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Somerville Landfill Site 2025 Annual Monitoring Report 381 Ledge Hill Road City of Kawartha Lakes

Prepared for City of Kawartha Lakes

AEC Project No. 26-010 | May 2026



Environmental Assessments & Approvals

May 29, 2026

AEC 26-010

City of Kawartha Lakes
Waste Management Department
322 Kent St. West
Lindsay, ON
K9V 4T7

Attention: Ms. Kayla Pantaleo Compliance Officer

**Re: 2025 Annual Monitoring Report
Somerville Waste Disposal Site**

Dear Kayla:

Azimuth Environmental Consulting, Inc. (Azimuth) is pleased to provide the 2025 Annual Monitoring Report (AMR) for the Somerville Waste Disposal Site (Site). The data and interpretation included provides a summary of the 2025 monitoring data with comparison to the historical data and accurate assessment of the current state of the landfill Site. This report has been prepared in compliance with the existing Environmental Compliance Approval (ECA) and applicable Provincial standards. This assessment also interprets the longer-term trends at the Site such that an appropriate monitoring program can be proposed for the current state of the landfill.

The environmental setting at the Somerville Landfill Site is well understood based on over 30 years of performance monitoring. The data trends over this monitoring period have yielded a relatively consistent geochemical signature such that it is reasonable to infer that the Site reflects a steady state condition. This is supported by the general consistency between the 2025 data with the historic data set.

If there are any questions regarding the content of the report, do not hesitate to contact the undersigned.



Yours truly,

AZIMUTH ENVIRONMENTAL CONSULTING, INC.



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EXECUTIVE SUMMARY

The Somerville Landfill Site (Site) is located at 381 Ledge Hill Road, within the City of Kawartha Lakes (the "City"). The Site has operated as a waste disposal facility since 1972 and has a 13 ha landfilling area within the 61.6 hectare (ha) Site. The Site relies on natural attenuation to manage landfill leachate and gases produced by the wastes. The Site operates under Ministry of the Environment, Conservation & Parks (MECP) Environmental Compliance Approval (ECA) No.: A321604 which was amended on February 24, 2022 to reflect increases to daily waste and leaf/yard limits.

The geology of the Site is relatively simple, with a silty sand/sandy silt till overburden layer overlying fractured limestone bedrock. The landfill area itself is situated within a northeast-southwest oriented drumlin, which dominates the local topography and controls ground water flow such that there is both an easterly and westerly component on either side of this feature or the waste mound present at the northwestern section of the Site. It is important to note that the radial flow pattern away from the waste mound is localized to just outside the edge of the waste mound, while the predominant regional flow in the overburden is toward the northwest as defined by the entire monitoring well network. There continues to be only a dilute leachate signature extending around the waste area to the northeast likely isolated to the City property or road allowance to the northwest. This indicates that attenuative processes are active and effective at the Site.

Exceedances with respect to Reasonable Use Policy (RUP) B-7-1 continued in 2025, with a number of elevated concentrations along the northeastern property boundary (MW11 & MW14). However, MW204 which is ~100 m past MW11 and MW14 and MW203 which is ~150m past MW8-I/III has shown to be represented by naturally mineralized water quality with an absence of more prominent leachate indicator parameters such as ammonia, DOC, iron and manganese which have been shown to be elevated at MW14 owing to leachate influence. This would indicate that the bedrock fracture plane targeted at MW14 is not laterally extensive such that migration of leachate impacts within the bedrock to the northeast is limited to within the road alignment. Similarly, more regional bedrock flow patterns are noted to be in a southwesterly direction which would limit the extent of eastern flow associated with the localized or radial patterns derived from the waste mound and drumlin feature



As in previous years, surface water quality results did not indicate any leachate influence. The 2025 water quality results suggest that the Site is providing adequate attenuation of leachate within the property boundaries.

Landfill gas monitoring was completed in 2025, similar to previous years, and continues to yield data indicating that gas is present within / adjacent to the active and historical waste area. The majority of detections were trace in nature (<0.1% volume), with the exception of max readings (100% LEL) at monitors MW1-II and MW17, which is not unexpected as these wells are screened within or directly adjacent to waste.

The gas monitoring program indicates the presence of methane within and immediately adjacent to the waste areas; however, only trace concentrations interpreted to represent low level detections of natural organics in the soil (*i.e.*, <50 ppm), not related to the landfill were observed in the distant locations. Given the remote location of the Site and lack of measurable gas concentrations beyond the immediate area of the waste, continued gas monitoring is not considered warranted, aside from monitoring of on-site buildings.

Overall, the monitoring data collected in 2025 is similar to what has been observed historically and would suggest that the Site is in a steady state condition with minimal evidence of a leachate plume extending beyond the waste footprint. With the exception of the gas monitoring, which is recommended for removal (maintained in Site buildings), the remaining ground and surface water monitoring program should continue in 2026 as it was completed in 2025. It is noted that for removal of the gas monitoring program, written approval from the MECP director is required.



1.0 INTRODUCTION

The City of Kawartha Lakes (City) is responsible for the operation and maintenance of the Somerville Landfill Site (Site) in accordance with the Environmental Compliance Approval (ECA) (No. A321604) issued by the Ministry of the Environment, Conservation & Parks (MECP) in January 1980 and last amended August 2019 (Appendix A).

The following report provides a summary of the 2025 monitoring data with comparison to the historical data set such that an accurate assessment of the current state of the landfill Site is provided with respect to compliance with the existing ECA and applicable Provincial standards.

1.1 Site Background

For the purposes of efficiency and consistency, much of the background information provided within this report has been referenced from previous Site reports, all of which have been referenced in Section 9.0.

The Site is located at 381 Ledge Hill Road within the City of Kawartha Lakes (Figure 1). Waste deposition began at this 61.6 hectare (ha) Site in 1972 and continues to the present with a landfilling area of 13 ha. The waste fill areas are located within a drumlin which trends south-west to north-east through the Site (Figure 6). The silty sand till drumlin is ~20 m thick and the waste fill thickness is up to ~10 m thick in Area 2 of the Site which is the historical fill area. The Site relies on natural attenuation to manage landfill leachate and gas produced by the waste.

The Site, which can be subdivided by the various periods of activity and waste deposition (Figure 2), includes an area of active deposition, a compost pad, and various areas of historical deposition which are now closed (Area 1 & 3). Area 1 reportedly received approximately 60,000 m³ of household waste prior to being closed and covered with clay in the spring of 2002. Area 3 received household, construction and demolition waste. The current cell development and landfilling is in Area 2. Waste types include residential, commercial, and construction/demolition. The northern portion of Area 2 was capped in Fall 2020. Landfilling is currently occurring in the southwest portion of Area 2 and cell development is progressing towards the southeast. The northern portion of Area 2 has received final cover and interim cover. As landfilling progresses in Area 2 the interim cover placed in the northern portion will be removed to connect to the south of Area 2.



2.0 GEOLOGY

The geology at the Site is described as consisting of sandy silt to silty till, which is underlain by weathered limestone bedrock (Azimuth, 2012). The Site is located on the edge of a drumlin feature, which trends southwest-northeast through the Site and across the waste storage areas (Figure 6). Based on the available borehole logs (Appendix B), the overburden thickness at the Site varies between 0 m (*i.e.*, areas of bedrock outcrop) in the north, to as much as 20 m on the drumlin.

Chapman and Putnam (1984) indicate that the Site is located near the boundary of the Dummer Moraines and Georgian Bay Fringe physiographic regions. The Ontario Geological Survey (OGS) OGS Earth database¹ indicates that the surficial geology in the area of the Site consists of till deposits, comprised of a mixture of sand and silt, overlying Paleozoic bedrock. OGS Earth also indicates the presence of an area of organic deposits (*i.e.*, peat) immediately northwest of the landfill. The uppermost bedrock unit is reported to be limestone of the Bobcaygeon Formation.

3.0 HYDROGEOLOGIC INTERPRETATION

As noted previously, the current ground water monitoring network consists of 23 monitoring wells, including 6 wells in the shallow overburden, 4 wells in the deep overburden, 12 wells in the bedrock, and 1 leachate monitor (Figure 2). The available ground water elevation measurements are provided in Appendix C.

The water level in the leachate monitor (MW17) is at about 291-292 masl. In contrast, most of the ground water monitoring wells report water levels below 282 mASL or in proximity to the bedrock contact. There are a few monitoring locations (*i.e.*, MW1-I, MW1-II, MW2-II, MW10-II & MW16-III) that report ground water levels above 285 masl. It is noted that MW17 showed a decline in ground water elevation from approximately 295 masl to 291-292 masl after 2021. This decline is likely attributable to the capping of the waste cell in 2020.

In order to simplify the hydrogeological interpretation, the ground water flow regime at the Site is considered to consist of two flow systems being the topographically controlled shallow overburden system and the shallow limestone bedrock system (Figures 3 & 5). These figures illustrate flow within the shallow overburden (Figure 5) to be east and northwest, originating from the peak of the drumlin feature / waste mound

¹ http://www.mndm.gov.on.ca/mines/ogs_earth_e.asp



(MW17) that creates a ground water divide through the Site. The mounding would create localized radial flow from the active waste mound such that localized easterly flow towards the eastern property boundary is shown. The isolated bedrock flow pattern (Figures 3 & 4) shows ground water flow is generally in a south to west direction towards the Burnt River, the ultimate groundwater discharge zone, which is consistent with previous years.

4.0 SITE CONCEPTUAL MODEL

The geology of the Site is relatively simple, with a silty sand/sandy silt till overburden layer overlying fractured limestone bedrock. The landfill area itself is situated within a northeast-southwest oriented drumlin, which dominates the local topography (Figure 6).

Ground water measurements from selected overburden monitoring wells indicate that a perched ground water mound exists within the drumlin as well as the waste mound. It has been shown in previous reporting that a ground water divide is present and oriented along the long axis of the drumlin. It is expected the rainfall on the drumlin will percolate within the shallow overburden soils with flow then diverging either to the southeast or northwest, with more local radial flow to the east of the active waste area.

Based on the topographic contours (Figure 6), it is expected that all the current waste areas (Areas 1, 2, and 3) are located on the northwest side of the ground water divide, while the new waste cell at the south end of Area 2 may straddle the divide such that there is some potential flow from this waste area to the south / southeast. As such, ground water from the existing waste and compost areas (and by extension leachate and leachate affected ground water) would be expected to migrate away from the drumlin to the west and northwest, depending on the orientation of the topographic slope. Under these conditions, it is expected that ground water mounded within the drumlin would discharge, likely near the toe of the slope, and move as a component of overland drainage toward the pond/swamp area northwest of the Site or migrate downward into the bedrock and then migrate westward following the regional groundwater flow toward the Burnt River.

Ground water level measurements in the bedrock fracture system (*i.e.*, deep system) indicate that the piezometric surface within the bedrock is relatively flat and does not show evidence of influence from the perched ground water mound within the drumlin or waste mound likely due to a potentially higher flux in the bedrock relative to the overburden till unit. There also appears to be an unsaturated zone within areas of the



shallow bedrock, which has led to many of the bedrock monitors requiring deeper installation depths into this unit (~8 m into bedrock). This is not surprising as there is an exposed unsaturated bedrock outcrop further northwest along Ledge Hill Road. Based on this information it appears that the bedrock contact zone may have a low vertical permeability and lacks a strong hydraulic connection with the overlying overburden. It is speculated that the various shallow bedrock ground water monitoring wells installed at the Site have not intersected permeable fracture zones or are above the true water table which was observed at some historical bedrock wells which have been removed due to a lack of water. This still suggests that the bedrock contact possesses a competent cap which is not vertically transmissive. The surrounding wetland environment attests to this possibility where surface waters are trapped on top of the bedrock contact (as opposed to be easily drained into the underlying rock). This is most obvious in the spring, when the pond and area to the west of the waste are becomes seasonally flooded.

It is expected that the geochemical composition of natural overburden ground water in this type of environment will be characterized by relatively low concentrations of major ion parameters. Bedrock ground water geochemistry is anticipated to be controlled by laterally continuous bedding plane fractures within the layered limestone setting. Water quality will likely be dependent on the permeability (*i.e.*, fracturing) of the rock, the depth to bedrock, and the bedrock composition. In areas where the bedrock is relatively permeable and occurs at a shallow depth, the bedrock geochemistry may closely resemble the overburden ground water geochemistry. In deeper zones, or zones of lower permeability the ground water may be more mineralized due to prolonged water-rock interactions. This is most evident at MW203 and MW204, which are noted to have very slow recoveries following purging during monitoring events relative to the remaining new well constructions. As a result, the water quality at these locations are different than the remaining locations, indicating a much more mineralized water quality with elevated strontium, boron, magnesium, potassium, sodium and chloride concentrations above those observed at MW14, which is in closer proximity to the landfill and screened at a similar elevation in the bedrock. It is also noted that the water quality at MW203 and MW204 are notably absent of elevations for a number of more prominent leachate indicator parameters such as ammonia, DOC, iron and manganese which have been shown to be elevated at MW14 owing to leachate influence. This would indicate that the bedrock fracture plane targeted at MW14 is not laterally extensive such that migration of leachate impacts within the bedrock to the northeast is limited to within the City owned road alignment. Similar mineralized water quality may



also be present at MW202 based on more subtle elevations of the same parameters as MW204.

The dominant water quality signature for all ground water monitoring samples is calcium carbonate. This is anticipated in a limestone environment including the overlying till which is a limestone based material. On a dissolved mineral percentage basis, the calcium carbonate in solution represents at least 75% of major ion chemistry and in most cases over 90% of the major ion chemistry even for leachate samples. The elevated calcium content will translate to a hard water signature (*i.e.*, naturally elevated hardness concentration).

The strongest leachate geochemical signature is represented by ground water samples from MW17. This well was installed in September 2016 and screened within the most current wastes. It provides an accurate representation of leachate conditions within the active area of the landfill. The water quality at this location has significantly elevated leachate parameter concentrations above all other monitoring locations, indicating that attenuative processes are active a short distance from the waste mound. The more mature and weaker leachate signature is represented by the MW1 samples.

Based on the inferred ground water flow pattern in the area (*i.e.*, the presence of an overburden ground water divide), ground water from MW13, located about 250 m south of the Site, is most representative of background ground water conditions, at least for the overburden profile. The ground water at MW13 has relatively low mineralization, with all measured parameters present at concentrations below their respective ODWQS guidelines, with the exception of hardness. The most representative background bedrock water quality has historically been considered to be from MW5 given the equally dilute concentrations and location on the north side of the drumlin feature. However, with the most recent constructed wells MW201, MW202 and MW203, there are additional background reference locations which can also be used as reference in the future if MW5-I becomes leachate impacted as a result of the fill progression towards this monitoring well location.

Of the wells in the downgradient monitoring network, only MW1-I, MW1-II, MW2-II, MW10-II & MW11 (overburden), MW8-III and MW14 (bedrock) are potentially detecting a weak leachate signature. As well, weak and inconsistent leachate influence is noted on occasion at MW12 during fall sampling.



In general, the leachate impacts are assumed to be indicated by the presence of general chemistry parameters (*i.e.*, leachate indicators) above the concentrations measured at the applicable background well (either MW13 for overburden or MW5 / MW16-I for bedrock). The geochemical signature at MW14 is considered to be leachate influenced with elevated iron, manganese, DOC, alkalinity, hardness, chloride, and barium concentrations in comparison to background concentrations.

As noted above, the ground water geochemistry results indicate that leachate impacts are detected at several locations. However, in general it appears that the leachate impacts are relatively minor, relative to the leachate quality observed at MW17. As well and based on the available data, influences are largely limited to increased concentrations of various parameters which are not considered a concern to human health (based on the ODWQS). In addition, several of the parameters which are attributed to leachate impacts are commonly found to be elevated above the ODWQS in natural ground water (*e.g.*, iron, manganese, hardness) and tend to be mitigated by natural processes which will limit the potential for migration (*i.e.*, chemical oxidation).

Given the presence of a ground water mound within the drumlin, and the relatively steep slope on the northwest side of the Site, there is the potential for leachate affected ground water to discharge via surface seeps to the ponded area in the northwest. However, surface water chemistry in the ponded area is consistent with that measured at the background location, suggesting that landfill operations are having a negligible effect on surface water quality. It is further noted that surface flow at the Site is towards the toe of the landfill from the pond to the north during wetter periods in the spring, which likely provides increased dilution potential.

Finally, there has been a decline in the elevation of the leachate mound measured at MW17 over the past several years. This reduction in mound elevation will reduce the lateral hydraulic gradient which will limit the radial ground water flow path to the northeast.

5.0 SUMMARY OF 2025 MONITORING PROGRAM

The 2025 monitoring program for the Site was undertaken by Azimuth Environmental Consulting (Azimuth). Azimuth completed all gas, ground and surface water monitoring which occurred in April and October.



This program includes 23 ground water monitoring wells, three surface water locations and landfill gas at all monitoring wells and two dedicated gas monitors. The details of the monitoring program are summarized in the following table.

Table 1: 2025 Monitoring Program

Monitoring Station	Frequency	Parameters
<u>Ground Water</u> MW1-I, MW1-II, MW2-II, MW5-I, MW7, MW8-I, MW8-III, MW9, MW10-II, MW11, MW12, MW13, MW14, MW15, MW16-I, MW16-II, MW16-III, MW17, MW201, MW201D, MW202, MW203 & MW204	Semi-Annual (April / May & September / October)	Biochemical Oxygen Demand (BOD), Dissolved Organic Carbon (DOC), alkalinity, ammonia, chloride, hardness, nitrate, sulfate, Total Kjeldahl Nitrogen (TKN), barium, boron, calcium, iron, magnesium, sodium, potassium, manganese, pH, conductivity, Total Dissolved Solids (TDS), Total Suspended Solids (TSS) (leachate only), Chemical Oxygen Demand (COD), phenols, Free cyanide, nitrite, phosphorous, aluminum, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, colour, & turbidity
<u>Surface Water</u> SWA, SWB & SWD		VOCs – annual during Fall event for all ground water locations
<u>Landfill Gas</u> All monitoring wells above, as well as GP-1 & GP-2		% Volume & % Lower Explosive Limit (LEL)

Prior to sampling at ground water monitors, static water levels were measured. Ground water samples were then collected following purging of at least three well volumes of water from each monitor using dedicated check valve pumps and tubing or until the monitor was dry and sufficient recovery allowed for a sample collection. Ground water samples for metals and DOC analysis were also field-filtered using disposable 0.45 µm filters.

Surface water samples were collected at a depth about equal to half of the surface water features total depth, while minimizing the potential for sediment entrainment and were not filtered. For both ground and surface water sample collection, field parameters are collected including pH, electrical conductivity, temperature and dissolved oxygen (surface water only). Flow, if present is documented and measured.



Landfill gas is collected at all monitoring well locations using an RKI Eagle Photo Ionization Detector (PID) which is capable of measuring methane. This instrument has an accuracy of +/-5% of reading. It is noted that this instrument is commonly used for landfill gas monitoring within landfill gas monitoring networks.

Azimuth calibrates the gas meters prior to each monitoring season, with “bump” testing completed ahead of every monitoring event using methane gas standards at the office to confirm the equipment is measuring correctly. If bump testing indicates variance from standard, then a full calibration is completed, or the unit is sent in for servicing / cleaning of the unit.

The 2025 program was completed as required with the exception of ground water sample collection from MW1-II (fall), MW5-I (fall), MW7 (fall), MW8-I (fall), MW8-III (fall), MW9(spring & fall), MW11 (fall), MW12 (fall), MW16-I (fall), MW16-II (fall), MW17 (fall), MW201 (spring & fall) & MW201D(spring). All of these locations were dry or insufficient water for sample collection, while MW9 was not sampled in 2025 as it was inaccessible due to downed trees in area of the well from the March 2025 ice storm and MW7 was below water during the April monitoring event so was inaccessible. The surface water locations were sampled in the spring, but all were dry during the fall monitoring event so no samples were able to be collected.

In 2025, the analytical testing was completed by Caduceon Environmental Laboratories (Caduceon) of Kingston or Richmond Hill, Ontario. Caduceon is accredited by the Canadian Association of Laboratory Accreditation (CALA). Unabbreviated Laboratory Certificates of Analyses for all testing are presented in Appendix D, while the data has also been summarized with the historical data in Appendix E.

5.1 2025 QA/QC Samples

As part of the routine sampling program for the Site, duplicate samples were collected and analyzed for quality assurance purposes. In 2025, a total of four QA/QC samples were collected out of the 37 ground/surface water samples collected. The laboratory was not advised of the sample duplication prior to analysis of these samples. Laboratory duplicate precision was assessed using Percent Difference, which is the difference between two concentrations divided by the average of the two concentrations.

Results are provided in Appendix E and were found to be generally within acceptable limits (*i.e.*, <20% variation), with the exceptions summarized in the following table



(Table 2). It should be noted that as the analytical results approach the detection limit, the precision of the analysis tends to decline, while these differences are also exaggerated with the lower detection limits and may account for some of the variation observed. This is the case for most of the variance noted in the table below. It is further noted that the results all fall within the historical range for concentrations at each location such that the data is considered representative.

Table 2: QA/QC Analysis

April (MW15)			
Parameter	Results (mg/L)		Difference (%)
Iron	<0.005	0.008	46%
COD	21	7	100%
Molybdenum	0.0017	0.0005	109%
Phosphorus	0.02	0.03	40%
Vanadium	0.0004	0.0003	29%
April (MW16-III)			
Parameter	Results (mg/L)		Difference (%)
Ammonia	0.19	0.15	24%
Arsenic	0.0001	0.0002	67%
Chromium	0.002	0.003	40%
Cobalt	0.0003	0.0004	29%
Nickel	0.0008	0.0004	67%
Total Phosphorus	6.56	4.73	32%
October (MW16-III)			
Parameter	Results (mg/L)		Difference (%)
Ammonia	0.35	0.12	98%
Copper	0.0006	0.0004	40%
TKN	0.05	0.03	50%
Boron	<0.005	0.008	46%
October (MW204)			
Parameter	Results (mg/L)		Difference (%)
Antimony	0.0006	0.0001	143%
COD	21	7	100%
Molybdenum	0.0017	0.0005	109%
Total Phosphorus	0.02	0.03	40%
Vanadium	0.0004	0.0003	29%
Cadmium	0.000028	<0.000015	60%
Copper	0.0009	0.0007	25%



5.2 Ground Water & Leachate

5.2.1 Ground Water & Leachate Flow

Water level measurements were obtained prior to any disturbance of the static piezometric surface using an electronic water level meter (accuracy of ± 0.2 cm). The water level data collected during monitoring events in 2025 was generally consistent with the historical data set.

Contouring of the water level data demonstrates the direction and rate of the shallow ground water flow in the vicinity of the waste (Figures 5a and 5b). The flow in the area of the current and historical waste is generally to the northwest. The ground water elevation data from MW17 also indicates a leachate mound is present which would create radial flow resulting in a localized eastern flow path in the area of MW11 and MW14. Ground water flow beyond the waste area to the south indicates a southern flow path following the local topography of the drumlin.

In contrast, the shallow bedrock ground water flow direction (Figures 3 & 4) aligns with the direction of the regional bedrock dip being westward and southwestward. This is also the same direction from the landfill to the Burnt River and the likely discharge location for deep groundwater from the Site. Therefore, the leachate-influenced water entering the bedrock in proximity to MW14 is then travelling back under the landfill Site in a westward and southwestward direction.

It is noted that the flow patterns for both the overburden and bedrock follow those observed in previous years.

5.2.2 Background Ground Water Quality

The background ground water chemistry is currently and has historically been monitored at an upgradient bedrock location (MW5-I) and overburden location (MW13) which are both located south of the current fill area (Figure 2). Two additional upgradient bedrock monitoring wells (MW201D & MW202) were installed in October 2019 and are included in the interpretation. MW201 was also installed in 2019 but a sample has yet to be taken due to dry or insufficient water conditions.

The water quality can be characterized by a low to moderate level of mineralization in both the overburden and bedrock. Ontario Drinking Water Quality Standards (ODWQS, 2006) are consistently exceeded for hardness within both the bedrock and overburden. Dissolved organic carbon (DOC) is noted to exceed on occasion in both of the units,



albeit mostly in the overburden horizon. The wetland environment present around the Site could account for the enhanced DOC concentrations being vegetation decay (*i.e.*, lignins and tannins). Water quality for MW202 is consistent with the description provided above for the other background monitors. MW201D has shown exceedances for arsenic, iron, DOC and manganese in 2025 similar to previous years. The 2025 analytical data is generally consistent with historical data as illustrated on the chemistry over time graphs (Appendix F).

5.2.3 Leachate Quality

Leachate quality is controlled by the availability of soluble contaminants in the waste pile, the residence time of infiltrating water in the waste, and the physical conditions (*i.e.*, temperature, redox potential, and pH) of the solution. Compared to natural waters, leachate that is produced from landfilled waste typically possesses elevated concentrations of calcium, magnesium, sodium, potassium, iron, zinc, chloride, sulphate, alkalinity, ammonia, total kjeldahl nitrogen (TKN), conductivity, total dissolved solids, dissolved organic carbon, and/or phenols (Jones, 2001). Aluminum, boron, barium, cobalt, nickel, strontium, titanium, vanadium and phosphorus species are also typically enriched in leachate, although to a lesser degree. Leachate quality changes over time as a result of continued leaching of the waste pile, which preferentially removes more soluble compounds first. The valence of certain species (*i.e.*, nitrogen, sulphur) can also be used to evaluate differences between leachate impacted and non-impacted waters, specifically the oxidation state which tends to be depleted in leachate. Inherent difficulties arise when selecting leachate related parameters in a limestone bedrock environment. Typically, elements such as calcium, magnesium, alkalinity and sulphate can be elevated in natural limestone bedrock ground waters, thus reducing their effectiveness to be used as leachate indicator parameters.

