉ **No**		
Does this WDS have a Closure Plan?	◉ **Not yet submitted** ○ **Submitted and under review** ○ **Submitted and approved**		
Total Approved Capacity	N/A	*Units*	Cubic Metres
Maximum Approved Fill Rate		*Units*	
Total Waste Received within Monitoring Period (Year)	3,737	*Units*	Cubic Metres
Total Waste Received within Monitoring Period (Year) *Describe the methodology used to determine this quantity*	Estimated		
Estimated Remaining Capacity	1,758	*Units*	Cubic Metres
Estimated Remaining Capacity *Describe the methodology used to determine this quantity*	Direct Survey (GPS/Total Station)		
Estimated Remaining Capacity *Date Last Determined*	05/10/2023		
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)*	N/A		

Year Site Opened *(enter the Calendar Year only)*	1970	**Current ECA Issue Date**	26-Nov-1980
Is your Site required to submit Financial Assurance?		○ **Yes** ◉ **No**	
Describe how your WDS is designed.		◉ Natural Attenuation only ○ Fully engineered Facility ○ Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		○ **Yes** ◉ **No**	
If closed, specify ECA, control or authorizing document closure date:		N/A	
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**	The Town is currently undergoing consultation with the MECP regarding the Site's trigger Mechanisms Plan that may result in changes to the the currently monitoring program.
2) All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA or other relevant authorizing/ control document(s):	◉ **Yes** ○ **No** ○ **Not Applicable**	If no, list exceptions below or attach information.

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

Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

3) a) Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document.	◉ **Yes** ◯ **No** ◯ **Not Applicable**	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	◉ **Yes** ◯ **No** ◯ **Not Applicable**	If no, list exceptions below or attach additional information.

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

4) All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	◉ **Yes** ○ **No**	
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**	In accordance with direction from the MECP, the Town has initiated the process to formally establish a contaminant attenuation zone (CAZ).
6) The site meets compliance and assessment criteria.	○ **Yes** ◉ **No**	
7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.	◉ **Yes** ○ **No**	

1) Is one or more of the following risk reduction practices in place at the site: ***(a)*** **There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or** ***(b)*** **There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or** ***(c)*** **The site meets the following two conditions (typically achieved after 15 years or longer of site operation):** ***i.*** **The site has developed stable leachate mound(s) and stable leachate plume geometry/ concentrations; and** ***ii.*** **Seasonal and annual water levels and water quality fluctuations are well understood.**	◉ **Yes** ○ **No**	**Note which practice(s):**	☐ **(a)** ☒ **(b)** ☐ **(c)**
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	◉ **Yes** ○ **No** ○ **Not Applicable**	Trigger parameters and concentrations were determined for the 2023 monitoring period. See Section 5.6.1 of the annual report.	

Groundwater CEP Declaration:

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

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

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

Annual Report submitted to MECP District in July 2024

Recommendations:

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

No changes to the monitoring program are recommended ◉	
The following change(s) to the monitoring program is/ are recommended: ○	The Town is currently undergoing consultation with the MECP regarding the Site's trigger Mechanisms Plan that may result in changes to the the currently monitoring program.
No Changes to site design and operation are recommended ◉	
The following change(s) to the site design and operation is/are recommended: ○	
Name:	Chris Kresin
Seal:	Add Image 

Signature:		**Date:**	July 8/24
CEP Contact Information:	Chris Kresin		
Company:	Kresin Engineering Corporation		
Address:	536 Fourth Line East, Sault Ste. Marie, ON P6A 6J8		
Telephone No.:	705-949-4900	Fax No. :	705-949-9965
E-mail Address:	Chris@kresinengineering.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)	Ponding water (southwest of landfill), Lake Huron

Distance(s)	Ponding water (SW1, SW2, SW3, SW5) = approx. 180m, 330m, 440m, 100m respectively, southwest of current fill area Ponding water (SW4) = approx. 90m southeast of current fill area Ponded water/Westland (SW7) = approx. 1km southwest of fill area access road Lake Huron = approx. 1.25 km directly south of the landfill site

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

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	◉ **Yes** ◯ **No**	
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the ECA or relevant authorizing/control document(s) (if applicable):	◉ **Yes** ◯ **No** ◯ **Not applicable**	If no, specify below or provide details in an attachment.