Presently, the best available estimate of leachate quality at the Site is the analytical data obtained from MW17, which is screened within the waste of the active area (Area 2). Given this well is within the active waste area, it provides the best representation of current leachate conditions at the Site, although it is noted that MW1-II is immediately downgradient of the historical waste cell for the Site (Area 1), such that this also provides a reference for the more historic and mature leachate signature at the Site.

For the Site, the leachate strength is relatively high in the north end of Area 2 as the Site has been active in this area (MW17) recently with filling occurring up to 2020. One of the most significant deviations noted between the leachate and natural levels is with respect to nitrogen species (*i.e.*, TKN and total ammonia [as N]), although other notable



elevations include boron, chloride, alkalinity, hardness, TDS, as well as a number of other parameters. Elevated concentration of both ammonia and TKN is indicative of a geochemically reducing environment, as is typical of ground water conditions in the immediate vicinity of any landfill site. This is primarily due to the consumption of available dissolved oxygen within the subsurface by bacteriological activity, which is catalyzed by the large quantity of organic matter (organic carbon source for energy-producing reactions) occurring within the waste mass. The microbial activity is limited by the available oxygen which is often depleted within the landfill mass and hence the use of alternative sources of oxygen by facilitative bacteria (*i.e.*, reduction of oxygenated species [$\text{NO}_3 \rightarrow \text{NO}_2 \rightarrow \text{NO} \rightarrow \text{NH}_3$ and $\text{SO}_4 \rightarrow \text{SO}_2 \rightarrow \text{H}_2\text{S}$] dissolved in the leachate).

These geochemically reducing conditions will also allow for valence changes in many metal species which tends to increase dissolution potential of metal ions. This is evident at this Site with the significantly elevated iron concentrations (see Table 3 below).

The historic leachate signature for Area 1 as evidenced by the water quality at MW1-I/II, shows a more depleted / mature signature that is absent of the significant ammonia / TKN elevations observed at MW17 as expected since this portion of the landfill is older. Elevated concentrations remain for the majority of leachate indicator parameters; however, their concentrations have shown to be stable for the period of record, as illustrated in the temporal graphs included in Appendix G.

Based on the leachate quality derived at MW17 as well as previous MECP comments, the leachate indicator parameters (LIPs) identified for this Site in 2025 are listed below. It is noted that these are the same as last year:

- | | |
|---------------------------------|---------------------------------|
| -Alkalinity | -Chemical Oxygen Demand (COD) |
| -Chloride | -Calcium |
| -Dissolved Organic Carbon (DOC) | -Iron |
| -Barium | -Boron |
| -Ammonia | - Total Kjeldahl Nitrogen (TKN) |
| -Hardness | -Manganese |
| -Potassium | -Sodium |
| -Total Dissolved Solids (TDS) | |



5.2.4 Downgradient Ground Water Quality

In 2025, the ground water quality downgradient of the Site was monitored via eight overburden and ten shallow bedrock monitoring well locations, although as noted above some of the newer bedrock monitors installed to the south of the landfill area in 2019 may more likely represent background water quality. The potential horizontal migration of the leachate plume beneath the Site was evaluated by looking at average concentrations for numerous typical leachate indicator parameters. Averages are used for the previous five years of sampling as this is the most current and relevant data. This average concentration data is provided in the following tables for both the overburden (Table 3) and bedrock (Table 4) locations.

The total concentrations of leachate parameters in ground water are relatively low for locations outside of the immediate vicinity of the waste mound (e.g., chloride levels are generally less than 25 mg/L, except for MW203 & MW204 owing to natural bedrock mineralization). The following sections describe the surrounding locations where low levels of leachate are observed.

The concentrations provided for the overburden indicate a subtle leachate influence that is evident in some downgradient monitors, albeit concentrations are largely reduced from MW17. As illustrated in Table 3 below, the most impacted locations include MW1-I, MW1-II and to a lesser extent MW11. The elevated concentrations at MW1-I and MW1-II are not surprising as these are located within the former waste footprint of Area 1. MW11 shows elevations of certain leachate indicator parameters and to a much lesser extent MW10-II. More recently MW2-II has shown increasing concentrations for most LIPs since 2023, which is the result of the active waste area becoming in closer proximity to this location since 2022. The most notable parameters include: alkalinity, calcium, DOC, iron, manganese and TDS. These elevated concentrations are not unexpected as the ground water elevations at MW17 indicate that a ground water mound is present that would create localized radial flow such that leachate migration would be expected at these locations, only a short distance from the waste mound. However, the lack of detections at MW16-III would indicate that this easterly flow path within the overburden is localized and likely limited a short distance beyond MW11.

Beyond the localized easterly flow path from the waste mound, the ultimate downgradient area of the landfill is towards the west and northwest of the current waste area with MW7 representing the downgradient location. Given that the water quality at this location shows a very similar signature to MW13, there is no evidence to



suggest a leachate plume extending within the overburden from the landfill in this area. Very subtle and seasonal leachate influence is observed at MW12 indicating that leachate migration is to the west, albeit attenuative processes are active limiting the strength and extent in that direction.

Similar to the overburden monitoring wells, Table 4 summarizes the average concentrations at the bedrock monitoring wells for the defined leachate indicator parameters. The leachate signature is most readily observed at MW8-I, MW8-III, MW14 and possibly marginally at MW9 with elevated alkalinity, calcium, iron and manganese concentrations. The water quality at MW14, is likely reflective of the localized 'halo' of radial flow from the leachate mound noted within the shallow water table, which is estimated to be approximately 5 to 10 m above the surrounding shallow water table along the western slope of the drumlin feature in the overburden. MW204 is located approximately 100 m northeast of MW14 and the water quality at this location is much different than the remaining locations indicating a much more mineralized water quality with elevated strontium, boron, magnesium, potassium, sodium and chloride concentrations above those observed at MW14. It is also noted that the water quality at MW204 is notably absent of high levels of leachate indicator parameters such as DOC, iron and manganese. These parameters have been shown to be elevated at MW14 owing to leachate influence. Ammonia concentrations are elevated at MW204; however, similarly elevated concentrations are also noted at other new bedrock wells which indicate similar natural mineralization as MW204 (MW202 & MW203) indicating the ammonia, as well as other parameters (boron, fluoride, selenium and sulphate) are naturally sourced within the bedrock. This differential in quality would indicate that the bedrock fracture plane targeted at MW14 is not laterally extensive such that migration of leachate impacts within the bedrock to the north east is likely limited to within the road alignment. This lack of laterally extensive bedrock fracture plane is further supported by the fact MW204 had a much slower response following purging indicating it is likely not hydraulically connected to the same bedrock fracture plane as that at MW14.



Table 3: Average Leachate Indicator Parameter Concentrations – Overburden

Parameters	ODWQS	Background	Leachate	Downgradient Monitoring Wells							
		MW13	MW-17	MW1-I	MW1-II	MW2-II	MW7	MW10-II	MW11	MW12	MW16-III
Alkalinity	500	201	2287	552	666	286	204	277	300	219	214
Ammonia		0.3	202	0.4	4	0.4	0.3	0.4	0.2	0.7	0.4
Barium	1	0.1	1	0.2	0.2	0.2	0.03	0.1	0.2	0.02	0.1
Boron	5	0.01	9	0.01	0.04	0.2	0.01	0.1	0.03	0.03	0.01
Calcium		96	442	207	228	114	82	86	123	87	72
Chloride	250	50	369	1	3	39	2	11	12	6	11
DOC	5	4	98	6	18	7	6	2	8	4	2
Iron	0.3	0.01	25	4	20	0.1	0.02	0.01	0.2	0.02	0.03
COD		15	760	48	255	27	11	13	33	10	43
Hardness	500	251	1365	568	615	358	214	301	328	229	234
Manganese	0.05	0.002	2	2	2	0.03	0.01	0.001	0.2	0.01	0.002
Potassium		0.4	190	3	4	3	0.3	4	3	0.4	2
Sodium	200	6	387	2	3	7	1	11	5	2	5
TDS	500	281	3000	549	657	373	214	316	337	233	236
TKN		1	244	1	9	1	1	1	1	3	1

Average concentrations between 2021 and 2025

Bold and highlighting indicates ODWQS exceedance

All results in mg/L



Table 4: Average Leachate Indicator Parameter Concentrations – Bedrock

Parameters	ODWQS	Background		Leachate	Downgradient Monitoring Wells									
		MW5-I	MW202	MW-17	MW8-I	MW8-III	MW9	MW14	MW15	MW16-I	MW16-II	MW201D	MW203	MW204
Alkalinity	500	237	205	2287	471	344	294	571	250	192	187	234	144	163
Ammonia		0.2	1	202	0.5	1	1	0.5	0.2	0.3	1	1	2	1
Barium	1	0.1	0.02	1	0.2	0.1	0.03	0.3	0.04	0.03	0.04	0.04	0.02	0.03
Boron	5	0.1	0.4	9	0.02	0.1	0.1	0.04	0.1	0.01	0.01	0.1	4	2
Calcium		99	80	442	174	130	117	244	103	78	72	97	165	204
Chloride	250	8	30	369	5	7	10	63	2	4	4	16	738	166
DOC	5	5	3	98	5	6	7	7	3	5	5	6	1	2
Iron	0.3	0.1	0.1	25	6	2	0.1	9	0.02	0.2	0.01	0.4	0.2	0.04
COD		13	7	760	8	12	45	23	7	13	7	28	18	11
Hardness	500	266	271	1365	495	357	305	661	275	206	191	269	834	718
Manganese	0.05	0.04	0.01	2	1	0.4	0.01	2	0.003	0.02	0.001	0.1	0.03	0.01
Potassium		1	3	190	2	2	0.5	2	1	0.4	0.4	1	14	7
Sodium	200	5	18	387	3	6	5	23	1	2	2	12	615	106
TDS	500	267	344	3000	480	363	311	717	276	205	196	307	2678	1179
TKN		1	1	244	1	1	2	1	0.4	1	1	1	2	1

Average concentrations between 2021 and 2025

Bold and highlighting indicates ODWQS exceedance

All results in mg/L



Given the leachate impacts are found to be quite diluted at MW14 relative to MW17 and not observed further northeast of MW14 at MW204, the horizontal extent of leachate in this direction does not extend beyond the City owned lands (*i.e.*, road allowance).

Graphs illustrating the concentrations of a few select leachate indicator parameters over time have been provided for all monitoring locations with a sufficient data set in Appendix G. For reference purposes, the entire geochemical database has been appended in Appendix E. As indicated above, both the calcium and bicarbonate (*i.e.*, alkalinity) dominate the graphical depictions.

As can be observed in these graphs, the ground water chemistry has remained relatively consistent for the period of record; especially for the monitors with background chemistry. Some variability is noted; however, the concentrations generally fall within a predictable range. Some exceptions have been noted historically including slight increasing trends for chloride, calcium, alkalinity, barium, COD, DOC at MW10-II, although many of these parameters have begun to stabilize or decrease recently. It is likely that the slight increasing trends were the result of increased mounding in the north section of Area 2, which occurred in line with the timing of the upwards trends. MW11 showed increasing trends for COD, DOC, manganese, potassium, and TKN in 2011, however, have since subsided or remained consistent since then. Similarly, these trends may be related to the leachate mounding, which may have increased leading up to 2011 with the increase in elevation of the waste mound. As well, the active waste area may have extended closer to MW11 during the similar period. With the more recent stabilized water quality, it would indicate that the leachate mound has stabilized or is possibly decreasing due to the areas being capped. This is evident in the ground water elevation data collected at MW17 since its installation in 2016. These trends are important as they would support a lack extensive leachate migration to the northeast and the recent stability would suggest that increased concentrations off-site to the northwest are unlikely given the active waste area has shifted to the southwest portion of Area 2.

Finally, nitrate has been noted to be elevated at a few locations at the Site, although the concentrations have been found to be variable over time as well across the Site. However, these conditions have been observed in both leachate (MW2-II & MW11) and non-leachate impacted (MW10-II & MW203) locations, such that it is not a defined leachate indicator parameter. Concentrations have been increasing for the period of record at MW10-II, but have become more stable since 2018 (~2-3 mg/L). Given the presence in historically non leachate impacted monitor (MW2-II) and its historical variability, it is not viewed as a concern or an indicator of an overall shift in leachate conditions at the Site.



MW2-II has indicated increasing trends for most leachate indicator parameters since 2022, which is somewhat expected given its proximity to the active waste cell which began to be filled at that time.

Overall, although short term variance is still observed at the Site, no definite trends are observed in 2025 that would indicate there is an increasing contribution of leachate to the surrounding environment or any significant impact to the environment off site. The trends at MW2-II are likely localized, while there is a 300 m separation distance between MW2-II and the downgradient property boundary to the southeast. As such, adequate attenuation is expected to occur within the current site boundaries.

In addition to the above assessment, all 2025 values were compared to ODWQS chemistry summary tables (Appendix E). The exceedances included alkalinity, aluminum, boron, chloride, DOC, hardness, boron, iron, manganese, sodium, sulphate and TDS. However, the majority of these exceedances beyond the monitoring wells with defined leachate influence (*i.e.*, MW1-II, MW2-II, MW8-III, MW11, MW17 and MW14) are related to natural sources as the parameters and concentrations are observed at similar concentrations in both the background and downgradient locations. It is also noted that some of the more elevated concentrations are found in background bedrock locations MW203 & MW204, which has natural mineralization creating elevations of TDS, sulphate, chloride, sodium and boron.

5.3 Surface Water

5.3.1 Surface Water Flow

The monitoring program as it exists, is in place to assess potential leachate influence in the downgradient area to the northwest of the waste mound and includes three monitoring locations: SWD (upstream), SWA & SWB (downstream). These monitoring points are used to assess whether there are any impacts to the wetland area and associated pond immediately north of the waste mound.

5.3.2 Surface Water Quality

Table 5 summarizes average concentrations of leachate indicator parameters for the last five years between up and downstream monitoring locations that surround the landfill.

As can be observed in this summary table as well as the 2025 results (Appendix E), there is not any discernible difference between the up- and downstream locations with the exception of a marginal increase in ammonia and alkalinity concentrations in the downstream locations, which may be the result of a more limited dataset for the upstream location relative to the



downstream locations and a singular event in May 2023 where ammonia concentrations were more elevated in the downstream locations and no sample was collected at the upstream location. Given that monitoring event did not show elevations for other LIPs, the ammonia concentrations were considered anomalous. It is noted that the SWD data did not include any values between 2018 - 2023 as this location was noted to be dry during all monitoring events of this period.

The 2025 results were also compared to PWQO as is standard for surface water quality evaluations. Zero surface water exceedances of PWQO were noted in 2025; however, its important to note all locations were dry in the fall of 2025.

Table 5: Average Leachate Indicator Parameter Concentrations – Surface Water

Parameters	PWQO	Upstream	Leachate	Downstream	
		SWD	MW-17	SWA	SWB
Alkalinity		167	2287	172	182
Ammonia		0.2	202	0.6	0.4
Barium		0.02	1	0.01	0.01
Boron	0.2	0.01	9	0.01	0.01
Calcium		73	442	69	72
Chloride		3	369	2	2
DOC		6	98	6	6
Iron	0.3	0.04	25	0.04	0.01
COD		10	760	11	14
Hardness		192	1365	183	195
Manganese		0.005	2	0.003	0.002
Potassium		0.4	190	0.4	0.4
Sodium		2	387	1	1
TDS		183	3000	181	190
TKN		1	244	1	1

Average concentrations between 2021 and 2025

Bold and highlighting indicates PWQO exceedance

All results in mg/L

Given the consistency in water quality between the upstream and downstream locations, as well as the lack of PWQO exceedances directly attributable to the landfill operations, the surface water downgradient of the landfill is un-impacted by the landfill operations.

For reference, surface water photos for all locations have been included in Appendix G



5.4 Organic Sampling Results

As part of the monitoring program in 2025, volatile organic compounds (VOC) samples were to be collected from all monitoring wells during the fall monitoring events. As such, in 2025 samples were collected from MW1-I, MW2-II, MW10-II, MW13, MW14, MW15, MW16-III, MD201D, MW202, MW203 & MW204. Only a single detection for vinyl chloride at MW2-II (0.4 µg/L) was observed in 2025, which was below the ODWQS value of 1 µg/L. Historically, there is a weak organic presence within the landfill which is not unexpected, but the data indicates that this is mainly limited to the waste mound and proximal locations to the waste mound. Despite the limited VOC presence, continued monitoring of these parameters at the Site would be prudent., although could be curtailed to target locations within and immediately surrounding the waste areas (MW2-II, MW7, MW8-III, MW11, MW14 & MW17).

5.5 Graphical Analysis

An alternate evaluation technique (to identify unique waters) is to compare the major ion chemistry of different waters or waters that have been mixed with two or more sources (*i.e.*, leachate, ground water, surface water). A comparison was done of the ratios of major ion constituents. The assessment of ratios and plotting on a Piper diagram will show the consistency of the geochemical signatures and trends that demonstrate mixing. (Appendix H).

The data indicates consistency across the monitoring network with a carbonate dominated water signature. The most notable deviation is at MW17, which indicates a much different signature given it is the leachate monitor with significant elevations in most leachate indicator parameters. Finally, mineralized bedrock water quality is present at MW203 and MW204. This signature is much different to both the background and leachate signatures. Based on the overall water quality results from these locations, it would appear they are influenced by a naturally mineralized bedrock water source. The surface water shows a similar carbonate water quality signature, very similar to that from the ground water indicating the surface water is connected to the ground water. Overall, the lack of significant leachate influence at the remaining monitoring wells is consistent with the overall geochemical interpretation which is leachate is not causing an impact off site.

5.6 Reasonable Use Policy

Calculations with respect to MECP's Reasonable Use Policy (RUP) B-7 were performed using the 2025 monitoring program results at MW13 for the overburden and MW5-I for the bedrock as the background monitors.



The MECP's Reasonable Use Policy states that, in accordance with the appropriate criteria for particular uses, a change in quality of the groundwater on an adjacent property will be accepted only as follows:

The quality cannot be degraded by an amount in excess of 50% of the difference between background and the Ontario Drinking Water Standards for non-health related parameters and in excess of 25% of the difference between background and the ODWS for health-related parameters. Background is considered to be the quality of the groundwater prior to any man-made contamination.

MOE Procedure B-7-1. (MOE, 1994a)

The maximum concentration of a particular contaminant that is considered acceptable in the ground water beneath an adjacent property is calculated in accordance with the following relationship:

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

where:

- C_m = maximum concentration accepted
- C_b = background concentration
- C_r = Maximum concentration permitted in accordance with the Ontario Drinking Water Quality Standards
- x = a constant that reduces the contamination to a level that is considered by the MECP to have a negligible effect on water use.
i.e., 0.5 for non-health related parameters
0.25 for health-related parameters.

In 2025, the RUP values were calculated using the values of the background concentration (C_b). The maximum allowable concentration (C_m) of any particular parameter was calculated using the background concentration of that parameter from a monitor upgradient of the Site, the designated ODWQS value for that parameter, and a constant that reflects whether the parameter is health or aesthetic-related as defined by the ODWQS. Where background concentrations were less than the laboratory method detection limit, the method detection limit was used as the background value. The calculated C_m values for the Site were set as the RUP values.



As this assessment is based on compliance at the downgradient property boundaries, MW10-II, MW11, MW204 and MW16-I/II/III were used for compliance to the north and east, MW15 was used for compliance with the north and MW12 and MW203 were used for compliance to the west. It is noted that with MW204 now constructed, it replaces MW14 as the compliance well for the northeast corner of the Site. Specific exceedances for RUP are illustrated in the summary chemistry tables (Appendix E).

As with previous years, a number of parameters have exceeded RUP and are summarized in the following table.

Table 6: Reasonable Use Exceedance Summary Table

Location	Boundary	Screened Unit	Parameter	ODWQS	RUP	Concentrations Exceeding RUP*	
						Spring 2025	Fall 2025
MW10-II	East	Overburden	No Exceedances				
MW11	Northeast	Overburden	Iron	0.3	0.15	<u>0.297</u>	Dry
			DOC	5	4.6	<u>6.5</u>	Dry
			Manganese	0.05	0.026	<u>0.205</u>	Dry
MW12	West	Overburden	No Exceedances				
MW15	North	Bedrock	No Exceedances				
MW16-I	East	Bedrock	No Exceedances				
MW16-II	East	Bedrock	No Exceedances				
MW16-III	East	Overburden	Aluminum	0.1	0.074	0.14	0.02
			Iron	0.3	0.15	0.16	<0.005
MW203	West	Bedrock	Boron	5	1.3	4	4.41
			Chloride	250	150	<u>816</u>	<u>797</u>
			Hardness	500	388	<u>904</u>	<u>895</u>
			Fluoride	1.5	0.45	<0.7	1.1
			Iron	0.3	0.20	0.235	0.101
			Sodium	200	103	<u>627</u>	<u>627</u>
			Sulphate	500	254	<u>1,230</u>	<u>1,240</u>
			TDS	500	390	<u>2,540</u>	<u>3,050</u>
MW204	Northeast	Bedrock	Hardness	500	388	581	<u>961</u>
			Boron	5	1.3	1.13	1.88
			Chloride	250	129	124	215
			Aluminum	0.1	0.078	0.04	0.13
			Sodium	200	103	79.1	139
			Sulphate	500	255	410	<u>741</u>
			TDS	500	390	<u>793</u>	<u>1,540</u>

Notes: All values are in mg/L

* - Concentrations in bold exceed RUP and Underline for ODWQS



The majority of these parameters are not directly related to the landfill and most likely represent variation of naturally occurring earth elements as they are found to be significantly elevated in the background locations. The more notable exceedances for naturally occurring earth elements are for iron, manganese and hardness in the bedrock (MW5-I) and hardness in the overburden (MW13) which are significantly elevated above ODWQS in the background water quality. As such, these parameters should not be utilized in the RUP evaluation for the Site in the aquifer that they are naturally elevated and not related to landfill leachate.

The most significant and numerous exceedances were found at MW203 and MW204; however, these locations have been determined to be sourced to naturally mineralized water quality. It is also noted that the water quality at these locations are notably absent of elevations for a number of more prominent leachate indicator parameter such as DOC and manganese, which have been shown to be elevated at MW14, located closer to the waste mound. This would indicate that the bedrock fracture plane targeted at MW14 is not laterally extensive such that migration of leachate impacts within the bedrock to the north east is likely limited to within the road alignment. Similar conditions exist to the southwest at MW203. Given MW203 and MW204 have much slower responses following purging would indicate they are likely not hydraulically connected to a similar bedrock fracture plane as that at MW14. As such, the RUP exceedances noted at MW203 and MW204 are not attributable to the landfill.

Although MW11, which is the most north-easterly monitoring location in the overburden has shown RUP exceedances, a new overburden compliance location could not be installed further northeast in the same location as MW204 due to limited thickness (3 m) and unsaturated overburden conditions. This is mainly due to a topographic dip between MW11 and MW204 of approximately 3.7 m such that the shallow overburden aquifer is not present beyond the City Road allowance. Given these conditions, it is determined that the Site meets RUP with respect to both overburden and bedrock quality at the north-eastern property boundary. Furthermore, given the more regional flow patterns in the shallow overburden is towards the west and northwest, the impact is likely localized in the area of MW11. Monitoring well nest MW16 only indicates RUP exceedances for iron and aluminum in the overburden interval during the April monitoring event, which is the first time for iron, while aluminum has exceeded on occasion. However, given both concentrations were below limits in October, are considered natural earth elements and overall water quality at this location does not indicate leachate influence, the exceedances are not attributable to the landfill.

Finally, the MECP had indicated historically that the current bedrock background location (MW5-I) is currently adequate, but may need to be removed as a background location if



leachate influence begins to be observed based on its location adjacent to the current waste cell. As such, the defined background bedrock location will be adjusted as needed and likely could utilize one or more of the new wells or older monitoring wells (such as MW16-I), if this location continues to show background water quality (*i.e.*, no leachate influence).

5.7 Trigger Mechanism Program

The following trigger mechanism and contingency plan were approved by the MECP in 2020 as part of the recent ECA amendment which includes both ground and surface water triggers.

5.7.1 Trigger Locations

The ground water trigger locations include MW16-I/II/III, MW204 to assess compliance to the east and northeast. MW15 was established as a compliance location for the northern property boundary and MW12 for the western property boundary. MW201, MW202 & MW203 are used for southern compliance points. These locations are shown in Figure 2.

Surface water trigger locations are established to assess potential surface water flow through potential migration pathways that surround the Site. SWA is the closest monitoring location to the northwest of the waste mound within the pond that potentially represents a local ground water discharge point for leachate impacted flow. As per Conditions 40 & 41 of the amended ECA for the Site, additional surface water locations were requested to be established south and possibly west of the new waste area. However, during a Site walk completed during April 2018, there were no areas west or south of the waste area that would represent surface water features. The closest location to the southeast that could be targeted for sampling would be at SWD, which is an existing surface water location which regularly has insufficient water for sample collection. Similarly, the local topography in the area to the west of the new waste area and the historic waste area (Area 1) are such that there is no standing water present. The local topography in this area is expected to direct any surficial flow to the north where the pond is located such that SWA and SWB already represent optimum surface water monitoring locations.

Given these conditions, SWA is being assigned as the surface water trigger location as it would be the most representative location where leachate impacts would be first detected.

5.7.2 Trigger Parameters

Trigger parameters were chosen by comparing water quality data with that of the leachate quality data. The following concepts were considered when selecting the suite of trigger parameters:



- Trigger parameters are those typically found at low concentrations in background (un-impacted) surface and ground water and in elevated concentrations in leachate;
- Ideally, the difference in the compliance criteria, such as reasonable use, Ontario Drinking Water Quality Standards (ODWQS), Provincial Water Quality Objectives (PWQO), and / or Canadian Water Quality Guidelines (CWQG) for the selected trigger parameter and the background concentrations should be sufficient enough to enable the determination of upward trends with confidence by identifying a sustained increasing trend in concentrations which is not simply due to the inherent and / or seasonal fluctuation in the data. Under ideal conditions, the trend is detectable well before the parameter approaches compliance limit which then would permit effective mitigation if warranted; and
- The suitability of the parameter to serve as an indicator parameter is also considered (*i.e.*, its mobility, persistence, and presence or absence relative to compliance value). The reader is referred to the MECP's February 1994 document that describes attenuation mechanisms (MOE, 1994). Adequacy of available data and the degree of fluctuation in analytical results were considered in selecting the trigger parameters.

All parameters with an associated RUP value were included as trigger parameters for ground water, although for a trigger exceedance to apply, it must be found to be attributable to leachate versus natural sources or that an upward trend is observed supporting a non-natural source. Surface water parameters include alkalinity, ammonia (un-ionized), zinc, chemical oxygen demand (COD) and dissolved organic carbon (DOC). Although some of these parameters do not have an associated PWQO, their inclusion was based on their perceived presence within leachate and potential for variance owing to leachate rather than natural sources.

5.7.3 Tier I – Routine Monitoring

The Reasonable Use Policy (RUP) was used to calculate a trigger concentration for the ground water. RUP values are typically derived from the Ontario Drinking Water Quality Standards (ODWQS) (MOE, 2003). The RUP guideline limits the concentration increase of ground water leaving the property to be 50% of the difference between background concentrations and the ODWQS for non-health related parameters, while health related parameters cannot exceed 25% of the difference. For reference and in keeping with background reference locations utilized historically at the Site, MW13 is utilized for the overburden and MW5-I for the bedrock background reference locations.



In order to trigger action prior to a RUP non-compliance situation (landfill derived), the trigger values have been set to 75% of RUP for all boundary locations (MW15 – north, MW16 – east and proposed well constructions), while any location (*i.e.*, MW202, MW203 and MW12), where a more significant setback is present (~200 m), then 100% RUP values would be utilized. It is noted that these trigger values have been included in the appended chemistry summary tables for both overburden and bedrock locations.

For surface water, the approach is more specific and is based on average concentrations at SWA with a 2x standard deviation (MECP generated) applied to establish the trigger concentration. The exceptions are for un-ionized ammonia which is just related to 50% of the PWQO value, while the proposed zinc value is equivalent to PWQO. These values as proposed by the MECP surface water reviewer are presented in the following table.

Table 7: Surface Water Trigger Concentrations

Trigger Parameter	Trigger Concentration (mg/L)
Alkalinity	235
Un-Ionized Ammonia	0.01
Zinc	0.02
Chemical Oxygen Demand (COD)	30
Dissolved Organic Carbon (DOC)	13

5.7.4 Tier II – Confirmatory Monitoring

The trigger mechanism for the ground water is designed such that any parameter trigger exceedance with an upward trend noted over three consecutive events would lead to a data review to assess whether the exceedance is related to landfill or natural sources / variation. In the event the exceedance is not attributed to the landfill, no actions are required beyond summarizing these exceedances in the annual report. If the trigger exceedance and upward trend (3 consecutive events) are determined to be directly related to the landfill, this would represent an action level.

The trigger mechanism for surface water is designed such that when any two trigger parameters exceed the associated criteria in two consecutive sampling events. All singular trigger exceedances would not require any action beyond a cursory review the overall data to assess any potential leachate trends present beyond the remaining trigger parameters. All trigger parameter exceedances should be discussed in the annual report even if the criteria for action have not been triggered.



If triggers are exceeded for either ground or surface water, the confirmatory monitoring program will be comprised of collecting samples from the monitoring location in question on two separate occasions over the following two-month period to further confirm the trending and potential leachate source. It is recommended that the samples being analyzed for the routine analytical package trigger in duplicate such that both the trigger parameters and other leachate indicator parameters can be assessed.

5.7.5 Assessment of Trigger Mechanism for 2025 Data

In 2025, trigger parameter exceedances within the ground water that had three consecutive trigger exceedances with increasing concentrations were observed for sulphate and TDS at MW203 (1,100 / 1,230 / 1,240 mg/L) and (2,490/2,540/3,050 mg/L) respectively, where the triggers were 103 mg/L for sulphate and 390 mg/L for TDS. Other locations had singular trigger exceedances, but not with three consecutive exceedances with increasing trending. However, these are considered naturally sourced to the mineralized bedrock water and not to the landfill. This is supported by the lack of other notable similarly elevated leachate parameters at well locations (MW8-I/III) in-between MW203. As such, the trigger program is not activated in 2025.

Similarly, the surface water trigger program did not have any trigger parameter exceedances in 2025.

5.8 Landfill Gas Monitoring

Landfill gas measurements were collected from all available monitoring wells and gas monitors during Site visits completed on April 21th and October 8th, 2025, as well as daily within the Site operations building when in use. Detections were limited to the following locations.

Table 8: 2025 Gas Detections

Location	Date	Concentration	
		Landfill gas (% Volume)	% LEL
MW1-II	Apr-25	>5	>100
	Oct-25	>5	>100
MW14	Oct-25	0.12	2
MW17	Apr-25	>5	>100
	Oct-25	>5	>100

LEL – lower explosive limits

* - detections represent values greater than 0.5% volume



The results indicate detections, with explosive limits only exceeded within the leachate well MW17 and MW1-II, which is not unexpected as these wells are screened within or immediately adjacent to waste. The source of the detections at MW14 is uncertain but may not be sourced to the landfill as similar elevations were not observed in the adjacent overburden location MW11 or the adjacent bedrock location MW16-I. As similar elevations at MW14 have been observed historically, it is possible they are representative of a deeper natural source within the bedrock that varies seasonally dependent on the fluctuating water levels and fracture saturation in the bedrock. Trace concentrations are observed on occasion at the surrounding monitors, but are not attributable to landfill gas and are considered to be reflective of natural organics within the soil that are registered as very low concentrations when measuring in parts per million (ppm) (*i.e.*, <50 ppm). Given the remote location of the Site and lack of measurable gas concentrations beyond the immediate area of the waste, continued gas monitoring is not considered warranted, aside from monitoring of on-site buildings.

For reference, gas measurement data has been compiled for the past eleven years and included in Appendix I.

6.0 SITE OPERATIONS

As the Site is active, it is accessed by the public at the main entrance gate and information signage exists which states the hours of operation, permitted users, and types of waste accepted at the Site.

The hours of operation for the Site in 2025 were:

Winter – October 16 to April 30

Monday, Friday, Saturday and Holiday Mondays: 9:00 AM to 5:00 PM

Summer – May 1 to October 15

Monday, Friday, Saturday and Holiday Mondays: 11:00 AM to 5:00 PM

6.1 2025 Site Maintenance & Activities

The Site inspection logs are included in Appendix J, which were completed by in April and October. The only items requiring action were that MW9 required repairs following the October monitoring event, and the recommended clearing of fallen trees over MW14, MW11 and MW7 wells. Beyond the Site inspections, there were no complaints or incidents related to the Site in 2025. MW9 was scheduled for repair in 2025 and consideration should be given to relocate this location further west outside the area that is seasonally flooded area such that the monitor can be sampled during the spring.



In August 2025, the City submitted and requested a priority review of an ECA application to for Somerville Landfill to allow for filling in cells 2D-2J. In December 2024, WSP completed a survey identifying 6,510 m³ of operational capacity remaining in the currently in-use cell 2C. Based on this survey and accessibility to operational areas from construction of the new cell 2D the City requested to overbuild waste in 2C in anticipation for it to be moved into cell 2D once approved. On September 26, 2025 the City received the approved ECA and on October 1, 2025, a Cell Preparation Report was submitted to the MECF as required by Condition 31 of the ECA. Formal notice was provided that Construction of Cell 2D was complete and will begin receiving waste, including the relocation of overbuilt waste from Cell 2C to Cell 2D. Eagleson Construction completed waste relocation and the as well as the construction of a gravel turnaround pad to support waste placement activities in the active landfill area by the end of November.

6.2 2025 Waste Volumes / Site Capacity

A topographic survey of the Site was completed by the City in December 2025, which was compared to a similar survey completed in December 2024 utilizing cut and fill calculations in AutoCAD to generate an annual volume estimate for 2025. A total of 6,425 m³ including waste and cover material was determined to be added to the Site in 2025. This fill rate was slightly above the five year annual average of 5,100 m³/year. This puts the current estimate for total waste volume at the end of 2025 at approximately 234,972 m³.

Condition 26 of the new ECA for the Site states that the total Site capacity including regular (interim) cover is 637,100 m³ (which includes approval of a minor capacity expansion). Given that ~234,972 m³ of waste and cover material is present at the Site as of December 2025, the remaining capacity of the Site is estimated to be 402,128 m³. Based on this remaining capacity and predicted annual fill rate of ~7,000 m³(Archibald Engineering, 2016), the Site has approximately 57 years of capacity left, assuming no changes to current Site operations or annual fill rates.

6.3 Recyclable Materials Summary

The Site operates as a waste disposal and recycling transfer site. According to City records, the following amounts of recyclable materials were received at the Site in 2025.



Table 9: Summary of Recyclable Materials Received in 2025

Item	Number of Units	Units
Paper	27	Tonnes
Containers	9	Tonnes
Leaf and Yard Waste	1,489	Tonnes
Electronics	23	Tonnes
Scrap Metal	67	Tonnes
Textiles	1	Tonnes

Based on the diversion quantities listed above, and 2,733 tonnes of waste received in 2025, the total divertible material received at the Site in 2025 was approximately 1,616 tonnes. Of the material received at the Somerville WDS, approximately 60% of the material was diverted.

6.4 Compost Operations

Compostable material (leaf and yard waste, tree trunks, stumps, branches, leaves and brush) is utilized as alternative daily cover at the Site. As in previous years, compostable material was deposited on designated clay fill pads in Area 3 where this material is passed through a grinder when a sufficient material is present or at least once per year.

The current ECA was amended on February 24, 2022 to reflect changes to increase the limits of daily and annual leaf and yard waste. The ECA was amended for the Site to not exceed 150 tonnes in any given day and not to exceed 2,000 tonnes annually. The Site may now also receive up to 400 tonnes of leaf and yard waste for 20 days (non-consecutive) in a calendar year without exceeding the total annual amount of 2,000 tonnes. It is noted that the daily and annual leaf and yard waste volumes for 2025 did not exceed the acceptable limits with the annual total being 1,489 tonnes and the total maximum daily amount received being 86 tonnes (Appendix K). Finally, it is noted that no compost was removed from the Site in 2025.

7.0 CONCLUSIONS

Based on the interpretation presented in the above sections, the environmental setting at the Somerville Landfill Site is well understood based on over 20 years of performance monitoring. The data trends over this monitor period have yielded a relatively consistent geochemical signature such that it is reasonable to infer that the Site reflects a steady state condition. This is supported by the general consistency between the 2025 data with the historic data set.

Ground water flow patterns also indicate similar conditions as previous years with an predominate northwesterly flow direction (from waste area) in the overburden and a



southwestern flow in the underlying limestone formation. Despite this overall flow path, MW17 drilled into the active waste area and the MW16 nest east of Ledge Hill Road along the drumlin would indicate that there is a localized amount of radial flow from the waste mound that is responsible for some elevated leachate indicator parameters along the northeastern property boundary (MW11 & MW14) and east of the current working area (MW2-II). Although these concentrations and flow patterns would suggest the potential for off-Site impacts to the northeast, as illustrated by a number of RUP exceedances in these areas, the lack of leachate impacts observed at MW16 would indicate this eastern migration is localized with minimal lateral extent in a northern direction beyond MW11 and MW14.

MW204, which is located 100 m past MW11 and MW14 has shown to be represented by naturally mineralized water quality with an absence of more prominent leachate indicator parameter such as DOC, iron and manganese which have been shown to be elevated at MW14 owing to leachate influence. This would indicate that the bedrock fracture plane targeted at MW14 is not laterally extensive such that migration of leachate impacts within the bedrock to the north east is likely limited to within the road alignment. Similarly, more regional bedrock flow patterns are noted to be in a westerly direction which would limit the extent of eastern flow associated with the localized or radial patterns derived from the waste mound and drumlin feature. It is also noted that the current active area of the Site is no longer in close proximity to MW11, MW14 and MW204. Finally, the water quality in the northeastern monitors (MW11 & MW14) has indicated stability in water quality such that the potential for changes in leachate impacts to the northeast are not expected to occur over time. This is supported by the reduced leachate mounding at MW17 which has lowered the gradients horizontal gradients in this area further limiting leachate migration to the northeast.

MW203, which is located ~200m past MW8-I/III has also shown naturally mineralized water quality with readings for sodium and sulphate historically being higher than wells MW8-I/III in-between the waste mound and the background well. Due to the values being higher the further you get to MW203 and the naturally high mineralization in the area, the RUP exceedances and trigger exceedances are not determined to be landfill derived.

Although MW11, which is the most north-easterly monitoring location in the overburden has shown RUP exceedances, a new overburden compliance location could not be installed further northeast in the same location as MW204 due to limited thickness (3 m) and unsaturated overburden conditions (*i.e.*, no shallow overburden aquifer present). This is mainly due to a topographic dip between MW11 and MW204 of approximately 3.7 m such that the shallow overburden aquifer is not present beyond the City Road allowance. Given these conditions, it is



determined that the Site meets RUP with respect to both overburden and bedrock quality at the north-eastern property boundary.

Beyond the northeastern end of the Site, Reasonable Use parameters continue to exceed at some of the locations along the eastern and western extents of the monitoring well network, although they are generally related to natural sources (iron, manganese, hardness) and highly mineralized waters unrelated to the landfill or have a sufficient lands to achieve attenuation (*i.e.*, distance from MW12 to western property boundary ~200 m) such that the exceedances do not warrant any further study or mitigation measures.

The trigger mechanism program included parameter exceedances for sulphate and TDS at MW203 with trigger concentrations exceeding with increasing trends over three monitoring events. However, it is noted that no other leachate indicator parameters were elevated and the sodium and sulphate concentrations were within the historical background range such that it was determined that they were not landfill derived. No other ground water or surface water triggers were exceeded such that the Site is in compliance with the trigger program in 2025.

Surface water quality at the Site continues to show no meaningful difference between historical upstream and current downstream locations therefore there is no indication of any leachate impact.

The gas monitoring program indicates the presence of methane within and immediately adjacent to the waste areas; however, only trace concentrations not related to the landfill were observed in the distant locations. Given the remote location of the Site and lack of measurable gas concentrations beyond the immediate area of the waste, continued gas monitoring is not considered warranted, aside from monitoring of on-site buildings.

8.0 RECOMMENDATIONS

The monitoring program recommended for 2026 is identified in Table 10 and is based on the current data set and Site understanding. The following represents the proposed 2026 monitoring program, which is similar to what was completed in 2025 with the exception of the reduction in VOC sampling locations, removal of MW203 and MW204 and the removal of gas monitoring. The limited VOC concentrations at the Site warrant only targeted sampling locations within and immediately downgradient of the waste. Continued gas monitoring is not warranted given the lack of measurable concentration beyond the waste area and lack of sensitive surrounding land use. It is noted that the reduction of VOC sampling and removal of MW203 and MW204 were approved by the MECP as part of their review of the 2025 annual



monitoring report (Appendix A). The removal of MW203 and MW204 was recommended by MECP due to the mineralized water quality and requirements of O. Reg. 903 that wells with naturally mineralized water need to be decommissioned. No comment has been received regarding previous recommendations for removal of the landfill gas monitoring program. For reduction in VOC sampling, removal of MW203 & MW204 and removal of the gas monitoring program, written approval from the MECP director is required.

Table 10: Proposed 2026 Monitoring Program

Monitoring Station	Frequency	Parameters
<u>Ground Water</u> MW1-I, MW1-II, MW2-II*, MW5-I, MW7*, MW8-I, MW8-III*, MW9, MW10-II, MW11 & MW12, MW13, MW14 &, MW15, MW16-I, MW16-II, MW16-III, MW17*, MW201, MW201D &MW202	Semi-Annual (April / May & September / October)	Biochemical Oxygen Demand (BOD), Volatile Organic Compounds (VOCs*), Dissolved Organic Carbon (DOC), alkalinity, ammonia, chloride, hardness, nitrate, sulfate, Total Kjeldahl Nitrogen (TKN), barium, boron, calcium, iron, magnesium, sodium, potassium, manganese, pH, conductivity, Total Dissolved Solids (TDS), Total Suspended Solids (TSS) (leachate only), Chemical Oxygen Demand (COD) * VOCs – annual during Fall event Water Level Measurements
<u>Surface Water</u> SWA, SWB & SWD	Semi-Annual (April / May & September / October)	BOD, phenols, Free cyanide, Total Organic Carbon (TOC), TKN, nitrate, nitrite, ammonia (total), alkalinity, hardness, chloride, phosphorous, sulphate, aluminum, arsenic, barium, boron, cadmium, calcium, chromium, copper, iron, lead, magnesium, mercury, nickel, potassium, selenium, silver, sodium, zinc, pH, conductivity, TSS, COD, colour, turbidity



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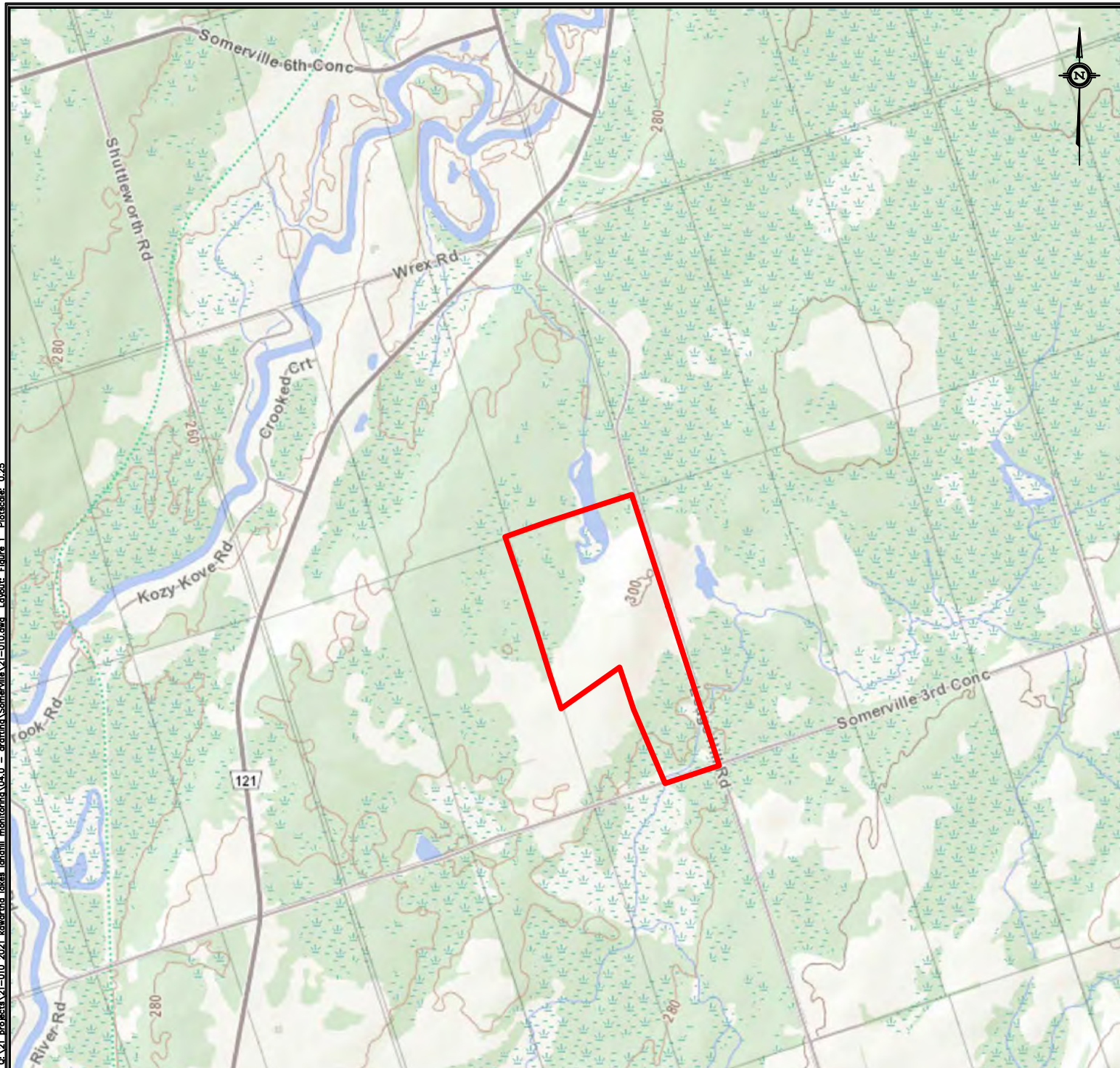


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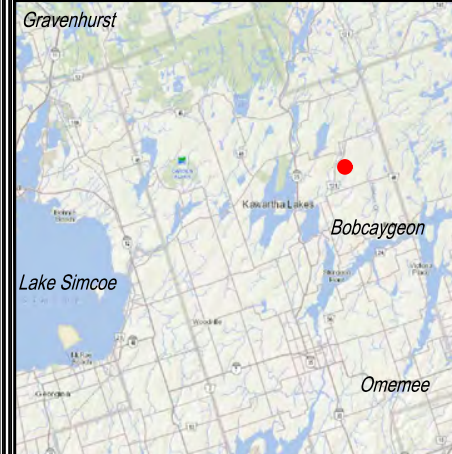
FIGURES

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LEGEND:

 *Approx. Property Boundary*



REG MAP

250m 0 750m
HORIZONTAL SCALE 1: 25,000



Study Area Location

Somerville Landfill,
City of Kawartha Lakes, ON

DATE ISSUED: March 2026

CREATED BY: JLM

PROJECT NO.: 26-010

REFERENCE: MNR

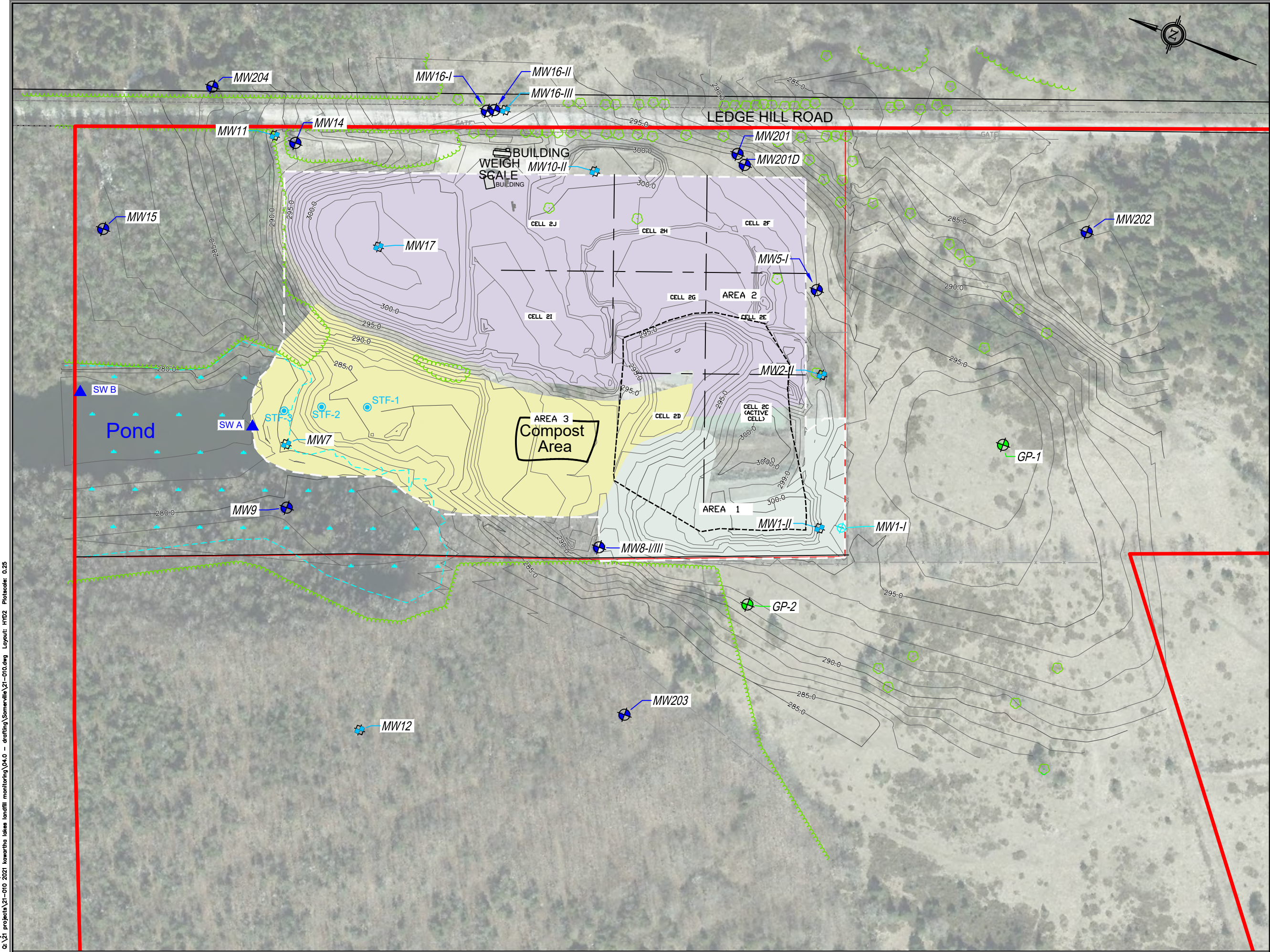
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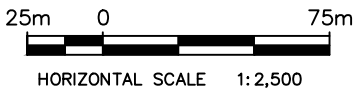
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 - 100 — 1m Contours
 - ⊕ Bedrock Monitoring Well Location
 - ⊕ Deep Overburden Multi-Level Monitoring Well Location
 - ⊕ Shallow Overburden Monitoring Well Location
 - ▲ Surface Water Locations
 - ⊕ Staff Gauge Location
 - ⊕ Gas Probe Locations
 - Approved Waste Disposal Area (White)
 - Limit of Ponding