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

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

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

4) All field work for surface water investigations was done in accordance with SOP, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	◉ **Yes** ○ **No**	N/A

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

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

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

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. ECA limit, PWQO, background	e.g. X% above PWQO
Boron	PWQO	SW1(253%/470%/280% - Jun/Sept/Oct); SW2 (28%/114%/158% 117% - Jun/Aug/Sept/Oct); SW4 (107%/103%/162%/93% - Jun/ Aug/Sept/Oct)
Un-ionized Ammonia	CWQG	SW1(331%/24%/392% - Jun/Sept/Oct);SW4(368%/817%/118%/ 1194%- June/Aug/Sept/Oct)
	AAC	SW4(74%/146-Aug/Oct)
Iron	PWQG/CWQG	SW1(966%/46%/373% -Jun/Sept/Oct);SW2(3%/27%/115%/110% - Jun/Aug/Sept/Oct);SW4(4767%/6167%/9533%/14233% - Jun/ Aug/Sept/Oct);SW6(38%/777% - Jun/Aug);SW7(2760%/3940% 6810%/276% - Jun/Aug/Sept/Oct)
	AAC	SW1(42%-Oct);SW4(1360%/1780%/2790%/4200%-Jun/Aug/ Sept/Oct);SW6(163%-Jun);SW7(2760%/3940%/6810%/276% - Jun/Aug/Sept/Oct
Nitrite	CWQG	SW1(18.3%/218%-Jun/Sept)
Total Phosphorus	PWQO	SW1(536%/194%/97%-Jun/Sept/Oct);51%/51%59%88 -Jun/Aug/ Sept/Oct);SW4(1380%/1510%/2130%/2260%-Jun/Aug/Sept/Oct; SW6(580%/2610%/394%-Jun/Aug/Oct);SW7(3590%/8360%/ 11800%/522%-Jun/Aug/Sept/Oct
Phenols	PWQO	SW1(130%/90%-Jun/Oct);SW2(60%/340%/100%-Jun/Sept/Oct); SW4(130%/180%220%/90%-June/Aug/Sept/Oct);SW6(60%/
	CWQG	280%-Jun/Aug);SW7(210%/180% - Aug/Sept) SW2(10%-Sept)
*Additional Parameters Attached		
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**	Previous surface water quality assessments have stated that leachate appears to be effecting water quality in the ponding water locations just south and southwest of the landfill site.

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**	Since the surface water sampling program began at the Blind River Municipal landfill site in November of 2004, boron, iron and phenols have consistently exceeded PWQO criteria.
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	MW1-20 failed to meet the following criteria: -AAC/CWQG for chloride during the spring and fall -PWQO for total phosphorus during the spring -PWQO/CWQG for arsenic, cadmium,copper, iron, lead and zinc during the spring and fall -AAC for cadmium, copper, iron, lead and zinc during the spring and fall -CWQO for manganese during the spring and nickel during the fall MW1-03 failed to meet the following criteria: -AAC/CWQG for chloride during the spring and fall -PWQO for total phosphorus during the spring -PWQO/CWQG for boron, iron and lead during the fall -CWQG for copper during the fall -AAC for iron,
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	◉ **Yes** ○ **No** ○ **Not Applicable**	Trigger parameters and concentrations were determined for the 2023 monitoring period. See Sections 5.6.1 and 5.6.2 of the annual report.

Surface Water CEP Declaration:

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

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

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

Annual Report submitted to MECP District in July 2024.

Recommendations:

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

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

CEP Signature	
Relevant Discipline	B. Sc. (Eng.) - Environmental Engineering, M. Sc. (Eng.) - Water Resources Engineering
Date:	July 8/24
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