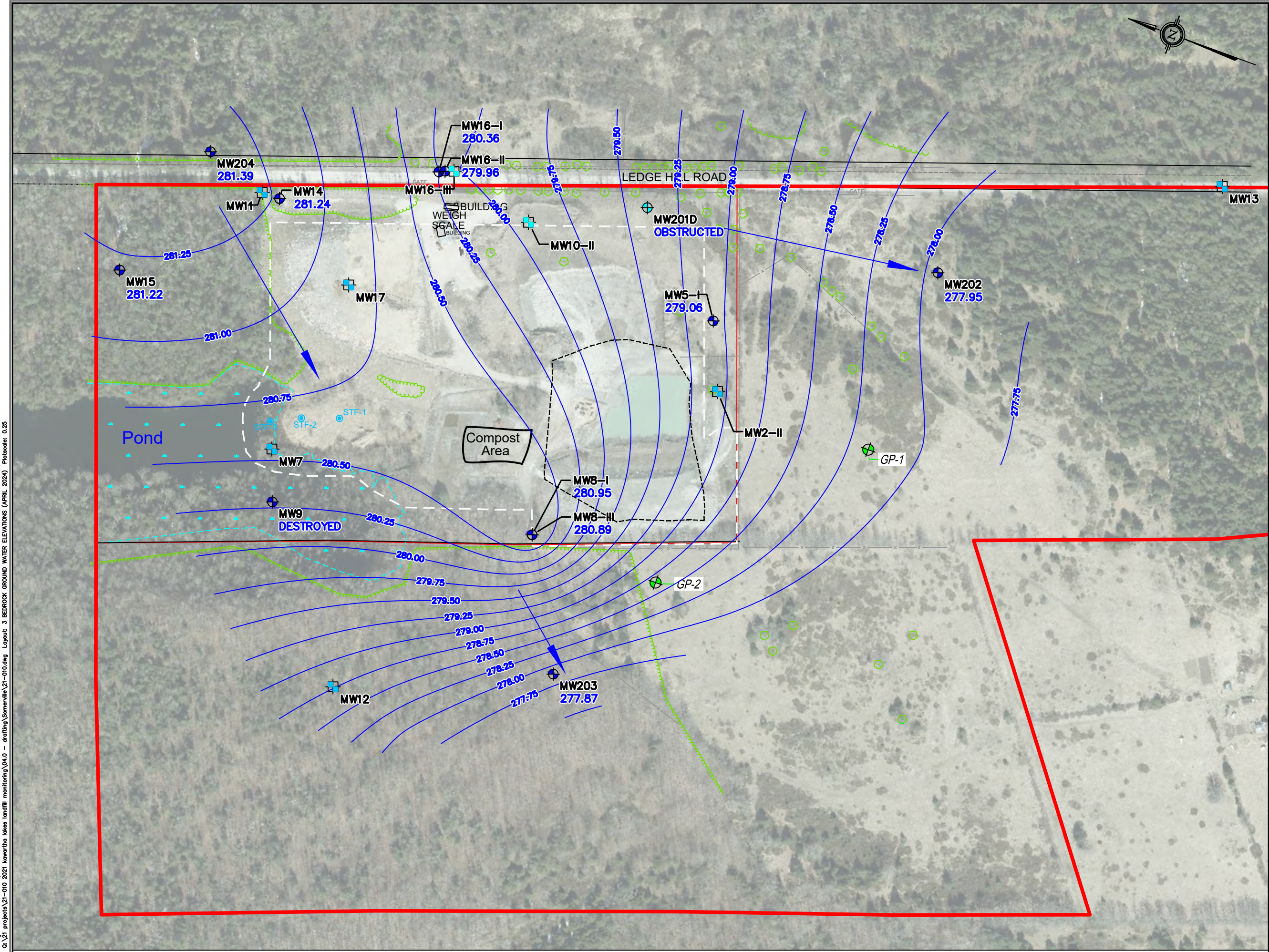
Site Layout

Somerville Landfill,
Kawartha Lakes, ON

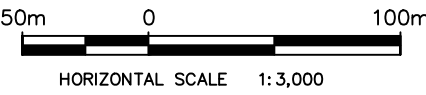
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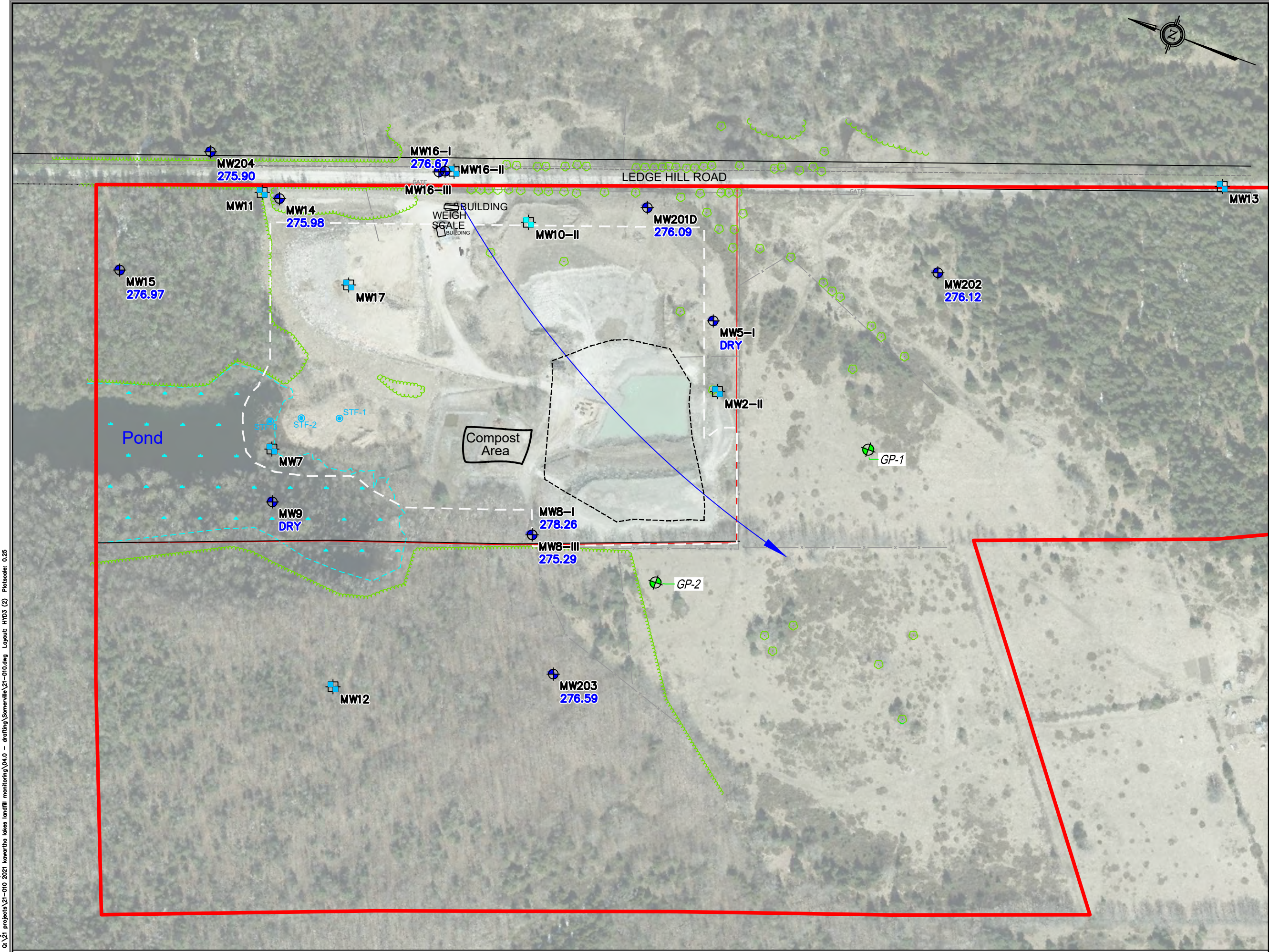
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 - Approx. Active Waste Area
 - Bedrock Monitoring Well Location
 - Deep Overburden Multi-Level Monitoring Well Location
 - Shallow Overburden Monitoring Well Location
 - Staff Gauge Location
 - Gas Probe Locations
 - Approved Waste Disposal Area (White)
 - Limit of Ponding
 - 0.25m Bedrock Ground Water Contours (April 2025)
 - Inferred Direction of Bedrock Ground Water Flow



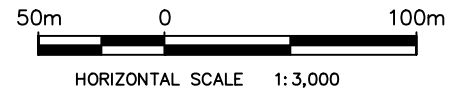
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Somerville Landfill, Kawartha Lakes, ON		
DATE ISSUED:	March 2026	Figure No. 3
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PROJECT NO.:	26-010	
REFERENCE:		

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 - - - - - Approx. Active Waste Area
 - ⊕ Bedrock Monitoring Well Location
 - ⊕ Deep Overburden Multi-Level Monitoring Well Location
 - ⊕ Shallow Overburden Monitoring Well Location
 - ⊕ Staff Gauge Location
 - ⊕ Gas Probe Locations
 - - - - - Approved Waste Disposal Area (White)
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 - ➔ Inferred Direction of Bedrock Ground Water Flow

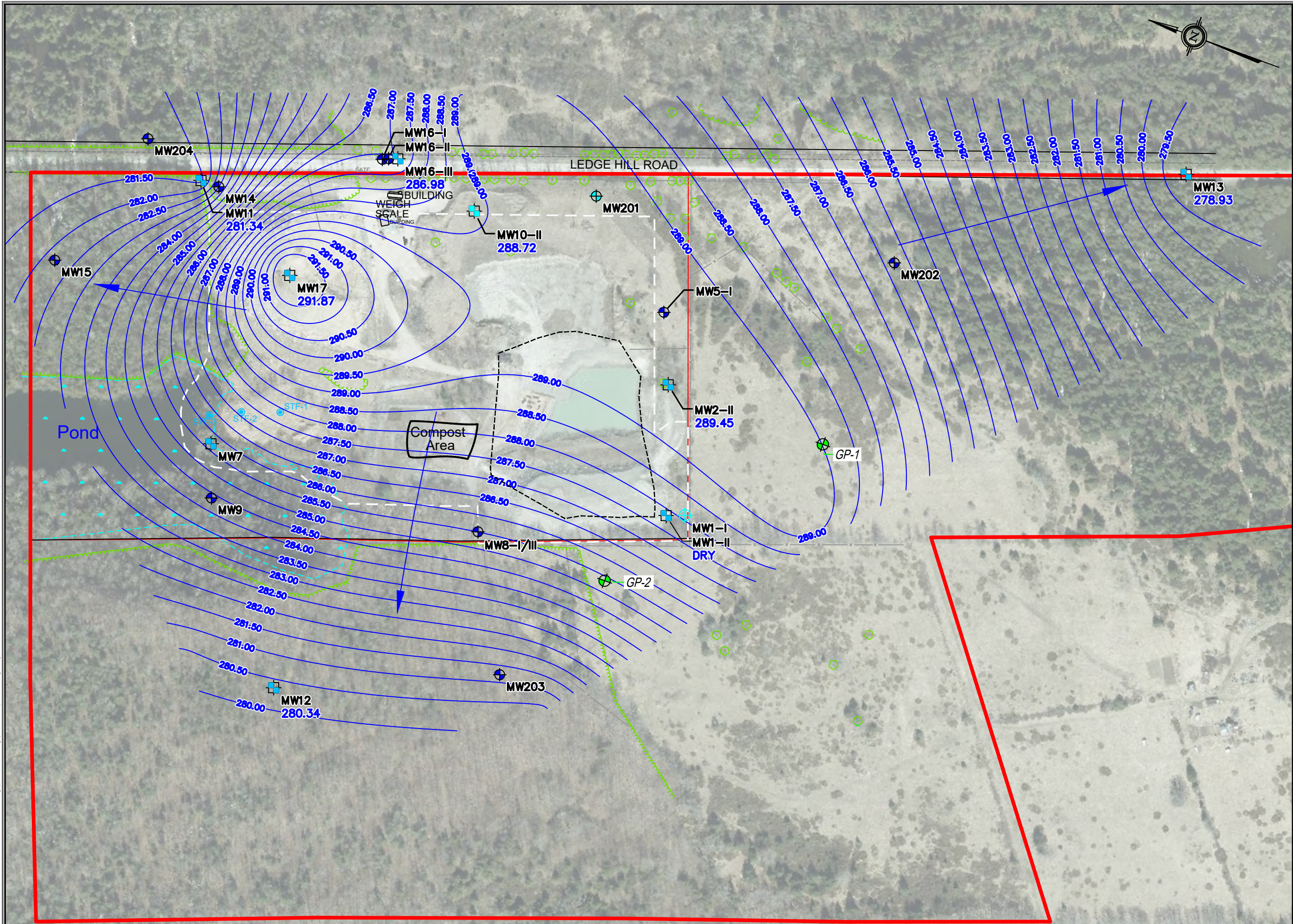


Bedrock Ground Water Elevations
(September 2025)

Somerville Landfill,
Kawartha Lakes, ON

DATE ISSUED:	March 2026	Figure No.
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PROJECT NO.:	26-010	
REFERENCE:		

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- LEGEND:**
- Approx. Property Boundary
 - Bedrock Monitoring Well Location
 - Deep Overburden Multi-Level Monitoring Well Location
 - Shallow Overburden Monitoring Well Location
 - Staff Gauge Location
 - Gas Probe Locations
 - Approved Waste Disposal Area (White)
 - Limit of Ponding
 - 0.50m Shallow Overburden Ground Water Contours (April 2025)
 - Inferred Direction of Bedrock Ground Water Flow



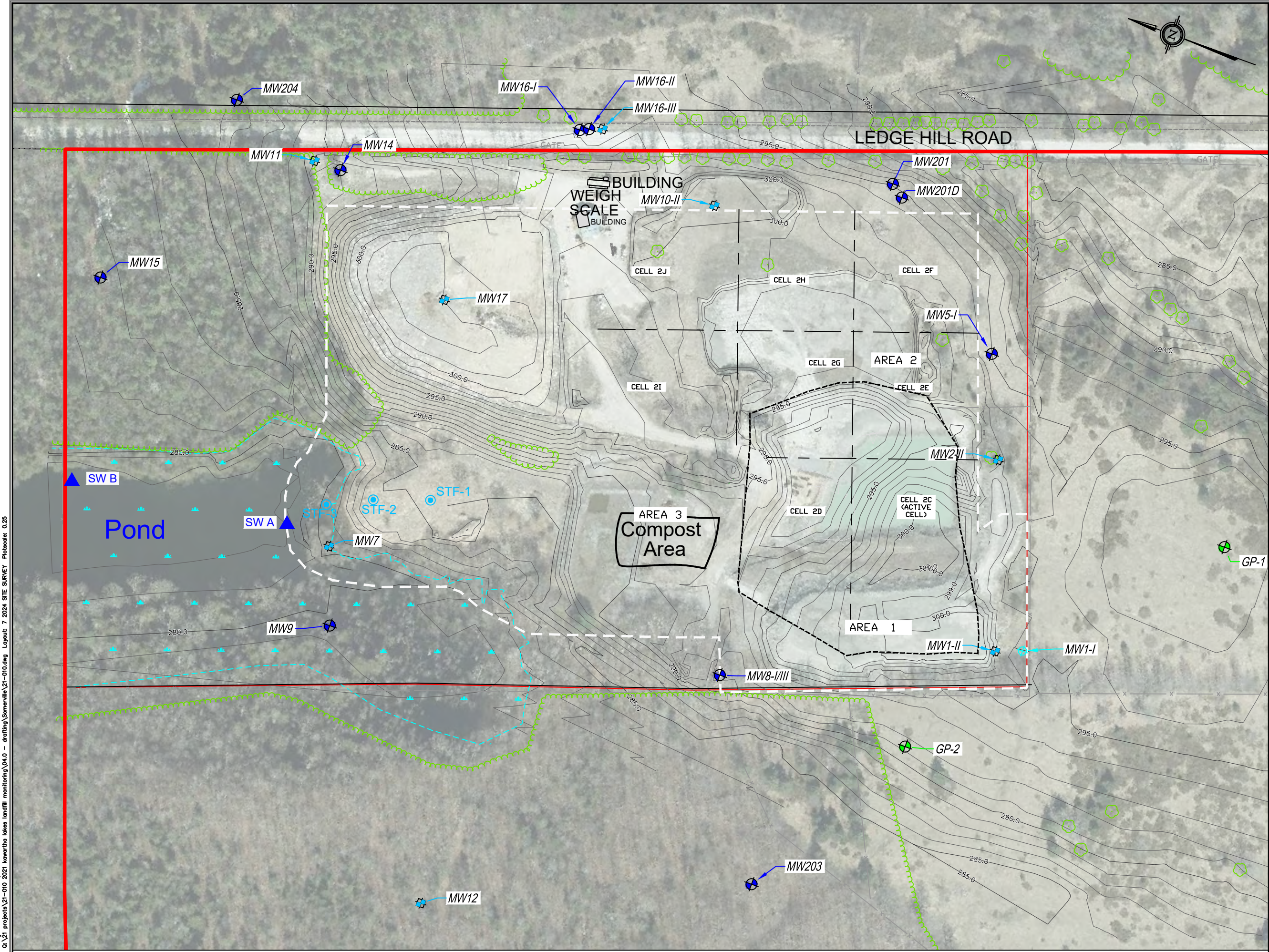
Shallow Overburden
Ground Water Elevations (April 2025)

Somerville Landfill,
Kawartha Lakes, ON

DATE ISSUED:	March 2026	Figure No.
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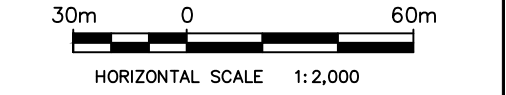
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- 5m Contours
- 1m Contours
- Bedrock Monitoring Well Location
- Deep Overburden Multi-Level Monitoring Well Location
- Shallow Overburden Monitoring Well Location
- Surface Water Locations
- Staff Gauge Location
- Gas Probe Locations
- Approved Waste Disposal Area (White)
- Limit of Ponding



**2025 Site Survey**

**Somerville Landfill,
Kawartha Lakes, ON**

DATE ISSUED:	March 2026	Figure No.
CREATED BY:	JLM	7
PROJECT NO.:	26-010	
REFERENCE:		



APPENDICES

Appendix A:	ECA
Appendix B:	Borehole Logs
Appendix C:	Ground Water Elevation
Appendix D:	Laboratory Certificate of Analysis
Appendix E:	Chemistry Summary Tables
Appendix F:	Chemistry Over Time Graphs
Appendix G:	Surface Water Photos
Appendix H:	Graphical Analysis
Appendix I:	Landfill Gas Tables
Appendix J:	Site Inspection Forms
Appendix K:	Yard Waste Quantity Summary
Appendix L:	MECP Landfill Reporting Submission Forms



APPENDIX A

ECA

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A321604

Issue Date: February 24, 2022

City of Kawartha Lakes
322 Kent St W
Kawartha Lakes, Ontario
K9V 4T7

Site Location: Somerville Landfill Site
381 Ledgehill Road, Lot 13, Concession 3, former Somerville Township
Kawartha Lakes City

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:

a waste disposal site consisting of a 13 hectare fill area within a total site area of 61.6 hectares.

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

"Act" means the Environmental Protection Act, R.S.O. 1990, C. E-19 as amended;

"Approval" means this Environmental Compliance Approval including all future Notices of Amendment;

"Coarse Leaf and Yard Waste" means leaf and yard waste that consists of tree trunks, stumps, limbs or other woody material in excess of 7 centimetres in diameter;

"Compost" means leaf and yard waste that has been composted and fully cured and tested to confirm it meets the criteria in Table 1 of O. Reg. 101. Compost is not considered a waste if testing for the compost quality criteria is completed and compliance with the criteria is demonstrated;

"Director" means the person(s) appointed for the purposes of Part II.1 of the Environmental Protection Act;

"District Manager" means the District Manager, Peterborough District Office of the Ministry;

"Ministry" means the Ontario Ministry of Environment, Conservation and Parks;

"Reg. 347" means Regulation 347 (General - Waste Management Regulation), R.R.O. 1990, under the EPA as amended;

"O. Reg. 903" means Ontario Regulation 903 (Wells), R.R.O. 1990, under the OWRA, as amended;

"O. Reg. 101" means Ontario Regulation 101 (Recycling and Composting of Municipal Waste), R.R.O. 1990, under the EPA, as amended;

"Owner" means City of Kawartha Lakes;

"OWRA" mean the Ontario Water Resource Act, R.S.O 1990, Chapter O.40;

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

"Partially Composted Leaf and Yard Waste" is leaf and yard waste which has not been composted in strict accordance with Sections 31 to 33 of Regulation 101/94, Part V- Leaf and Yard Waste Composting Sites and can not be defined as Compost.

"PWQO" means the Provincial Water Quality Objectives;

"RUP" means the Ministry's Reasonable Use Policy (Guideline B-7); and

"Site" means the entire 61.6 hectare waste disposal site, consisting of an 13 hectare landfilling area and the 50 m x 90 m composting area, and includes buffer lands and contaminant attenuation zone, located at 381 Ledgehill Road, City of Kawartha Lakes, legally described as Lot 13, Concession 3, former Somerville Township, approved by this Approval.

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

TERMS AND CONDITIONS

Compliance

- (1) (a) The Owner shall ensure compliance with all the conditions of this Approval and shall ensure that any person authorized to carry out work on or operate any aspect of the Site is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
- (b) The Owner shall ensure that the RUP is applied and met at all points on the property line which are impacted by leachate generated at the Site.
- (2) Any person authorized to carry out work on or operate any aspect of the Site shall comply with the conditions of this Approval.

In Accordance

- (3) Except as otherwise provided for in this Approval, the Site shall be designed, developed, built, operated and maintained in accordance with the original application for this Approval, the

conditions herein this Approval and the supporting documentation listed in Schedule "A".

Interpretation

- (4) Where there is a conflict between a provision of any document, including the application, referred to in this Approval, and the conditions of this Approval, the conditions in this Approval shall take precedence.
- (5) Where there is a conflict between the application and a provision in any documents listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the Ministry approved the amendment.
- (6) Where there is a conflict between any two documents listed in Schedule "A", other than the application, the document bearing the most recent date shall take precedence.
- (7) The conditions of this Approval are severable. If any condition of this Approval, or the application of any condition of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

Other Legal Obligations

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

Adverse Effect

- (9) The Owner shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the Site, including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.
- (10) Despite an Owner or any other person fulfilling any obligations imposed by this Approval the person remains responsible for any contravention of any other condition of this Approval or any applicable statute, regulation, or other legal requirement resulting from any act or omission that caused the adverse effect to the natural environment or impairment of water quality.

Change of Owner

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

- (a) the Ownership of the Site;
 - (b) the Operator of the Site;
 - (c) the address of the Owner or Operator;
 - (d) the partners, where the Owner or Operator is or at any time becomes a partnership and a copy of the most recent declaration filed under the Business Names Act, R. S. O. 1990, c. B.17, shall be included in the notification;
- (12) No portion of this Site shall be transferred or encumbered prior to or after closing of the Site unless the Director is notified in advance. In the event of any change in Ownership of the works, other than change to a successor municipality, the Owner shall notify the successor of and provide the successor with a copy of this Approval, and the Owner shall provide a copy of the notification to the District Manager and the Director.

Inspections

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

Information and Record Retention

- (14) (a) Any information requested, by the Ministry, concerning the Site and its operation under this Approval, including but not limited to any records required to be kept by this Approval shall be provided to the Ministry, upon request, in a timely manner.
- (b) Records shall be retained for 5 years except for as otherwise authorized in writing by the Director.
- (15) The receipt of any information by the Ministry or the failure of the Ministry to prosecute any person or to require any person to take any action, under this Approval or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:
- (a) an approval, waiver, or justification by the Ministry of any act or omission of any person that contravenes any term or condition of this Approval or any statute, regulation or other legal requirement; or
 - (b) acceptance by the Ministry of the information's completeness or accuracy.

- (16) The Owner shall install and maintain a sign at the main entrance/exit to the Site on which the following information is legibly displayed:
- (a) name of the Site and Owner;
 - (b) this Approval number;
 - (c) normal hours of operation;
 - (d) allowable and prohibited waste types;
 - (e) telephone number to which complaints may be directed; and
 - (f) twenty-four hour emergency telephone number (if different from above).
- (17) The Owner shall install and maintain signs at the Site to direct vehicles to the working face, the recycling bins and the other disposal or storage areas designated for wastes requiring special handling procedures.
- (18) The Owner shall take all practical steps to prevent the escape of litter from the Site. Weekly pick-up of litter at the Site and along the access road in the vicinity of the Site shall be carried out. Appropriate fencing shall be erected around the working area of the landfill as required.
- (19) During non-operating hours, the Owner shall ensure that the Site entrance and exit gate is locked and the Site is secured against access by unauthorized persons.
- (20) No waste shall be received at the Site except during the operating hours (Monday - Saturday, 7:00 am to 7:00 pm) when the Site is under the supervision of either trained Site personnel or the Owner's Environmental Supervisor or trained personnel.
- (21) The Owner shall ensure that all operators at the Site have been trained with respect to:
- (a) the terms, conditions and operating requirements of this Approval;
 - (b) the operation and management of all transfer, process, storage and contingency measures equipment;
 - (c) any environmental concerns pertaining to the Site and wastes to be transferred/processed; and
 - (d) relevant waste management legislation and Regulations under the Act and OWRA.
- (22) If at any time, the Owner receives complaints regarding the operation of the Site, the Owner shall respond to these complaints according to the following procedure:
- (a) The Owner shall record each complaint on a formal complaint form entered in a sequentially numbered log book. The information recorded shall include the nature of the complaint, the name, address and the telephone number of the complainant and the time and date of the complaint;
 - (b) The Owner, upon notification of the complaint shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and
 - (c) The Owner shall retain on-site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the re-occurrence of similar incidents.
- (23) The Owner shall promptly take all necessary steps to contain and clean up any spills which result from the

operation of the Site. All spills and upsets shall be immediately reported to the Ministry's Spills Action Centre at (416) 325-3000 or 1-800-268-6060 and shall be recorded in a written log or an electronic file format, referred to in Condition (45) of this Approval, as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences.

- (24) The Owner must conduct regular inspections of the equipment and facilities to ensure that all equipment and facilities at the Site are maintained in good working order at all times. Any deficiencies detected during these regular inspections must be promptly corrected. A written record must be maintained at the Site, which includes the following:
- (a) name and signature of trained personnel conducting the inspection;
 - (b) date and time of the inspection;
 - (c) list of equipment inspected and all deficiencies observed;
 - (d) a detailed description of the maintenance activity;
 - (e) date and time of maintenance activity; and
 - (f) recommendations for remedial action and actions undertaken.

Types and Quantities of Waste

- (25) The Site may receive only municipal waste as defined by O. Reg 347 that has been generated within the City of Kawartha Lakes. No liquid industrial wastes or hazardous wastes, as defined under O.Reg. 347 shall be accepted at the Site.
- (26) The total waste disposal capacity of the Site, including waste, daily, intermediate and final cover is 637,100 cubic metres.
- (27)
- (a) The Site may receive up to 150 tonnes per day of domestic, commercial and industrial waste for final disposal (landfilling) but the annual capacity shall not exceed 24,960 tonnes in a calendar year.
 - (b) In addition to the quantity of waste specified in Condition 27(a), the Site may also receive for a limited period of time an additional 400 tonnes per day of other solid, non-hazardous waste, limited to construction and demolition waste for final disposal. The Owner is required to provide written notification to the District Manager that specifies the expected duration of the increased disposal rate beyond eighty tonnes per day.
 - (c) In addition to the waste received for final disposal, the Site may receive, for composting, not more than 150 tonnes of leaf and yard waste in any given day;
 - (d) The total amount of leaf and yard waste accepted for composting annually shall be limited to 2,000 tonnes; and
 - (e) Notwithstanding condition 27(c) above, the Site may receive, for composting, up to 400 tonnes of leaf and yard waste for 20 days (non-consecutive) in a calendar year without exceeding the total annual amount of leaf and yard waste of 2,000 tonnes specified in condition 27(d).

- (28) The Owner shall ensure that no burning of waste occurs at the Site.
- (29) The Owner shall ensure that no scavenging is taking place at the Site

Landfill Operations

- (30) (a) At end of each operating day, the entire working face shall be compacted and covered with a minimum thickness of 150 mm of daily cover or alternate daily cover listed in Condition 30(b);
 - (b) The following materials are approved for use as alternative daily cover. The thickness of the material, with the exception of (v) must be at least 150 mm:
 - (i) Soil;
 - (ii) Wood chips;
 - (iii) Compost;
 - (iv) Partially composted leaf and yard waste from on-Site composting; or
 - (v) Steel plates
 - (c) In areas of the Site where landfilling has reached the final grade, a minimum thickness of 300 mm of intermediate cover shall be placed.
- (31) Following completion of landfilling in Areas 2A ad 2B as shown in Drawing F-6, Item (11) of Schedule "A", the Owner may commence landfill operations in Area 2C. Approval of the Director is required before landfilling can occur in Areas 2D through 2J.
- (32) No waste shall be placed above the final contours shown in the plans and specifications noted as part of Item (11) of Schedule "A".
- (33) The Owner shall ensure that all loads of waste are properly inspected by trained Site personnel prior to acceptance at the Site to prevent the acceptance of liquid industrial waste and hazardous waste and to prevent the acceptance of waste from outside the permitted service area. Waste vehicles shall be directed to the appropriate areas for disposal or transfer of the waste. The Owner shall notify the District Manager of load rejections at the Site within one (1) day from their occurrence.
- (34) The access road and on-site roads shall be provided and maintained so that vehicles hauling waste to and on the Site may travel readily and safely on any operating day. The Owner shall ensure that reasonable efforts are made to keep the access roads used by vehicles to leave the Site, free of waste.
- (35) No waste shall be landfilled within one (1) metre of the seasonal high water table and no waste shall be landfilled in ponded water at any time. The limits on the depth of fill shall be clearly marked within the fill area to ensure the minimum one metre separation distance is maintained.
- (36) Temporary berms and ditches shall be constructed around the active waste disposal area, as necessary, to prevent extraneous surface water from contacting the active working face.

Composting

- (37) (a) Waste accepted for composting or grinding/chipping shall be limited to leaf and yard waste, tree trunks, stumps, branches, leaves and brush.
- (b) Only leaf and yard waste that has been composted and cured in accordance with Sections 31 to 33 of Regulation 101/94, Part V - Leaf and Yard Waste Composting Sites, and can be defined as Compost, may leave the Site for use at other sites or by the general public.
- (c) All activities associated with the composting operations shall take place on the designated pad with measures in place to control storm water run off and leachate.
- (d) Leaf and yard waste segregated into fine material may not be stored for more than five days before it is placed in windrows.
- (e) Coarse Leaf and Yard Waste that is segregated for grinding/chipping shall be processed once per year at a minimum, or at another frequency approved by the District Manager.
- (f) Partially Composted Leaf and Yard Waste, wood chips and wood grindings may be used as alternative daily cover at the Site.
- (g) The Owner is permitted to use a mixture of Partially Composted Leaf and Yard Waste as interim cover. The mixture shall consist of 3 parts soil, one part screened Partially Composted Leaf and Yard Waste.
- (h) At a minimum, the Owner shall keep weekly records of all the operations related to composting (e.g. windrow turning, screening, sampling etc.), including quantities and source of leaf and yard waste received at the Site, and include this information in the Annual Report.

Environmental Monitoring

- (38) Groundwater, surface water and landfill gas monitoring shall be undertaken in accordance with Schedule "B". No changes to the groundwater, surface water and landfill gas monitoring programs shall be implemented prior to receiving a written approval of the Director.
- (39) By March 31, 2018, the Owner shall develop and implement a procedure to be used to detect unacceptable levels of landfill gas in the equipment shed.
- (40) The Owner shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.
- (41) Where landfilling is to proceed around monitoring wells, suitable extensions shall be added to the wells, and the wells shall be properly re-secured.
- (42) Any groundwater monitoring wells included in the on-going monitoring program that are damaged shall be assessed, repaired, replaced or decommissioned by the Owner, as required.
- (a) The Owner shall repair or replace any monitoring well which is destroyed or in any way made to be inoperable for sampling such that no more than one regular sampling event is missed.

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

Record Keeping and Reporting

- (43) The Owner shall maintain, at the Site for a minimum of two (2) years, a log book or electronic file format which records daily the following information:
 - (a) date of record;
 - (b) types, quantities and source of waste received;
 - (c) quantity and type of waste transferred;
 - (d) quantities and destination of each type of waste shipped from the Site;
 - (e) the amount of finished compost and/or rejected compost shipped from the Site;
 - (f) a record of daily inspections including the following information as a minimum; time and date of inspection, name and title of inspector, potential impacts noted, remedial actions taken, measures to prevent the problem from recurring;
 - (g) windrow temperature readings;
 - (h) composting activities undertaken (e.g. windrow formation, turning, screening etc);
 - (i) meteorological information including ambient temperature, wind direction and wind speed; and
 - (j) with respect to the compost sampling required by Condition 37, the Owner shall maintain the following records as a minimum: sample collection locations and volume of the samples collected, day and time of collection, sample handling procedures, parameters tested for and the resulting concentrations, name of the laboratory facility doing the testing, and conclusions drawn with respect to the results of the monitoring and testing.
- (44) By May 31st of each year, the Owner shall prepare and retain on-site an annual report covering the previous calendar year. Each report shall include, as a minimum, the following information:
 - (a) a detailed monthly summary of the type and quantity of all wastes received and transferred from the Site;
 - (b) a detailed monthly summary of finished compost transferred from the Site and the amount and destination of rejected compost;
 - (c) results and analysis of the required environmental monitoring which includes comparison of monitoring results to the approved trigger and RUG compliance limits for the Site and the PWQO;
 - (d) analytical results of samples taken from the finished compost;
 - (e) drawings showing the areas of fill, compost pad, buffer areas and current landfill contours;
 - (f) any environmental and operational problems, that could negatively impact the environment, encountered during the operation of the Site and during the facility inspections and any mitigative actions taken;
 - (g) a statement as to compliance with all conditions of this Approval and with the inspection and reporting requirements of the conditions herein; and

- (h) any recommendations to minimize environmental impacts from the operation of the Site and to improve Site operations and monitoring programs.

Closure Plan

- (45) The Company must submit, for approval by the Director, a written Closure Plan for the Site, two (2) years prior to closure of the Site. This plan must include, as a minimum, a description of the work that will be done to facilitate closure of the Site, a schedule for completion of that work as well as recommendations for post-closure monitoring and maintenance of the Site.

SCHEDULE "A"

This Schedule "A" forms part of Approval No. A321604.

- (1) Document entitled "Somerville Landfill Design and Operations Report" dated March 1998 and updated May 1998, prepared by the County of Victoria.
- (2) Document entitled "Report on Hydrological/Hydrogeological Conditions: Somerville Landfill, County of Victoria" dated December 1997, prepared by Golder Associates.
- (3) Letter dated July 22, 1999 to Waste Management Engineer, County of Victoria, from J. Robert Bruce, Hydrogeologist, MOE. Re: Somerville Landfill Site, Ministry Review Comments on the D&O and Hydrogeological Reports.
- (4) Letter dated March 30, 2000 to David Moy, County of Victoria, from Phil Moddle, Golder Associates Ltd. Re: Response to MOE Comments Hydrological/Hydrogeological Conditions.
- (5) Letter dated April 4, 2000 to Robert Bruce, MOE, from David Moy, Waste Management Engineer, County of Victoria. Re: County of Victoria Somerville Landfill A321604.
- (6) Letter dated January 3, 2003 to Chris Johnston, Senior Environmental Officer, MOE, from Stan Irwin, Manager of Environmental Services. Re: Compliance Inspection Report Somerville Landfill Site.
- (7) E-mail dated January 21, 2005, from Roberta Perdue, Waste Management Technician, The Corporation of the City of Kawartha Lakes, Environmental Services to David Lee, MOE. Re: Administrative error present of Somerville WDS Certificate of Approval.
- (8) Application for a Provisional Certificate of Approval for a Waste Disposal Site signed by Bill Pickard, Manager of Solid Waste Services, City of Kawartha Lakes, dated February 1, 2008.
- (9) Composting Facility at Somerville Landfill, Design and Operations Report, prepared by Totten Sims Hubicki Associates, prepared for the City of Kawartha Lakes, dated December 2007.
- (10) Letter from K. Dechert, Totten Sims Hubicki Associates, to Environmental Assessment and Approvals Branch, dated May 15, 2006, re: addendum to Section 6 of the Design and Operations report.
- (11) Document entitled "Somerville Landfill Site, Design and Operations Report 2016 Update", dated November 2016 and prepared by Archibald Engineering, which includes the application to amend Environmental Compliance Approval A321604.
- (12) Letter from Azimuth Environmental Consulting, Inc. to K. Snoddy, City of Kawartha Lakes, dated July 25, 2019 Re: Reasonable Use Policy (RUP) Study and Response to Conditions 40 and 41 of ECA for the Somerville Landfill Site (A321604) - REVISED.

- (13) Application for Environmental Compliance Approval dated June 14, 2021 and supporting technical documents including email dated December 7, 2021 from David Kerr, Manager of Environmental Services, City of Kawartha Lakes to Abdul Quyum, MECP.
- (14) Application for Environmental Compliance Approval dated December 15, 2021 and supporting technical documents including email dated February 23, 2022 from David Kerr, Manager of Environmental Services, City of Kawartha Lakes to Abdul Quyum, MECP.

SCHEDULE "B"

This Schedule "B" forms part of Approval No. A321604.

Monitoring Station	Frequency	Parameters
<u>Ground Water</u> MW 1-I , MW 1-II , MW2-II , MW5-I , MW7 , MW8-I, MW8-III, MW9, MW 10-II , MW 11, MW 12, MW13 , MW 14, MW15, MW 16-I , MW16 -II , MW 16-III , MW17 New Well Nests ** northeast, southeast south, west	Semi-Annual April/May & September/October	Biochemical Oxygen Demand (BOD), Volatile Organic Compounds (VOCs*), Dissolved Organic Carbon (DOC), alkalinity, ammonia, chloride, hardness, nitrate, sulfate, Total Kjeldahl Nitrogen (TKN), barium, boron, calcium, iron, magnesium, sodium, potassium , manganese, pH, conductivity, Total Dissolved Solids (TDS), Total Suspended Solids (TSS) (leachate only), Chemical Oxygen Demand (COD) *VOC's - annual during Fall event Water Level Measurements ** - 4 new well nests to be installed in time for sampling in September/October 2019.
<u>Landfill Gas</u> MW 1-I , MW 1-II , MW2-II , MW5-I , MW7 , MW8-I, MW8-III, MW9, MW 10-II , MW 11, MW 12, MW13 , MW 1 4, MW15, MW 16-I , MW16-II , MW 16-III , MW17 *MW-5-II, MW5-III, MW8-II and MW10-I Gas Probes GP1 and GP2	Semi-Annual April/May & September/October	Combustible Gas Measurements *Gas monitoring in MW-5-II, MW5-III, MW8-II and MW10-I may be discontinued after 2 years if gas is not detected.
<u>Surface Water</u> SWA, SWB & SWD	Semi-Annual April/May & September/October	BOD, phenols, Free cyanide, Total Organic Carbon (TOC), Dissolved Organic Carbon (DOC), TKN nitrate, nitrite, ammonia (un-ionized), ammonia (total), alkalinity, hardness, chloride, phosphorous, sulphate, aluminum, arsenic, barium, boron, cadmium, calcium, chromium, copper, iron, lead, magnesium, mercury, nickel, potassium, selenium, silver, sodium, zinc, pH , conductivity, TSS, COD, colour, turbidity

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

- 1. The reason for inclusion of the definitions is to define the specific meaning of terms and simplify the wording of conditions in this Approval.*
- 2. The reason for Condition 1 is to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.*
- 3. The reason for Conditions 2, 3, 4, 5, 6, 7, 8, 9, 10, 14 and 15 is to clarify the legal rights and responsibilities of the Owner under this Approval.*
- 4. The reason for Condition 12 is to restrict potential transfer or encumbrance of the Site without the approval of the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Approval.*
- 5. The reasons for Conditions 11 is to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.*
- 6. The reason for Condition 13 is to ensure that appropriate Ministry staff have ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this Approval. These conditions are supplementary to the powers of entry afforded a Provincial Officer pursuant to the EPA and OWRA.*
- 7. The reason for Conditions 16 and 17 are to ensure that members of the public and users of the Site are aware of important information related to the proper operation of the site, such as operating hours and directions on how to access services offered at the Site.*
- 8. The reasons for Condition 19 is to specify site access to/from the Site and to ensure the controlled access and integrity of the Site by preventing unauthorized access to the Site.*
- 9. The reason for Conditions 25, 26, 27 and 32 is to ensure that the Site only receives the types and quantities of waste for which it is approved.*
- 10. The reason for Condition 31 is to ensure that the Director is satisfied that the Site is in compliance with all applicable regulatory requirements before landfilling proceeds to subsequent phases.*
- 11. The reason for Conditions 18, 20, 21, 22, 23, 24, 28, 29, 30, 32, 33, 34, 35, 36, 37, 40, 41 and 42 are to ensure the site is maintained in a manner in which as adverse effect does not occur. This is to ensure the long-term protection of the environment and human health.*
- 12. The reason for Condition 38 is to demonstrate that the landfill site is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any*

necessary remedial/contingency action can be taken.

13. *The reason for Condition 37 is to ensure that dangerous levels of landfill gas are detected prior to people entering the equipment shed. This is necessary to protect the health and safety of people.*
14. *The reason for Conditions 43 and 44 is to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.*
15. *The reason for Condition 45 is to ensure that the Site is closed in accordance with Ministry standards and to protect the health and safety of the public and the environment.*

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A321604 issued on December 9, 2021

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

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

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

The Notice should also include:

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

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

This Notice must be served upon:

Registrar*
Ontario Land Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
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.oltb.gov.on.ca

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

DATED AT TORONTO this 24th day of February, 2022



Mohsen Keyvani, P.Eng.

Director

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

AQ/

c: District Manager, MECP Peterborough
David Kerr, City of Kawartha Lakes

**Ministry of the
Environment,
Conservation and Parks**
Eastern Region
1259 Gardiners Road, Unit 3
Kingston ON K7P 3J6
Phone: 613.549.4000
or 1.800.267.0974

**Ministère de l'Environnement,
de la Protection de la nature
et des Parcs**
Région de l'Est
1259, rue Gardiners, unité 3
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MEMORANDUM

July 23, 2025

TO: Glenn Rutherford
Environmental Compliance Officer
Peterborough District Office
Eastern Region

FROM: Thomas Guo
Hydrogeologist
Technical Support Section
Eastern Region

RE: 2024 Annual Monitoring Report
Somerville Waste Disposal Site
381 Ledge Hill Road
Lot 13, Concession 3, Geographic Township of Somerville
City of Kawartha Lakes

Environmental Compliance Approval (ECA): A321604

I have reviewed the report "Somerville Landfill Site, 2024 annual Monitoring Report, 381 Ledge Hill Road, City of Kawartha Lakes", prepared by Azimuth Environmental Consulting Inc. (AEC) and dated May 2025 with AEC Project No. 24-010.

I offer the following comments for your consideration from groundwater perspective.

Summary

- The Somerville Landfill site is an operating site. Reasonable Use Guideline B-7 (RUG) applies to operating waste disposal sites; thus RUG applies to the this site. The ECA requires the site to meet the RUG;
- Several parameters were detected to exceed the RUG limits in the monitoring wells along the northern and western property boundaries. AEC interpreted these exceedances are likely not related to natural occurrence. Continuing monitoring is required to check this interpretation;
- Monitoring wells MW203 and MW204 should be decommissioned as per Regulation 903 given that either or both of chloride and sulphate in these monitoring wells exceed (s) the mineralized water level (500 mg/L) specified in Regulation 903 (as amended); and
- The proposed groundwater monitoring program is acceptable.

Environmental Compliance Approval (ECA)

The Somerville waste disposal site (WDS) is located on the northwest corner of Lot 13, Concession 3, Geographic Township of Somerville. The site is located in, and owned

and operated by, the City of Kawartha Lakes (CKL). The site is licensed under ECA No. A321604. The site is licensed for the use of a 13 hectare landfill area and a 50 metre by 90 metre composting area, within a total site area of 61.6 hectares. The site is licensed to receive non-hazardous solid waste generated within CKL. The site began operating in 1972. The site is a natural attenuation site and the landfilling method is area fill.

Site Settings

The Somerville WDS is located approximately 11 kilometres northeast of Fenelon Falls on the west side of Ledgehill Road.

The site is located on top of a northeast-southwest oriented drumlin. The topography of the site slopes radially from the crest of the drumlin, while regional topography generally slopes in a northerly direction.

Surrounding lands are generally hummocky in nature with minor swamps and wetland features present throughout the surrounding area. Surrounding land uses are rural in nature and generally consist of undeveloped forest and pasture land. An automotive scrap yard is reported to be located on private land to the north of the site. A large ponded area is located in the northwestern area of the site and extends offsite. The large ponded area drains in a northerly direction and ultimately discharges to the Burnt River, located approximately 1.5 kilometres northwest of the site.

Geology

The drumlin is composed of sandy silt and silty sand till. Overburden thickness on and surrounding the site is highly variable, with overburden thickness reported to range from 0 metres (i.e. bedrock outcrop) to as much as 20 metres atop the drumlin. The overburden materials are underlain by limestone bedrock of the Bobcaygeon Formation.

Hydrogeology

The overburden and bedrock represent two (2) distinctive hydrogeological units. AEC indicates that a perched groundwater condition is present within the drumlin and within the waste mound.

A groundwater divide has been reported to run along the axis of the drumlin, with groundwater flow occurring primarily toward the northwest or southeast. Radial flow conditions are observed to the east of the active fill area. AEC indicates that all the current waste areas (Areas 1, 2, and 3) are located on the northwest side of the groundwater divide, while the new waste cell at the south end of Area 2 may straddle the divide such that there is some potential flow from this waste area to the south / southeast. It is reported that groundwater within the drumlin/overburden is expected to, discharge to surface near the toe of the esker and move toward the wetland/ponded area located on the northwest portion of the site, or migrate downward into the bedrock.

AEC indicates that the groundwater table in the bedrock unit is relatively flat with regional groundwater flow occurring to the west, toward the Burnt River.

Groundwater Monitoring

The current groundwater monitoring network consists of 23 monitoring wells, including 6 wells in the shallow overburden, 4 wells in the deep overburden, 12 wells in the bedrock, and 1 leachate monitor.

The 2024 monitoring program was conducted in April and October 2024.

The 2024 program was completed as required with the exception of ground water sample collection from MW1-II (spring & fall), MW5-I (spring & fall), MW7 (fall), MW8-I (fall), MW8-III (fall), MW11 (fall), MW12 (fall), MW16-I (fall), MW16-II (fall) & MW201 (spring & fall). All of these locations were dry or insufficient water for sample collection, while MW9 was not sampled in 2024 as it was inaccessible due to flooding in spring and destroyed in the fall.

Background Water Quality

Background groundwater quality in the overburden unit is assessed based on groundwater quality at monitoring well MW13, located approximately 250 metres south of the approved fill areas. Background groundwater quality in the bedrock unit is currently assessed based on groundwater quality at monitoring well MW5-1. Two additional upgradient bedrock monitoring wells (MW201D & MW202) were installed in October 2019 and are included in the interpretation. MW201 was also installed in 2019 but a sample has yet to be taken due to dry or insufficient water conditions.

The water quality can be characterized by a low to moderate level of mineralization in both the overburden and bedrock. ODWQS (Ontario Drinking Water Quality Standards) are consistently exceeded for hardness within both the bedrock and overburden. Dissolved organic carbon (DOC) is noted to exceed on occasion in both of the units, albeit mostly in the overburden horizon. The wetland environment present around the Site could account for the enhanced DOC concentrations being vegetation decay (i.e., lignins and tannins). Water quality for MW202 is consistent with the description provided above for the other background monitors. MW201D has shown exceedances for iron, DOC and manganese in 2024 similar to previous years.

Leachate

Presently, the best available estimate of leachate quality at the Site is the analytical data obtained from MW17, which is screened within the waste of the active area (Area 2). Given this well is within the active waste area, it provides the best representation of current leachate conditions at the Site, although it is noted that MW1-II is immediately downgradient of the historical waste cell for the Site (Area 1), such that this also provides a reference for the more historic and mature leachate signature at the Site.

One of the most significant deviations noted between the leachate and natural levels is with respect to nitrogen species (i.e., TKN and total ammonia [as N]), although other notable elevations include boron, chloride, alkalinity, hardness, TDS, as well as a number of other parameters. Elevated concentration of both ammonia and TKN at MW17 is indicative of a geochemically reducing environment, as is typical of ground water conditions in the immediate vicinity of any landfill site.

The historic leachate signature for Area 1 as evidenced by the water quality at MW1-I/II, shows a more depleted / mature signature that is absent of the significant ammonia / TKN elevations observed at MW17 as expected since this portion of the landfill is older. Elevated concentrations remain for the majority of leachate indicator parameters; however, their concentrations have shown to be stable for the period of record.

AEC has identified the following leachate indicator parameters (LIPs) associated with the

site: alkalinity, chemical oxygen demand (COD), chloride, calcium, DOC, iron, barium, boron, ammonia, TKN, hardness, manganese, potassium, sodium and total dissolved solids (TDS). They are appropriate LIPs.

Downgradient Water Quality

Leachate impacts are occurring from overburden monitoring wells MW1-I, MW1-II to a lesser extent MW11.

Leachate impacts are evident in bedrock monitoring wells MW8-1, MW8-III, MW14 and MW201D.

Leachate impacts are identified in the vicinity of the historical and current landfilling areas in the overburden and bedrock aquifers.

Previous MECP's hydrogeologist concluded that leachate impacts have not been delineated to the north and northeast of monitoring wells MW11/MW14 and are likely extending off-site in this direction. Monitoring well MW204, which is located 100 m past MW11 and MW14, has shown to be represented by naturally mineralized water quality with an absence of more prominent leachate indicator parameter such as DOC, iron and manganese which have been shown to be elevated at MW14 owing to leachate influence. This would indicate that the bedrock fracture plane targeted at MW14 is not laterally extensive such that migration of leachate impacts within the bedrock to the northeast is likely limited to within the road alignment.

Organic Sampling Results

As part of the monitoring program in 2024, volatile organic compounds (VOC) samples were to be collected from all monitoring wells during the fall monitoring events. As such, in 2024 samples were collected from MW1-I, MW2-II, MW10-II, MW13, MW14, MW15, MW16-III & MW17, MD201D, MW202, MW203 & MW204. As with previous years, detections were primarily observed at MW17, while a single parameter was detected at MW2-II, which also has shown detections historically. As such, there is a weak organic presence within the landfill which is not unexpected.

Groundwater/Surface Water Interaction

Given the presence of a ground water mound within the drumlin, and the relatively steep slope on the northwest side of the Site, there is the potential for leachate affected ground water to discharge via surface seeps to the ponded area in the northwest.

AEC concluded that surface water chemistry in the ponded area is consistent with that measured at the background location, suggesting that landfill operations are having a negligible effect on surface water quality.

Guideline B-7

Reasonable Use Guideline B-7 (RUG) applies to operating waste disposal sites. AEC determined that the downgradient property boundaries, MW10-II, MW11, MW204 and MW16-I/II/III were used for compliance to the north and east, MW15 was used for compliance with the north and MW12 and MW203 were used for compliance to the west. It is noted that with MW204 now constructed, it replaces MW14 as the compliance well for the northeast corner of the Site.

The following RUG limits exceedances were detected:

- MW11 (overburden at the northeast): DOC;
- MW16-I (bedrock at the east): DOC;
- MW16-II (bedrock at the east): DOC;
- MW203 (bedrock at the west): boron, chloride, hardness, fluoride, iron, nitrite, sodium, sulphate, and TDS;
- MW204 (bedrock at the northeast): boron, chloride, hardness, aluminium, sodium, sulphate, and TDS.

AEC states that:

- The majority of these parameters are not directly related to the landfill and most likely represent variation of naturally occurring earth elements as they are found to be significantly elevated in the background locations;
- The most significant and numerous exceedances were found at MW203 and MW204; however, these locations have been determined to be sourced to naturally mineralized water quality;
- Although MW11, which is the most north-easterly monitoring location in the overburden has shown RUG limit exceedances, a new overburden compliance location could not be installed further northeast in the same location as MW204 due to limited thickness (3 m) and unsaturated overburden conditions.

Continuing the monitoring program is required to check AEC's these statements. I have noticed that either or both of chloride and sulphate in monitoring well MW203 and MW204 exceed (s) the mineralized water level (500 mg/L) specified in Regulation 903 (as amended). These two monitoring wells should be decommissioned as per Regulation 903.

Groundwater Monitoring Program

The monitoring program recommended for 2025 is identified in Table 11 and is based on the current data set and Site understanding. The program is similar to 2024 with the exception of the reduction in VOC sampling locations and the removal of gas monitoring.

This program is acceptable from groundwater perspective.



Thomas Guo, M. Eng., P. Geo.
TG/

cc: Victor Castro, Water Resource Unit Supervisor
Christina Klein, Technical Support Manager

c: Dana Cruikshank, Surface Water Specialist
File No. GW KL KL 01 02 C3 (Somerville WDS; ECA No. A321604)
TG/ECHO # 1-1482681832



APPENDIX B

Borehole Logs

**TABLE 1
MONITOR WELL DETAILS**

BOREHOLE		MONITOR DETAILS						INSTALLATION DETAILS		
No.	Diameter	Diameter	Material	Elevations		Screened Interval		Depth Below Ground (m)	Elevation (m)	Material
	(mm)	(mm)		Ground (m)	Top of pipe (m)	Elevation (m)	Hydrostatic Unit			
1-I	150	50	PVC	295.49	296.43	283.0 to 284.5	Overburden/ Bedrock	0.0 to 0.1 0.1 to 9.5 9.5 to 9.9 9.9 to 12.5	295.5 to 295.4 295.4 to 286.0 286.0 to 285.6 285.6 to 283.0	berlonite native backfill berlonite sand
1-II	150	50	PVC	295.49	296.34	286.4 to 289.4	Overburden	0.0 to 0.4 0.4 to 5.7 5.7 to 6.1 6.1 to 9.1	295.5 to 295.1 295.1 to 289.8 289.8 to 289.4 289.4 to 286.4	berlonite native backfill berlonite sand
2-I	150	50	PVC	296.18	296.66	280.2 to 281.7	Overburden/ Bedrock	0.0 to 0.3 0.3 to 6.2 6.2 to 6.5 6.5 to 12.1 12.1 to 12.4 12.4 to 13.6 13.6 to 14.2 14.2 to 16.0	296.2 to 295.9 295.9 to 290.0 290.0 to 289.7 289.7 to 284.1 284.1 to 283.8 283.8 to 282.6 282.6 to 282.0 282.0 to 280.2	berlonite native backfill berlonite native backfill berlonite native backfill berlonite sand
2-II	150	50	PVC	296.40	297.27	284.2 to 287.3	Overburden	0.0 to 8.2 8.2 to 8.5 8.5 to 12.2	296.4 to 288.2 288.2 to 287.9 287.9 to 284.2	native backfill berlonite sand
3	150	50	PVC	300.23	301.19	282.6 to 285.6	Overburden	0.0 to 13.3 13.3 to 13.8 13.8 to 17.7	300.2 to 287.0 286.9 to 286.5 286.5 to 282.6	native backfill berlonite sand
4	150	50	PVC	284.51	285.46	282.4 to 283.9	Overburden/ Bedrock	0.0 to 0.3 0.3 to 2.1	284.5 to 284.2 284.2 to 282.4	berlonite sand
5-III	150	50	PVC	293.64	294.52	281.6 to 283.1	Overburden/ Bedrock	0.0 to 9.6 9.6 to 10.1 10.1 to 12.0	293.6 to 284.0 284.0 to 283.6 283.6 to 281.6	native backfill berlonite sand
6	150	50	PVC	279.27	279.89	276.8 to 278.3	Overburden/ Bedrock	0.0 to 0.3 0.3 to 0.6 0.6 to 2.4	279.3 to 279.0 279.0 to 278.7 278.7 to 276.8	native backfill berlonite sand
7	150	50	PVC	280.88	281.86	276.6 to 278.1	Refuse	0.0 to 1.5 1.5 to 2.1 2.1 to 4.2	280.9 to 279.4 279.4 to 278.8 278.8 to 276.6	native backfill berlonite sand

BOREHOLE NUMBER

1

FIGURE F-1

page 1 of 2

Project	Somerville Landfill	Drill Type	CME	Ground Elevation	295.49
Location	lot 13, con 3, Somerville	Technician	D. Hamilton	Static Water Elevation	-
Date	September 9, 1992	Contractor	Eastern	Elevation Datum	assumed

DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS
	Description	Symbol		#	type	N'	
0	TOPSOIL						
	REFUSE & FILL (cover)			1	AS	-	
1							
2				2	SS	6	
3				3	SS	6	
4							
5				4	SS	6	
6	Till Fine sandy silt to silty fine sand till trace gravel trace to some clay occasional sand seams grey			5	SS	37	
7	dense to very dense						
8	- soils becoming saturated			6	SS	99	grain size analysis
9	- sand seams		1-II	7	SS	93	

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BOREHOLE NUMBER

1

FIGURE F-1

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Project	Somerville Landfill	Drill Type	CME	Ground Elevation	295.49
Location	lot 13, con 3, Somerville	Technician	D. Hamilton	Static Water Elevation	-
Date	September 9, 1992	Contractor	Eastern	Elevation Datum	assumed

DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS
	Description	Symbol		#	type	N°	
10							
11				8	SS	73	
12				9	SS	100 for 200 mm	
	ASSUMED BEDROCK		1-4				
13							
14							
15							
16							
17							
18							
19							

See Table 1
for
installation
details

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COUNTY OF VICTORIA

TRANSPORTATION AND PUBLIC WORKS DEPARTMENT

BOREHOLE NUMBER

2

FIGURE F-2

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Project	Somerville Landfill	Drill Type	CME	Ground Elevation	296.18
Location	lot 13, con 3, Somerville	Technician	D. Hamilton	Static Water Elevation	-
Date	September 8-9, 1992	Contractor	Eastern	Elevation Datum	assumed

DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS
	Description	Symbol		#	type	N'	
0	TOPSOIL						
	Till						
	Fine sandy silt to silty fine sand till trace gravel, clay occasional sand seams grey to blue-grey compact to very dense			1	SS	5	
1							
2				2	SS	25	
3							
	- sand seam			3	SS	54	
4							
5				4	SS	41	grain size analysis
6							
	- sand seam			5	SS	37	
7							
8				6	SS	108	
9							
				7	SS	88	

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BOREHOLE NUMBER

2

FIGURE F-1

page 2 of 2

Project	Somerville Landfill	Drill Type	CME	Ground Elevation	296.18
Location	lot 13, con 3, Somerville	Technician	D. Hamilton	Static Water Elevation	-
Date	September 8-9, 1992	Contractor	Eastern	Elevation Datum	assumed

DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS
	Description	Symbol		#	type	N'	
10							
11	- sandy silt seam, saturated			8	SS	80	grain size analysis
12			2-II				
13	-cobbles/boulders to bedrock			9	SS	89	
14				10	SS		90 for 100 mm refusal
15				11	SS	94	refusal
16	ASSUMED BEDROCK		2-I				
17							
18							
19							

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for
installation
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BOREHOLE NUMBER

3

FIGURE F-3

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Project	Somerville Landfill	Drill Type	CME	Ground Elevation	300.23
Location	lot 13, con 3, Somerville	Technician	D. Hamilton	Static Water Elevation	-
Date	September 10, 1992	Contractor	Eastern	Elevation Datum	assumed

DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS
	Description	Symbol		#	type	N'	
0	TOPSOIL						
	Till			1	SS	5	
	Fine sandy silt to silty fine sand till trace gravel						
1	trace to some clay occasional sand seams grey to blue-grey compact to very dense						
				2	SS	19	grain size analysis
2							
3	- cobbles			3	SS	34	
4							
				4	SS	-	
5							
6				5	SS	107	mantled, slight cementations
7							
				6	SS	95	
8							
9				7	SS	76	

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TRANSPORTATION AND PUBLIC WORKS DEPARTMENT

BOREHOLE NUMBER

3

FIGURE F-3

page 2 of 2

Project	Somerville Landfill	Drill Type	CME	Ground Elevation	300.23
Location	lot 13, con 3, Somerville	Technician	D. Hamilton	Static Water Elevation	-
Date	September 10, 1992	Contractor	Eastern	Elevation Datum	assumed

DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS
	Description	Symbol		#	type	N'	
10							
11				8	SS	108	
12				9	SS	120	
13				10	SS	104	wet at tip of sample
14							
15	- sand seam, saturated			11	SS	96	
16							
17				12	SS	62 for 15 cm	
18				13	SS	73 for 15 cm	
19							
20	ASSUMED BEDROCK			14	SS	refusal	

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4

FIGURE F-4

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Project		Somerville Landfill	Drill Type		CME	Ground Elevation		284.51
Location		lot 13, con 3, Somerville	Technician		D. Hamilton	Static Water Elevation		-
Date		September 11, 1992	Contractor		Eastern	Elevation Datum		assumed
DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS	
	Description	Symbol		#	type	N'		
0	Till							
1	Cobbly fine sandy silt to silty fine sand till trace gravel occasional sand seams grey to blue-grey dense to very dense							
2				1	SS	36		
	ASSUMED BEDROCK		4					
3								
4								
5								
6								
7								
8								
9								
			See Table 1 for Installation details					

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TRANSPORTATION AND PUBLIC WORKS DEPARTMENT

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5

FIGURE F-5

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Project	Somerville Landfill	Drill Type	CME	Ground Elevation	293.64
Location	lot 13, con 3, Somerville	Technician	D. Hamilton	Static Water Elevation	-
Date	September 14, 1992	Contractor	Eastern	Elevation Datum	assumed

DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS
	Description	Symbol		#	type	N'	
0	TOPSOIL						
	SAND						
	Silty fine sandy			1	SS	6	
	trace gravel						
1	brown						
	loose to compact						
2				2	SS	9	
3	- cobble (?)			3	SS	26	
4	Till						
	Fine sandy silt						
	to silty fine sand till						
	trace gravel			4	SS	34	
5	trace to some clay						
	occasional sand seams						
	light grey to grey						
	compact to very dense						
6				5	SS	50	
7							
				6	SS	100 for 150 mm	
8							
9				7	SS	125 for 100 mm	grain size analysis

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BOREHOLE NUMBER

5

FIGURE F-5

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Project	Somerville Landfill	Drill Type	CME	Ground Elevation	293.64
Location	lot 13, con 3, Somerville	Technician	D. Hamilton	Static Water Elevation	-
Date	September 14, 1992	Contractor	Eastern	Elevation Datum	assumed

DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS
	Description	Symbol		#	type	N'	
10							
11				8	SS	130	
12				9	SS	75 for 25 mm	
	ASSUMED BEDROCK						
13							
14							
15							
16							
17							
18							
19							
20			See Table 1 for Installation details				

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BOREHOLE NUMBER

6

FIGURE F-6

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Project	Somerville Landfill	Drill Type	CME	Ground Elevation	279.27
Location	lot 13, con 3, Somerville	Technician	D. Hamilton	Static Water Elevation	-
Date	September 11, 1992	Contractor	Eastern	Elevation Datum	assumed

DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS
	Description	Symbol		#	type	N°	
0	HUMUS, organic			1	SS	4	
	Till						
1	Cobbly fine sandy silt to silty fine sand till trace gravel grey to blue-grey dense to very dense						
2				2	SS	68	
	ASSUMED BEDROCK		6				
3							
4							
5							
6							
7							
8							
9							
			See Table 1 for installation details				

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BOREHOLE NUMBER

7

FIGURE F-7

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Project	Somerville Landfill	Drill Type	CME	Ground Elevation	280.88
Location	lot 13, con 3, Somerville	Technician	D. Hamilton	Static Water Elevation	-
Date	September 11, 1992	Contractor	Eastern	Elevation Datum	assumed

DEPTH (m)	INFERRED STRATIGRAPHY		MONITOR	SAMPLE			REMARKS
	Description	Symbol		#	type	N'	
0	REFUSE & FILL (cover)			1	SS	7	
1							
2				2	SS	10	
3	Till Silty sand till some gravel trace clay brown loose			3	SS	7	
4	ASSUMED BEDROCK						
5							
6							
7							
8							
9							

See Table 1
for
Installation
details

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COUNTY OF VICTORIA

TRANSPORTATION AND PUBLIC WORKS DEPARTMENT

PROJECT: 981-1626

LOCATION: SEE BOREHOLE LOCATION PLAN

INCLINATION: -90 AZIMUTH: N/A

RECORD OF DRILLHOLE: BH 5a

DRILLING DATE: FEB.20&21/97

DRILL RIG: NODWELL CME 75

DRILLING CONTRACTOR: ALL TERRAIN LTD.

SHEET 1 OF 2

DATUM: GEODETTIC



L142905A.BNR

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (mm/min)	FLUSH % RETURN	FR-FRACTURE		F-FAULT		SM-SMOOTH		FL-FLEXURED		BC-BROKEN CORE		HYDRAULIC CONDUCTIVITY K, cm/sec	DIAMETER CORRECTION INDEX (mm)	NOTES WATER LEVELS INSTRUMENTATION
								CL-CLEAVAGE	J-JOINT	P-POLISHED	B-BUCKLE SIDED	R-ROUGH	ST-STEPPED	W-WAVY	C-CURVED	MECH. BREAK	B-BEDDING			
0		GROUND SURFACE		293.84																
1		OVERBURDEN Soil description based on auger cuttings.		0.00																CEMENT
2		Brownish grey, fine to coarse silty SAND, some gravel, some clay, few cobbles, dry to moist (TILL)																		BENTONITE SEAL
3																				
4																				
5																				
6	105mm I.D. HOLLOW STEM AUGERS	Gray COBBLES and BOULDERS, some sand, some gravel, wet		287.85 5.79																CAVED MATERIAL
7				288.83 7.01																
8		Gray sandy SILT to silty SAND, some to little gravel, some to little cobbles, dry. (TILL)																		BENTONITE SEAL
9																				
10		CONTINUED ON NEXT PAGE																		

DATA INPUT: PS 8/PT.16/97

RLCKMVS

DEPTH SCALE:

1 to 50

Golder Associates

LOGGED: DH

DATE:

CHECKED: DH

PROJECT: 961-1026

LOCATION: SEE BOREHOLE LOCATION PLAN

INCLINATION: -90

AZIMUTH: N/A

RECORD OF DRILLHOLE: BH 5a

DRILLING DATE: FEB.20&21/97

DRILL RIG: NODWELL GME 75

DRILLING CONTRACTOR: ALL TERRAIN LTD.

SHEET 2 OF 2

DATUM: GEODETIC



L102005A BHR

DEPTH SC. METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (mm/min)	FLUSH % RETURN	COLOUR (mm)	FR-FRACTURE	F-FAULT	SM-SMOOTH	FL-FLEXURED	BC-BROKEN CORE	DIAMETRAL INDEX (mm)	NOTES WATER LEVELS INSTRUMENTATION
									CL-CLEAVAGE	J-JOINT	R-ROUGH	UE-UNEVEN	MB-MECH. BREAK		
									SH-SHEAR	P-POLISHED	ST-BEPPED	W-WAVY	B-BEDDING		
									VN-VEIN	S-SUCKEN SIDED	PL-PLANAR	C-CURVED			
									RECOVERY		R.Q.D. %	FRACT. INDEX	DISCONTINUITY DATA		HYDRAULIC CONDUCTIVITY K, cm/sec
									TOTAL CORE %	SOLID CORE %			TYPE AND SURFACE DESCRIPTION		
10		CONTINUED FROM PREVIOUS PAGE													
11	106mm I.D. HOLLOW STEM AUGERS	Gray sandy SILT to silty SAND, some to little gravel, some to little cobbles, dry. (TILL)													
12															
13															
14															
15															
16															
17															
18															
19	102mm C.D. HQ CORING	Fresh to slightly weathered, brownish gray to grey, very thinly to medium bedded, very fine to medium grained, non porous to slightly porous, stippled LIMESTONE and argillaceous to nodular textured LIMESTONE. Slightly weathered zone at 14.78m and at 15.85m to 16.31m, water found at approx. 16m bgs during drilling. (BOBCAYGEON FORMATION)													
20															
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															

DEPTH SCALE:

1 to 50

Golder Associates

LOGGED: DH

DATE:

CHECKED: DH

Borehole depth: 27.18m

PROJECT: 901-1628

RECORD OF BOREHOLE BH-8-II

SHEET 1 OF 3

LOCATION: REFER TO PLAN

BORING DATE: SEPT. 11-12/96

DATUM: GEODETIC

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm



11025604 BH-5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, K, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLAT ELEV. DEPTH (m)	NUMBER	TYPE	SHEAR STRENGTH Cu, kPa	rem V - @ U - O	WATER CONTENT, PERCENT Wp W Wn			
0	NODWELL MOUNTED CME-75 100mm I.D. HOLLOW STEM AUGERS	GROUND SURFACE	291.83								CONCRETE & CASING
		Compact, dark brown, moist, silty TOPSOIL, some sand, rootlets.	0.00								
			0.13								
		Compact, brown, moist silty SAND.	0.25	1	88	17					
1											
2				2	88	46					
3											
4				4	88	87/28					
5		Compact to very dense, grey, moist SAND and SILT, some gravel, trace clay, occ. cobbles, occ. very thin sand partings. (TILL)		5	88	88/25					
6				6	88	50/10					
7			7	88	50/05						
8											
9											
10											

CONTINUED ON NEXT PAGE

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: TOM

CHECKED: PMM

DATA INPUT: DE SEPT 1997

SHEET 1

PROJECT: 981-1628

RECORD OF BOREHOLE BH-8 -II

SHEET 2 OF 3

LOCATION: REFER TO PLAN

BORING DATE: SEPT.11-12/95

DATUM: GEODETIC

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm



L1123008 BHS

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, K, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, KPa nat V - + Q - ● tam V - ⊗ U - □	WATER CONTENT, PERCENT Wp ——— W ——— W 5 10 15 20			
10		CONTINUED FROM PREVIOUS PAGE									
		BEDROCK INFERRED	281.47								
		CONTINUED ON DRILLHOLE	10.39								
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
		CONTINUED ON NEXT PAGE									

L1123008 BHS

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: YDM

CHECKED: PMM

PROJECT: 981-1828

RECORD OF DRILLHOLE: BH-8 -1

SHEET 3 OF 3

LOCATION: REFER TO PLAN

DRILLING DATE: SEPT. 11-12/96

DATUM: GEODETIC

INCLINATION: AZIMUTH:

DRILL RIG: GME-75

DRILLING CONTRACTOR: ALL-TERRAIN DRILLING LTD.



L1828008 BH-8

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (mm/min)	FLUSH % RETURN	FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN			F-FAULT J-JOINT P-POLISHED S-SUCKENSIDED			SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR			FL-FLEXURED UE-UNEVEN W-WAVY C-CURVED			BC-BROKEN CORE MB-MECH. BREAK B-BEDDING			HYDRAULIC CONDUCTIVITY X. cm/sec	POTENTIAL INDEX (mV)	NOTES WATER LEVELS INSTRUMENTATION		
								RECOVERY		R.O.D. %	FRACT. INDEX FOR Q25	DISCONTINUITY DATA	TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA	DISCONTINUITY DATA												
								TOTAL CORE %	SOLID CORE %																		
10	CONTINUED FROM PREVIOUS PAGE CONTINUED FROM BOREHOLE BH-8			281.47 10.38																							
11		Fresh to slightly weathered, brownish grey to grey, thin to medium bedded, fine to medium grained, stylolitic LIMESTONE and argillaceous to nodular textured LIMESTONE.			1	0.081	80																			BENTONITE SEAL	
12				2	0.12	80																					
13				3	0.08	80																					
14		END OF DRILLHOLE		277.73 14.10																							
15																											
16																											
17																											
18																											
19																											
20																											

DATA INPUT: PS SEPT. 1997

ROCKING

DEPTH SCALE:

1 to 50

Golder Associates

LOGGED: TOM

DATE:

CHECKED: PMM

Water level in BH
8-1 at elevation
278.18m on
July 5, 1997.

PROJECT: 981-1628

RECORD OF BOREHOLE BH-9

SHEET 1 OF 2

LOCATION: REFER TO PLAN

BORING DATE: SEPT.12/96

DATUM: GEODETIC

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOW/0.3m		HYDRAULIC CONDUCTIVITY, K, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER	TYPE	SHEAR STRENGTH Cu, kPa	net V - + rem V - @ U - O	WATER CONTENT, PERCENT Wp	W		
0		GROUND SURFACE	279.28	1	SO						
		Loose, dark brown, moist silty TOPSOIL, trace to some clay, roots.	0.00								
			278.00								
		BEDROCK INFERRED	0.28								
		CONTINUED ON DRILLHOLE	0.38								
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

CONTINUED ON NEXT PAGE

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: TDM

CHECKED: PMM

PUT: 16 SEPT 1997

SHEET 1

PROJECT: 961-1026

RECORD OF DRILLHOLE: BH-9

SHEET 2 OF 2

LOCATION: REFER TO PLAN

DRILLING DATE: SEPT.12/96

DATUM: GEODETIC

INCLINATION: AZIMUTH:

DRILL RIG: CME-75

DRILLING CONTRACTOR: ALL-TERRAIN DRILLING LTD.



L14225000 BHR

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No. PENETRATION RATE (mm/min)	FLUSH % RETURN	RECOVERY		R.O.D. %	FRACT. INDEX MA 0-20 CY 0-10 V 0-10	DISCONTINUITY DATA		HYDRAULIC CONDUCTIVITY K, cm/sec	CHARTERED LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION
							TOTAL CORE %	SOLID CORE %			TYPE AND SURFACE DESCRIPTION				
							FR-FRACTURE CL-CLEAVAGE SH-SHEAR VN-VEIN	F-FAULT J-JOINT P-POLISHED S-SUCKERSIDED			SM-SMOOTH R-ROUGH ST-STEPPED PL-PLANAR	FL-FLEXURED UE-UNEVEN W-WAVY C-CURVED			
0		CONTINUED FROM PREVIOUS PAGE CONTINUED FROM BOREHOLE BH-9		278.90 0.38											CONCRETE & CASING
1		Fresh to slightly weathered, brownish grey to grey, thin to medium bedded, stylolitic LIMESTONE and argillaceous to nodular textured LIMESTONE. Broken slightly weathered core from bedrock surface to 3.79m, some iron staining.			1	0.21									CAVE
2				2	0.067									BENTONITE SEAL	
3				3	0.064										
4				4	0.077									SILICA SAND	
5				5	0.078										
4	SEPT.12/96			274.84 4.44											IRON STAINING IRON STAINING
5		END OF DRILLHOLE													Water level elevation at 278.88m on July 5, 1997.
6															
7															
8															
9															
10															

DEPTH SCALE:

1 to 50

Golder Associates

LOGGED: TOM

DATE: .

CHECKED: PMM

PROJECT: 981-1626

RECORD OF BOREHOLE BH-10-II

SHEET 1 OF 3

LOCATION: REFER TO PLAN

BORING DATE: SEPT.10/98

DATUM: GEODETTIC

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, K, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER	TYPE	SHEAR STRENGTH C _u , kPa		WATER CONTENT, PERCENT			
0	ROD WELL MOUNTED CHIEFS 105mm I.D. HOLLOW STEM AUGERS	GROUND SURFACE	299.58								
		Loose, dark brown, moist, silty TOPSOIL, some sand, rootlets,	0.00 299.35								
			0.23	1	50 DO						
		Dense, brown, moist sandy SILT.									
1			298.82								
			0.78	2	50 DO						
2				3	50 DO						
3				4	80 DO						
4				5	80 DO						
5				6	80 DO						
6		Dense to very dense, gray, moist SAND and SILT, some gravel, trace clay, occ. cobbles, occ. silt seams up to 1cm thick, occ. very thin sand partings. (TILL)									
7			7	80 DO							
8			8	80 DO							
9			9	80 DO							
10		Fine sand, some silt at 9.22m to 9.37m.. Clayey silt, some sand at 9.37m to 9.50m.									
CONTINUED ON NEXT PAGE											

Dense to very dense, gray, moist
SAND and SILT, some gravel,
trace clay, occ. cobbles, occ.
silt seams up to 1cm thick, occ.
very thin sand partings. (TILL)

Fine sand, some silt at 9.22m to
9.37m.
Clayey silt, some sand at 9.37m
to 9.50m.

CONTINUED ON NEXT PAGE

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: TDM

CHECKED: PMM

PROJECT: 961-1626

RECORD OF BOREHOLE BH-10-II

SHEET 2 OF 3

LOCATION: REFER TO PLAN

BORING DATE: SEPT.10/96

DATUM: GEODETIC

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm



11/26/01 G.BNS

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, K, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANOMETER INSTALLATION
		DESCRIPTION	STRATA PLAT ELEV. DEPTH (m)	NUMBER	TYPE	SHEAR STRENGTH Cu, kPa	WATER CONTENT, PERCENT Wp — W — W				
10	NODWELL MOUNTED CME-75 10mm ID. HOLLOW STEM AUGERS	CONTINUED FROM PREVIOUS PAGE									
11				10	60 DO	87/ .20					
12											
13				11	60 DO	81/ .23					
14				12	60 DO	56/ .05					
15		Silty fine sand, occ. very thin medium sand seams at 12.34m to 12.59m.									
16		Silt and fine sand, trace medium sand, trace clay at 13.84m to 13.92m.									
17		BEDROCK INFERRED	282.51 17.07	14	60 DO	54/ .04					
18		CONTINUED ON DRILLHOLE									
19											
20		CONTINUED ON NEXT PAGE									

GROUT

BENTONITE
SEALSILICA
SAND

10-II

BENTONITE
SEALWater level
elevation in
monitoring well
BH 10-II at
287.62m on
July 5, 1997.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: TOM

CHECKED: PMM

PROJECT: 961-1626

LOCATION: REFER TO PLAN

INCLINATION: AZIMUTH:

RECORD OF DRILLHOLE: BH-10-I

DRILLING DATE: SEPT.10/98

DRILL RIG: CME-75

DRILLING CONTRACTOR: ALL-TERRAIN DRILLING LTD.

SHEET 3 OF 3

DATUM: GEODETIC



L1626010.BHR

DEPTH SC METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (mm/hr)	COLLUR & RETURN FLUSH	FR-FRACTURE		F-FAULT		SH-SMOOTH		FL-FLEXURED		BC-BROKEN CORE		DIAMETRAL INDEX (mm)	NOTES WATER LEVELS INSTRUMENTATION		
								CL-CLEAVAGE	J-JOINT	R-ROUGH	UE-UNEVEN	MB-MECH. BREAK	HYDRAULIC CONDUCTIVITY K, cm/sec								
								SH-SHEAR	P-POUSHED	ST-STEPPED	W-WAVY	B-BEDDING									
15	CONTINUED FROM PREVIOUS PAGE																				
16																					
17	CONTINUED FROM BOREHOLE BH-10																				
18		Fresh to slightly weathered, brownish grey to grey, thin to medium bedded, fine to medium grained stylolitic LIMESTONE and argillaceous to nodular textured LIMESTONE, broken slightly weathered core from bedrock surface to 18.12m, brownish grey sand and silt till at 17.95m to 18.0m.	282.51 17.07	1	0.065	80															
19			2	0.075	80																
20			3	0.077	80																
21	END OF DRILLHOLE																				
22																					
23																					
24																					
25																					

BC 17.07m-17.62m
 BC 17.62m-18.12m
 IRON STAINED
 MB
 MB
 IRON STAINED

BENTONITE SEAL
 SILICA SAND

Monitoring Well
 Dry on
 July 8, 1997.

DEPTH SCALE:
 1 to 50

Golder Associates

LOGGED: TDM
 DATE:
 CHECKED: PMM

DATA INPUT: PS SEPT.15/97

R000455



Well Tag Number (Please fill in and print number below)

Well Record

Regulation 903 Ontario Water Resources Act

page 1 of 1

- For use in the Province of Ontario only. This document is a permanent legal document. Please retain for future reference.
- All Sections must be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Help Desk (Toll Free) at 1-888-390-9355.
- All metre measurements shall be reported to 1/10th of a metre.
- Please print clearly in blue or black ink only.

First Name <i>City of Kawartha Lakes</i>		Last Name <i>Lindsay</i>		Mailing Address (Street Number/Name, RR, Lot, Concession) <i>50 Wolfe St.</i>					
County/District/Municipality <i>City of Kawartha Lakes</i>		Township/City/Town/Village <i>Lindsay</i>		Province <i>Ontario</i>		Postal Code <i>K9V 2J2</i>		Telephone Number (include area code)	
Address of Well Location (County/District/Municipality) <i>Somerville Landfill Site</i>				Township <i>Somerville</i>		Lot <i>13</i>		Concession <i>3</i>	
RR#/Street Number/Name <i>381 Ledgehill Road</i>				City/Town/Village <i>Kawartha Lakes</i>		Site/Compartment/Block/Treat etc.			
GPS Reading <i>N41.3</i>		NAD <i>13</i>		Northing <i>6283412</i>		Easting <i>4946141</i>		Unit Make/Model <i>Maclean</i>	
Mode of Operation: ☐ Undertreated, ☒ Covered ☐ Differentiated, ☐ Specified									

General Colour	Most common material	Other Materials	General Description	Depth From	Meters To
			2" Monitoring Well pulled. Borehole overdrilled with 4 1/4 HSA to 10ft (3.04m). Backfilled with Bentonite to surface.		

Hole Diameter			Construction Record					Test of Well Yield							
Depth		Metros	Diameter		Inside diam centimetres	Material	Wall thickness centimetres	Depth		Metros	Pumping test method	Draw Down		Recovery	
From	To	Centimetres	From	To				Time min	Water Level Metres	Time min		Water Level Metres			
			Casing												
			☐ Steel ☐ Fibreglass								Pump Intake set at - (metres)	Static Level			
			☐ Plastic ☐ Concrete								Pumping rate - (litres/min)	1		1	
			☐ Galvanized								Duration of pumping _____ hrs + _____ min	2		2	
			☐ Steel ☐ Fibreglass								Final water level end of pumping _____ metres	3		3	
			☐ Plastic ☐ Concrete								Recommended pump type	4		4	
			☐ Galvanized								☐ Galvan ☐ Cast ☐ Steel	5		5	
			☐ Steel ☐ Fibreglass								Recommended pump depth _____ metres	10		10	
			☐ Plastic ☐ Concrete								Recommended pump rate _____ (litres/min)	16		16	
			☐ Galvanized								If flowing give rate - _____ (litres/min)	20		20	
											If pumping discontinued, give reason.	25		25	
												30		30	
												40		40	
												50		50	
												60		60	
			Screen												
			Outside diam		☐ Steel ☐ Fibreglass	Slot No.									
					☐ Plastic ☐ Concrete										
					☐ Galvanized										
			No Casing or Screen												
					☐ Open hole										
Water Record															
Water (ours) Metres		Kind of Water													
☐ m	☐ Fresh	☐ Sulphur													
☐ Gas	☐ Salty	☐ Minerals													
Other: _____															
☐ m	☐ Fresh	☐ Sulphur													
☐ Gas	☐ Salty	☐ Minerals													
Other: _____															
☐ m	☐ Fresh	☐ Sulphur													
☐ Gas	☐ Salty	☐ Minerals													
Other: _____															
After test of well yield, water was															
☐ Clear and sediment free															
☐ Other, specify _____															
Chlorinated ☐ Yes ☒ No															

Depth Interval - Meters		Material and type (bentonite slurry, neat cement slurry) etc:	☐ Annular space	☒ Abandonment
From	To		Volume Placed (cubic meters)	
0	3.04	Bentonite		

Method of Construction					
☐ Cable Tool	☐ Rotary (air)	☐ Diamond	☐ Digging		
☐ Rotary (conventional)	☐ Air percussion	☐ Jailing	☐ Other		
☐ Rotary (reverse)	☐ Boring	☐ Drilling			
Water Use					
☐ Domestic	☐ Industrial	☐ Public Supply	☐ Other		
☐ Stock	☐ Commercial	☐ Not used			
☐ Irrigation	☐ Municipal	☐ Cooling & air conditioning			
Final Status of Well					
☐ Water Supply	☐ Recharge well	☐ Unfinished	☒ Abandoned, (Other)		
☐ Observation well	☐ Abandoned, insufficient supply	☐ Dewatering			
☐ Test Hole	☐ Abandoned, poor quality	☐ Replacement well			

Well Contractor/Technician Information	
Name of Well Contractor	Well Contractor's Licence No.
All-Terrain Drilling Ltd.	1129
Business Address (street name, number, city etc.)	
3-6661 (bypass Dr. Waterloo, ON	N2V 1C2
Name of Well Technician (last name, first name)	Well Technician's Licence No.
Grant Am Pollice, Mike	268
Signature of Technician/Contractor	Date Submitted
	3 May 1998

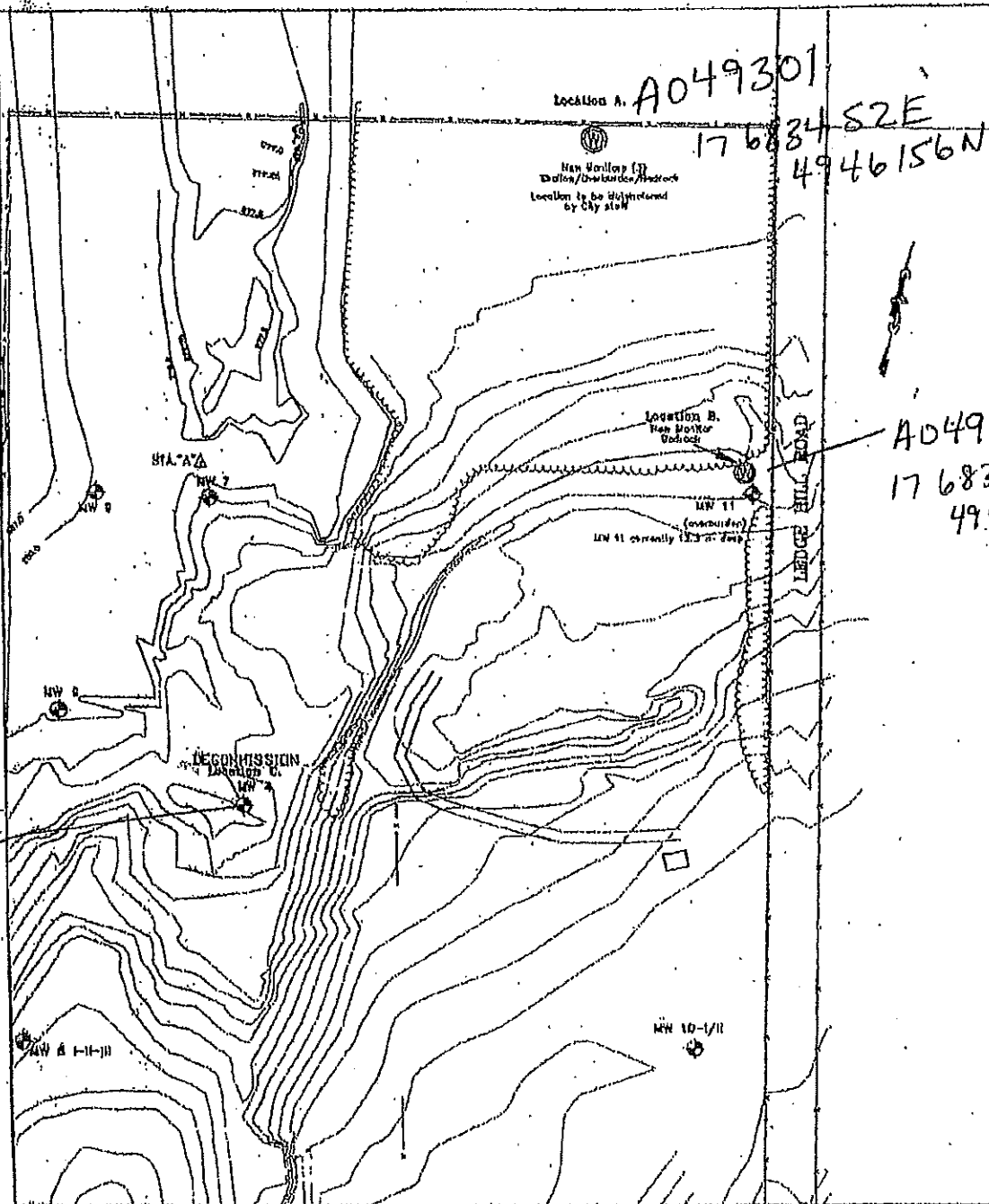
Location of Well			
In diagram below show distances of well from road, lot line, and building: Indicate north by arrow. - Abandoned well listed as MW-4 on attached map.			
Audit No. 2 73956		Date Well Completed 2806 12 0	
Was the well owner's information package delivered? ☐ Yes ☒ No		Date Delivered yyy yyy	

Ministry Use Only									
Data Source					Contractor				
Data Received		YYYY	MM	DD	Date of Inspection		YYYY	MM	DD
Remarks					Well Record Number				

05/01E (08/2006)

Well Owner's Copy

Cette formule est disponible en français



	Scale 1 : 2000	Date NOVEMBER 2006
	SOMERVILLE LANDFILL SITE	Figure 1

Ministry of
the Environment

Well Tag Number

A 049302

MW14

Well Record

Regulation 903 Ontario Water Resources Act

page 1 of 1

Instructions for Completing Form

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- Questions regarding completing this application can be directed to the Water Well Help Desk (Toll Free) at 1-888-396-9365.
- All metre measurements shall be reported to 1/10th of a metre.
- Please print clearly in blue or black ink only.

Well Owner's Information and Location of Well Information		MUN		CON		LOT	
First Name	Last Name	Mailing Address (Street Number/Name, RR, Lot, Concession)		Province		Postal Code	Telephone Number (include area code)
City of Kawartha Lakes	SO Wolfe St.	Ontario		K9V 2J2			
County/District/Municipality	Township/City/Town/Village	Address of Well Location (County/District/Municipality)		Township	Lot	Concession	
	Lindsay	Somerville Landfill		Somerville	13	3	
RR/Street Number/Name	City/Town/Village	Site/Compartment/Block/Tract etc.					
381 Ledgell Road	Kawartha Lakes						
GPS Reading	NAD	Zone	Eastings	Northings	Unit (Make/Model)	Mode of Operation:	☐ Unfiltered/vented ☒ Filtered/vented
813 171 1583437	14946169	Magellan					

Log of Overburden and Bedrock Materials (see Instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Metres To
Brown	FILL	silt, sand, gravel	saturated	0	0.9
Brown, Grey	Sand	silt, gravel	very fine to fine sand, moist, dense	0.9	4.8
Brown	Sand	silt, gravel	fine sand, dense, moist	4.8	6.82
Green	Clay		dense	6.82	6.87
Brown, Grey	Sand, gravel	silt	moist, silty sand, gravel	6.87	8.2
Green	Bedrock - limestone		irregular, fractured beyond 13.1	8.2	18.2

Hole Diameter			Construction Record				Test of Well Yield					
Depth From	Metres To	Diameter Centimetres	Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Metres To	Pumping test method	Draw Down Time min	Water Level Metres	Recovery Time min	Water Level Metres
0	8.22	20						Pump Intake set at - (metres)				
8.22	18.2							Pumping rate - (litres/min)	1		1	
Water Record			Casing				Duration of pumping					
Water found at	Metres	Kind of Water	5.0	☐ Steel ☐ Fibreglass ☒ Plastic ☐ Concrete ☐ Galvanized	4	10.8	15.0	hrs + min	2		2	
☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			Final water level and of pumping	metres	3		3	
☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			Recommended pump type	☐ Shallow ☐ Deep	4		4	
☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			Recommended pump depth	metres	6		6	
After test of well yield, water was			Screen				Recommended pump rate					
☐ Clear and sediment free ☐ Other, specify			Outside diam	☐ Steel ☐ Fibreglass ☒ Plastic ☐ Concrete ☐ Galvanized	Slot No.	15.0	18.1	(litres/min)	10		10	
Chlorinated ☐ Yes ☐ No								If flowing give rate - (litres/min)	16		15	
			No Casing or Screen				20					
			☐ Open hole				25					
							30					
							40					
							50					
							60					

Plugging and Sealing Record			☒ Annular space ☐ Abandonment	
Depth set at -	Metres To	Material and type (portland slurry, neat cement slurry) etc.	Volume Placed (cubic metres)	
0	0.3	Cement		
0.3	14.4	Benbrite		
14.4	18.2	Sand		
Method of Construction				
☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Drilling				
☐ Rotary (conventional) ☐ Air percussion ☐ Jelling ☐ 45°				
☐ Rotary (reverse) ☐ Boring ☐ Driving				
Water Use				
☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other				
☐ Stock ☐ Commercial ☐ Not used				
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning				
Final Status of Well				
☐ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned (Other)				
☒ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering				
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well				
Well Contractor/Technician Information				
Name of Well Contractor	Well Contractor's Licence No.			
All-Terrain Drilling Ltd.	1128			
Business Address (street name, number, city etc.)	268			
3-661 Colby Dr. Waterloo, ON	N2V 1C2			
Name of Well Technician (last name and name)	Well Technician's Licence No.			
Grant, Don	208			
Signature of Well Technician/Contractor	Date Submitted			
	2017/10/12			

Location of Well	
In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.	
See attached.	
Audit No.	Date Well Completed
Z 73955	2006/12/06
Was the well owner's information package delivered?	Date Delivered
☒ Yes ☐ No	YYYY MM DD
Ministry Use Only	
Date Received	Contractor
YYYY MM DD	YYYY MM DD
Remarks	Well Record Number

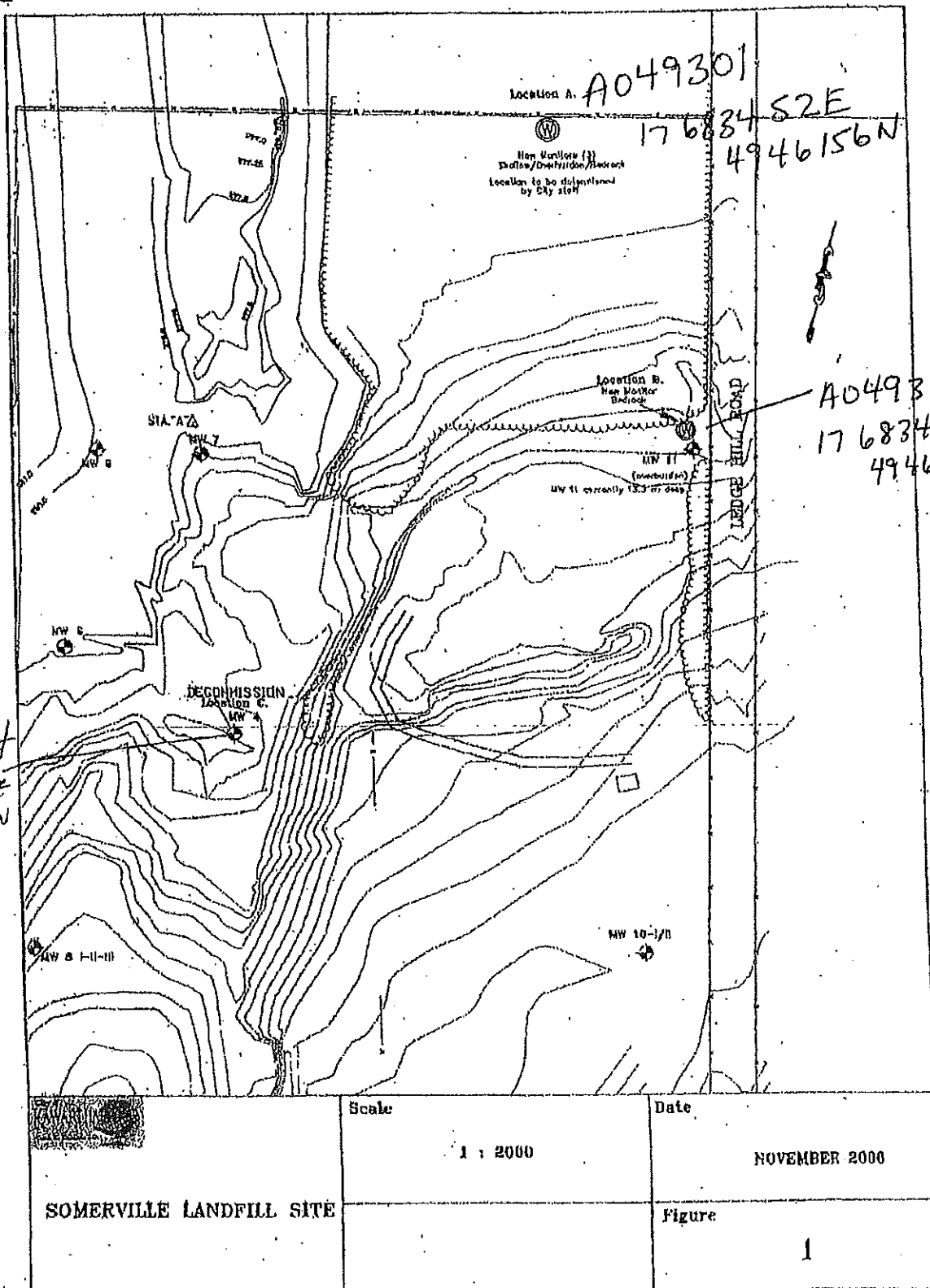
4049302

BOREHOLE LOG	PROJECT: BMH	BOREHOLE: MW 3
Hydrogeological Investigations BIOCH/Donner/Property Somerville Landfill FOR: County of Victoria		MW14 DATE: DEC 6/06 GEOLOGIST ALL TERRAIN ELEVATION

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE						N VALUE				WATER CONTENT (%)			
				NUMBER	INTERVAL	TYPE	N VALUE	% WATER	% REC	% ROD							
0.9		Fill - silty sand + gravel saturated, brown	1	SS	3			80						15	30	45	60
1.52		very fine sand, some silt, trace gravel brown, grey, moist	2	SS	11			90									
3.0		fine sand, trace silt, trace gravel moist, dense, grey	3	SS	51			55									
4.5			4	SS	69			80									
4.8		fine sand, brown, moist															
4.82		fine sand, trace silt, trace gravel moist, dense, grey															
5.1		fine sand, brown, moist															
5.12		fine sand, trace silt, trace gravel moist, dense, grey															
6.0			5	SS	94			80									
6.59		fine sand, brown, grey															
6.72		clay, grey, dense															
6.87																	
7.6		silty sand + gravel brown, grey, moist,	6	SS	60			40									

BOREHOLE LOG	PROJECT: Eden	BOREHOLE: MW B
Hydrogeological Investigations Eden Landfill Property SOMERVILLE LANDFILL FOR: County of Victoria		DATE: DEC 6/06 GEOLOGIST: ALL TERRAIN ELEVATION:

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE					N VALUE					WATER CONTENT (%)				
				INTERVAL	TYPE	N VALUE	% WATER	% REC	% EQD	15	30	45	60	10	20	30	40	50
8.2		assumed bedrock 8.2 m limestone, grey, competent			AR													
13.1		Becoming fractured beyond 13.1 m																
14.4		Increasing return of water																
15																		
18.2		Borehole terminated at 18.2 m in shaley limestone																





Ministry of
the Environment

Well Tag Number **A 049301**

A049301

MW15

Well Record

Regulation 903 Ontario Water Resources Act

page **1** of **2**

Instructions for Completing Form

- For use in the Province of Ontario only. This document is a permanent legal document. Please retain for future reference.
- All Sections must be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Help Desk (Toll Free) at 1-888-398-9355.
- All metre measurements shall be reported to 1/10th of a metre.
- Please print clearly in blue or black ink only.

Well Owner's Information and Location of Well Information				Ministry Use Only			
First Name	Last Name	Mailing Address (Street Number/Name, RR, Lot, Concession)		MUN	CON		LOT
City of Kawartha Lakes		50 Wolfe St.					
County/District/Municipality		Township/City/Town/Village	Province	Postal Code	Telephone Number (include area code)		
Lindsay		Lindsay	Ontario	K9V 2J2			
Address of Well Location (County/District/Municipality)		Township	Lot	Concession			
Somerville Landfill		Somerville	13	3			
RR#/Street Number/Name		City/Town/Village	Site/Compartment/Block/Tract etc.				
381 Leitch Road		Kawartha Lakes					
GPS Reading	NAD 83 Zone Easting	Nothing	Unit Make/Model	Mode of Operation	☐ Unfiltered ☒ Averaged		
1813	17A 1683452	4946156	Magellan		☐ Differentiated, specify		

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From Metres	Metres To
Black, Brown	Peat	organics	moist	0	0.07
Brown	Silt	limestone cobble, sand, gravel	moist, sandy, silt	0.07	1.52
	Bedrock - Limestone		shaley limestone	1.52	8.88

Hole Diameter			Construction Record				Test of Well Yield				
Depth From	Metres To	Diameter Centimetres	Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Metres To	Pumping test method	Draw Down	Recovery	
								Time min <th>Water Level Metres</th> <th>Time min</th> <th>Water Level Metres</th>	Water Level Metres	Time min	Water Level Metres
0	9.88	20									
			Casing								
			5.0	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.4	+0.3	5.84	Pump Intake set at (metres)	Static Level		
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Pumping rate (litres/min)	1	1	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Duration of pumping	2	2	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Final water level and of pumping	3	3	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Recommended pump type	4	4	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Recommended pump depth	5	5	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				Recommended pump rate	10	10	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				If flowing give rate (litres/min)	15	15	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized				If pumping discontinued, give reason.	20	20	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized					25	25	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized					30	30	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized					40	40	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized					50	50	
				☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized					60	60	

Plugging and Sealing Record			☒ Annular space	☐ Abandonment
Depth set at	Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)	
0	0.3	Cement		
0.3	4.7	Bentonite		
4.7	8.88	Sand		

Method of Construction			
☐ Cable Tool	☐ Rotary (air)	☐ Diamond	☐ Digging
☐ Rotary (conventional)	☐ Air percussion	☐ Jacking	☒ Other
☐ Rotary (reverse)	☐ Boring	☐ Drilling	Hand
Water Use			
☐ Domestic	☐ Industrial	☐ Public Supply	☒ Other
☐ Stock	☐ Commercial	☐ Not used	Refrigeration
☐ Irrigation	☐ Municipal	☐ Cooling & air conditioning	

Final Status of Well	
☐ Water Supply	☐ Recharge well
☒ Observation well	☐ Unfinished
☐ Test Hole	☐ Abandoned, insufficient supply
	☐ Dewatering
	☐ Abandoned, poor quality
	☐ Replacement well

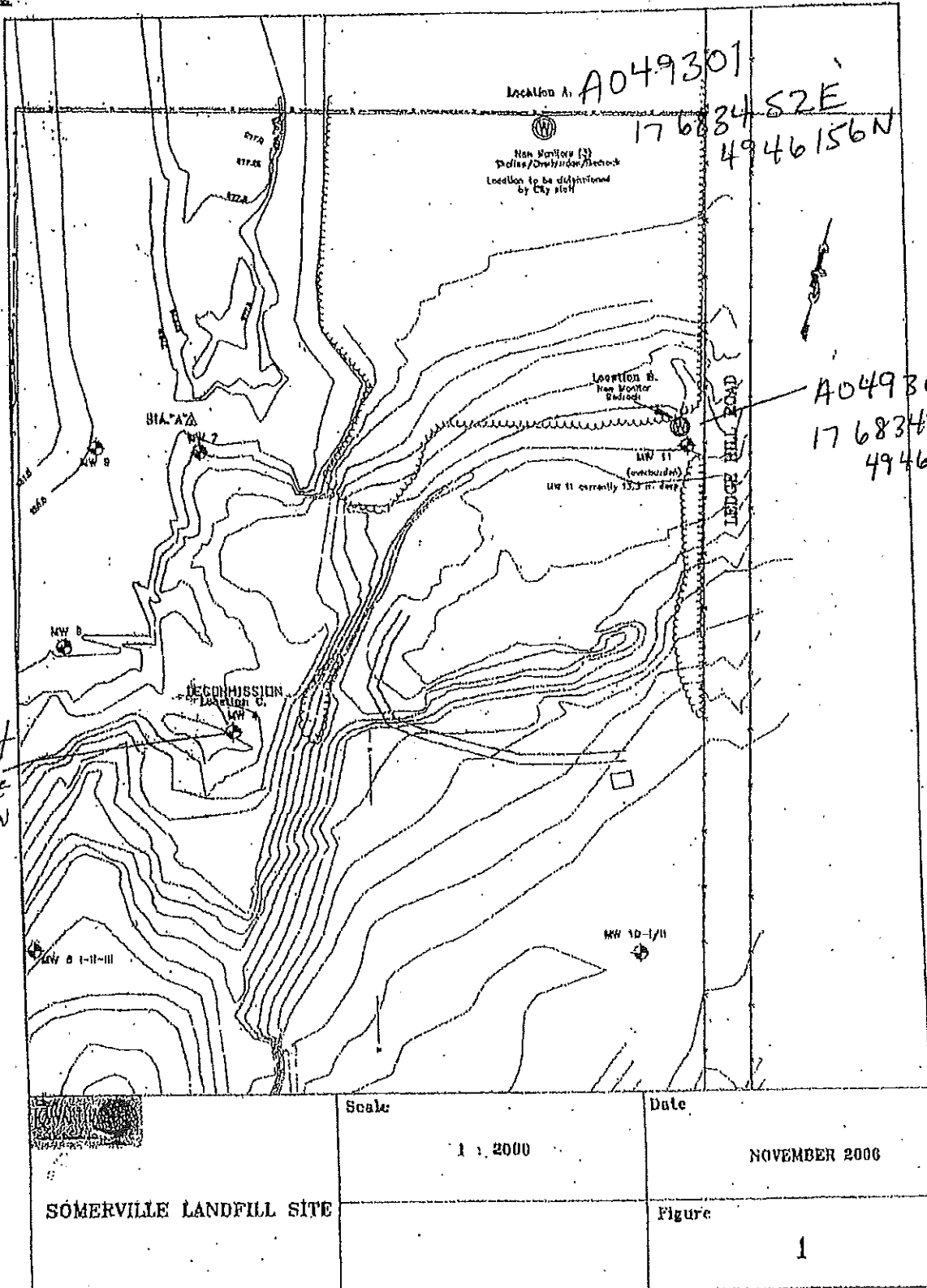
Well Contractor/Technician Information	
Name of Well Contractor	Well Contractor's Licence No.
All-Terrain Drilling Ltd.	1128
Business Address (street name, number, city etc.)	
3-661 Colby Drive, Waterloo, ON N2V 1C2	
Name of Well Technician (last name, first name)	Well Technician's Licence No.
Grant, Don Felice, Mike	268
Signature of Technician/Contractor	Date Submitted
	2007/01/12

Location of Well	
In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.	
- See attached	

Ministry Use Only	
Auth No. Z 73954	Date Well Completed 2006/12/06
Was the well owner's information package delivered? ☒ Yes ☐ No	Date Delivered 2007/01/12

Ministry Use Only	
Date Received YYYY MM DD	Date of Inspection YYYY MM DD
Remarks	Well Record Number

Printed on Feb 00





Peterborough
Barrie
Oshawa
T: 866-217-7900
www.cambium-inc.com

Log of Borehole: MW 16-I

Page 1 of 2

Client: City of Kawartha Lakes
Contractor: Canadian Environmental Drilling
Location: Somerville WDS

Project Name: Installation of Monitoring Wells
Method: 8' Hollow Stem and 4.5' Air Hammer
UTM: _____

Project No.: 5210-001
Date Completed: Sep 13, 2016
Elevation: _____

SUBSURFACE PROFILE				SAMPLE				Well Installation	Remarks
(ft) Depth (m)	Lithology	Description	Number	Type	% Recovery	SPT (n)/RQD			
-5									
-1									
0									
1		Fill: Brown fine to medium sand, dry, loose (Fill)	1	SS	83	10			
5			2	SS	75	19			
2			3	SS	83	24			
10		Silty Sand: grey fine to very fine silty sand, trace coarse sand, fining down, very stiff, disturbed cross bedding evident of dewatered post deposition, rip-ups evident which could increase vertical conductivity.	4	SS	83	33			
15			5	SS	92	35			
20			6	SS	100	46			
25			7	SS	100	64			
30			8	SS	38	>100			
35			9	SS	46	96			
40			10	SS	21	>100			
45									
50		Sand: Soft grey / brown medium to fine sand with trace rounded cobbles at depth.	11	HQ	100	Very Poor			
55		Till: Till, dark grey, fine sand with trace coarse sand and angular gravel, very dense,	12	HQ	52	Very Poor			
60									

J-Plug

Concrete

0.038 m diameter PVC standpipe

Bentonite Chips

Well installed with lockable casing and sample tubing

Logged By: Mike B.

Input By: Cameron M.



**Peterborough
Barrie
Oshawa**
T: 866-217-7900
www.cambium-inc.com

Log of Borehole: MW 16-I

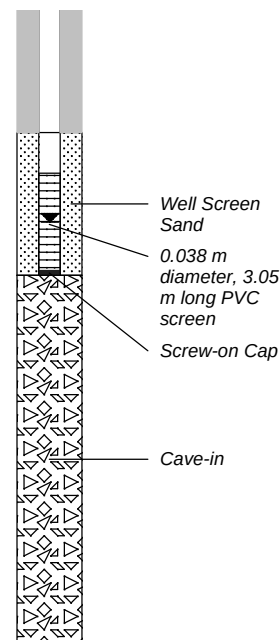
Page 2 of 2

Client: City of Kawartha Lakes
Contractor: Canadian Environmental Drilling
Location: Somerville WDS

Project Name: Installation of Monitoring Wells
Method: 8' Hollow Stem and 4.5' Air Hammer
UTM: _____

Project No.: 5210-001
Date Completed: Sep 13, 2016
Elevation: _____

SUBSURFACE PROFILE				SAMPLE				Well Installation	Remarks
(ft) Depth (m)	Lithology	Description	Number	Type	% Recovery	SPT (n)/RQD			
60		moist.	13	HQ	72	Fair			
19			14	HQ	95	Poor			
65		Limestone: Limestone (Mudstone) encountered at 18.29 mBGS. Upper Kirkfield Fm. (Upper Bobcaygeon Fm). Crystalline very fine mudstone, thin nodular bedded, clay seams every couple inches, calcite and iron scale on weathered surfaces, black specs on core suggesting period of lesser deposition.	15	HQ	92	Fair			
70			16	HQ	47	Poor			
75			17	HQ	55	Fair			
80			18	HQ	81	Good			
25			19	HQ	100	Excellent			
85		Limestone: (Argillaceous Limestone) Lower Kirkfield Fm. (Middle Bobcaygeon) [Gradational Contact]. Thin to medium bedded fine grainstone with coarser chrinoidal debris interbedded, voids and vugs from 20.73 to 23.84 m, drops from 0.02 to 0.10 m common. Increasingly competent with depth below 23.84 m with better core recovery, calcite vugs and bioturbation evident.	20	HQ	98	Excellent			
90									
28									
95									
29									
100									
30									
105									
31									
110									
32									
115									
33									
120									
34									
125									
35									
36									
37									
38									



Water level = 21.47 mBGS (22.38 mTOP) on Oct 12, 2016

Well depth = 22.26 mBGS (23.17 mTOP)

Logged By: Mike B.

Input By: Cameron M.



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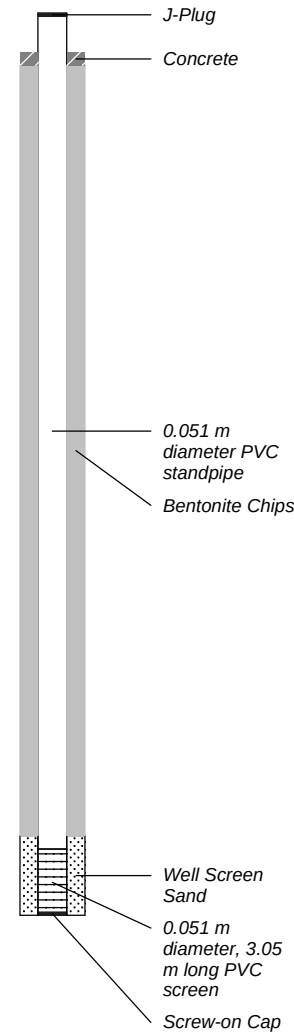
Log of Borehole: MW 16-II

Page 1 of 1

Client: City of Kawartha Lakes
Contractor: Canadian Environmental Drilling
Location: Somerville WDS

Project Name: Installation of Monitoring Wells
Method: 8' Hollow Stem and 4.5' Air Hammer
UTM: _____

Project No.: 5210-001
Date Completed: Sep 12, 2016
Elevation: _____

SUBSURFACE PROFILE				SAMPLE				Well Installation	Remarks
(ft) Depth (m)	Lithology	Description	Number	Type	% Recovery	SPT (n)/RQD			
-5									
-1									
0			1	SS	83	10			Well installed with lockable casing and sample tubing
1		Fill: Brown fine to medium sand, loose, dry (Fill)	2	SS	75	19			
5			3	SS	83	24			
2			4	SS	83	33			
10			5	SS	92	35			
15		Silty Sand: Grey silty fine sand, stiff to dense, sporadic broken cobbles, dry	6	SS	100	46			Well did not intercept a water bearing formation.
20			7	SS	100	64			
25			8	SS	38	>100			
30			9	SS	46	96			
35		Note: Tri-cone was used after 7.62 mBGS for borehole advancement until bedrock	10	SS	21	>100			
40									
45									
50									
55		Fine Sand: Grey fine sand, some silt/clay, very dense, some moisture	11	HQ	100	Very Poor			
60			12	HQ	52	Very Poor			
65			13	HQ	72	Fair			
70			14	HQ	95	Poor			
75		Limestone: Limestone (Mudstone) Bedrock encountered at 16.1 at mBGS Upper Kirkfield Fm (Upper Bobcaygeon Fm). Crystalline very fine mudstone, thin nodular bedded, clay seems every couple inches, calcite and iron scale on weathered surfaces, black specs on core suggesting period of lesser deposition. Borehole terminated at 24.54 mBGS							
80									
85									
90									
95									

Logged By: Cameron M.

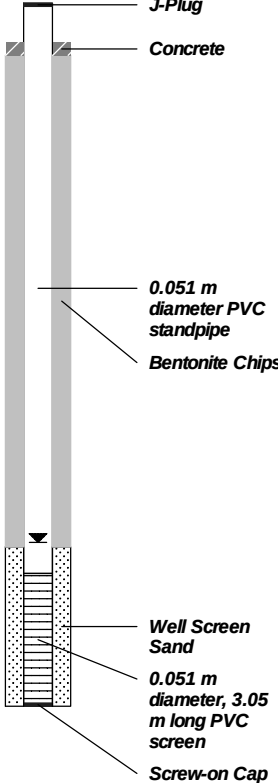
Input By: Cameron M.

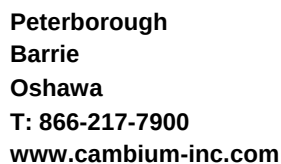


Client: City of Kawartha Lakes
Contractor: Canadian Environmental Drilling
Location: Somerville WDS

Project Name: Installation of Monitoring Wells
Method: 8' Hollow Stem and 4.5' Air Hammer
UTM: _____

Project No.: 5210-001
Date Completed: September 7, 2016
Top of Pipe Elevation: _____

SUBSURFACE PROFILE			SAMPLE			Well Installation	Remarks
(ft) Depth (m)	Lithology	Description	Number	Type	% Recovery		
-5 -1 0 1 5 2 10 3 15 4 20 6 25 7 30 8 35 10 40 12 45 14 50 15 55 16 60 18 65 20 70 21 75 23 80 24 85 26 90 27 95 28							
		Fill: Brown fine to medium sand, dry, loose (Fill)	1	SS	83		Well installed with lockable casing and sample tubing
			2	SS	75		
			3	SS	83		
			4	SS	83		
			5	SS	92		
		Silty Sand: Grey silty fine sand, dry, stiff to dense, sporadic broken cobbles	6	SS	100		
			7	SS	100		
		Note: Tri-cone was used after 7.62 mBGS for borehole advancement until bedrock	8	SS	38		
			9	SS	46		
			10	SS	21		
		Fine Sand: Grey fine sand, some silt/clay, very dense, some moisture					Water Level = 11.485 mBGS (12.385 mTOP) on Oct 12, 2016 Well depth = 15.24 mBGS (16.15 mTOP)
		Borehole terminated at 15.24 mBGS in fine sand					



Page 1 of 1

Client: City of Kawartha Lakes
Contractor: Canadian Environmental Drilling
Location: Somerville WDS

Method: 8' Hollow Stem

UTM:

Date Completed: September 16, 2010

Top of Pipe Elevation: _____

Logged By: Cameron M. **Input By:** Cameron M.



BOREHOLE NO. GP1

PAGE 1 of 1

PROJECT NAME: CITY OF KAWARTHA LAKES - SOMERVILLE LANDFILL

PROJECT NO.: 171-00763-00

CLIENT: CITY OF KAWARTHA LAKES

DATE COMPLETED: Jan 27, 2017

BOREHOLE TYPE: DIRECT PUSH/ 210 mm DIA. AIR ROTARY METHOD

SUPERVISOR: TB

GROUND ELEVATION: NOT SURVEYED

REVIEWER: JSA

DEPTH (m) ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE					CONE PENETRATION "N" VALUE 10 20 30 SHEAR STRENGTH 50 100 150 200 Intact (Max) Cu Remoulded Cu	WATER CONTENT % 10 20 30 W _p W _L	UTM CO-ORDINATES UTM Zone: NAD: Easting: Northing:	REMARKS
				TYPE	N VALUE	% WATER	% RECOVERY	PLD/TOV (ppm)				
0.0	TOPSOIL Dark brown TOPSOIL.											
0.3	SAND AND GRAVEL Brown to light brown SAND AND GRAVEL, some to trace silt, occasional cobbles noted, moist			DP1								Monitor completed as gas probe with PVC slip cap with 1/4" sampling port. Gas probe installed with 50 mm inner diameter, schedule 40 PVC risers, with a 3.05 m length No. 10 screen size well screen installed at the water table (13.7 m below ground surface).
1.0												
2.0				DP2								
3.0												
4.0				DP3								
5.0												
6.0				DP4								
7.0												
8.0				DP5								
9.0												
10.0				DP6								
10.7												
11.0	SILTY SAND TILL Light brown SILTY SAND TILL, some to trace gravel, with cobbles and boulders, moist			DP8								
12.0												
13.0				DP9								
14.0	- wet to saturated											Groundwater encountered at 13.7 m below ground surface during drilling.
15.0				DP10								
15.2	Borehole terminated at 15.2 m below ground surface in SILTY SAND TILL.											
16.0												

WSP GEOTECH (METRIC) WITH UTM AND MASL SUMERVILLE BOREHOLE LOGS.GPJ WSP_ENV_V1.GDT 3/20/17

PROJECT NAME: CITY OF KAWARTHA LAKES - SOMERVILLE LANDFILL

PROJECT NO.: 171-00763-00

CLIENT: CITY OF KAWARTHA LAKES

DATE COMPLETED: Jan 31, 2017

BOREHOLE TYPE: DIRECT PUSH/ 210 mm DIA. AIR ROTARY METHOD

SUPERVISOR: TB

GROUND ELEVATION: NOT SURVEYED

REVIEWER: JSA

[illegible]

Log of Borehole TH201

Project No. MRK-00256269-A0

Drawing No. 1

Project: City of Kawartha Landfill Sites

Sheet No. 1 of 2

Location: Various Landfill Sites, Kawartha Lakes

Somerville Landfill

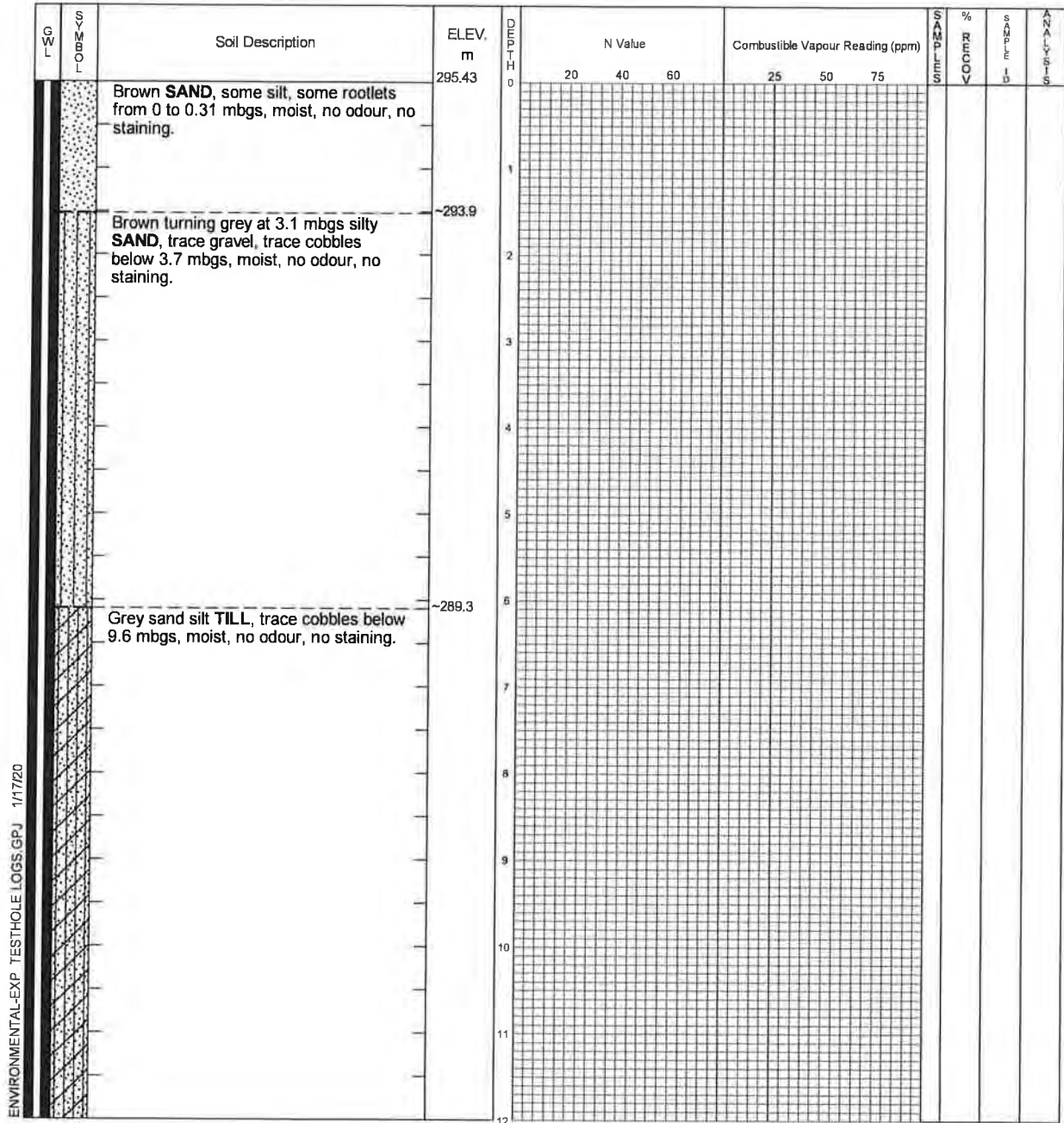
Date Drilled: October 15-17, 2018

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

Drill Type: CME-75 Track Mount

Datum: _____



Continued Next Page



exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Time	Water Level (m)	Depth to Cave (m)

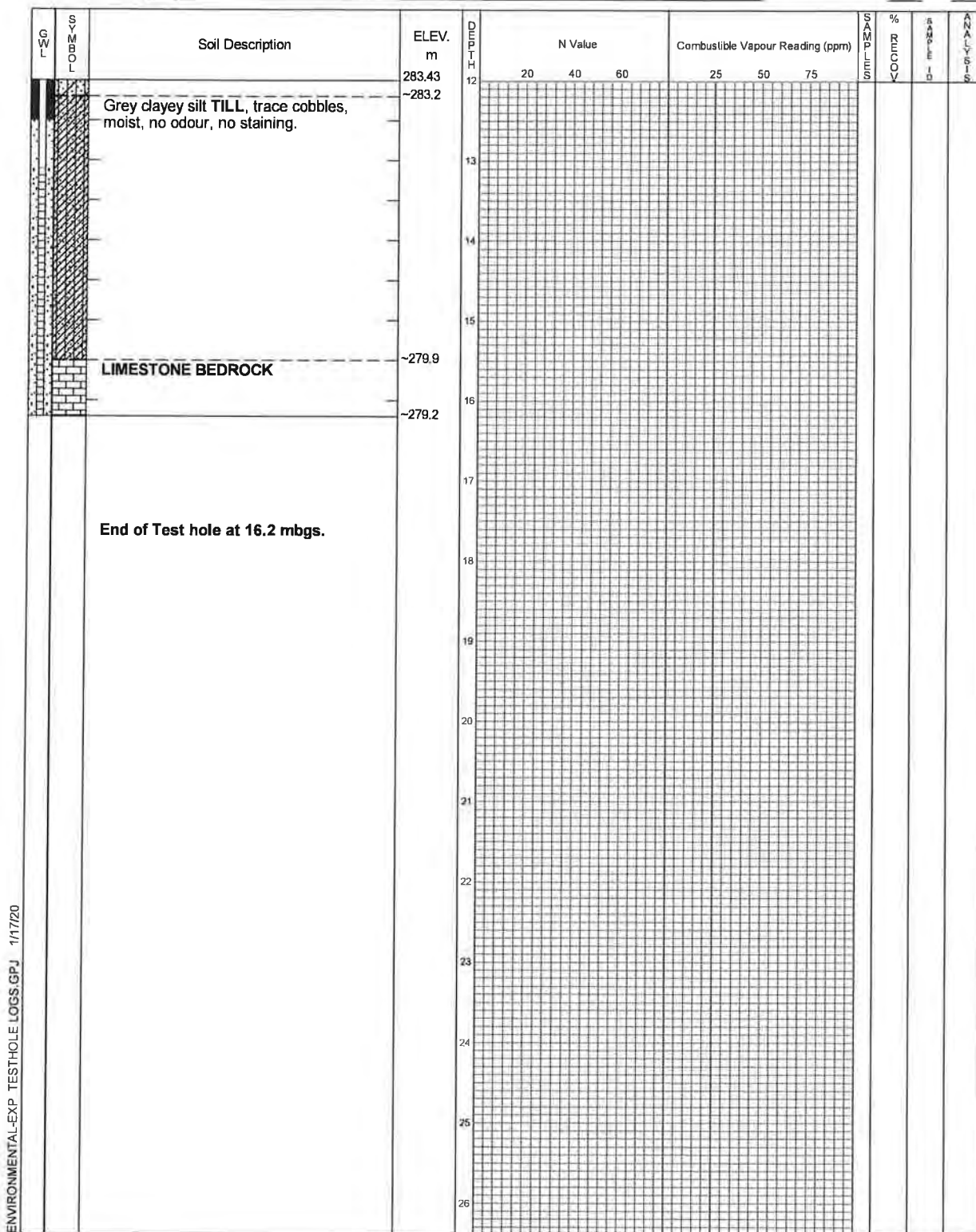
Log of Borehole TH201

Project No. MRK-00256269-A0

Drawing No. 1

Project: City of Kawartha Landfill Sites

Sheet No. 2 of 2



exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Time	Water Level (m)	Depth to Cave (m)

Log of Borehole TH201D

Project No. MRK-00256269-A0

Drawing No. 2

Project: City of Kawartha Landfill Sites

Sheet No. 1 of 3

Location: Various Landfill Sites, Kawartha Lakes

Somerville Landfill

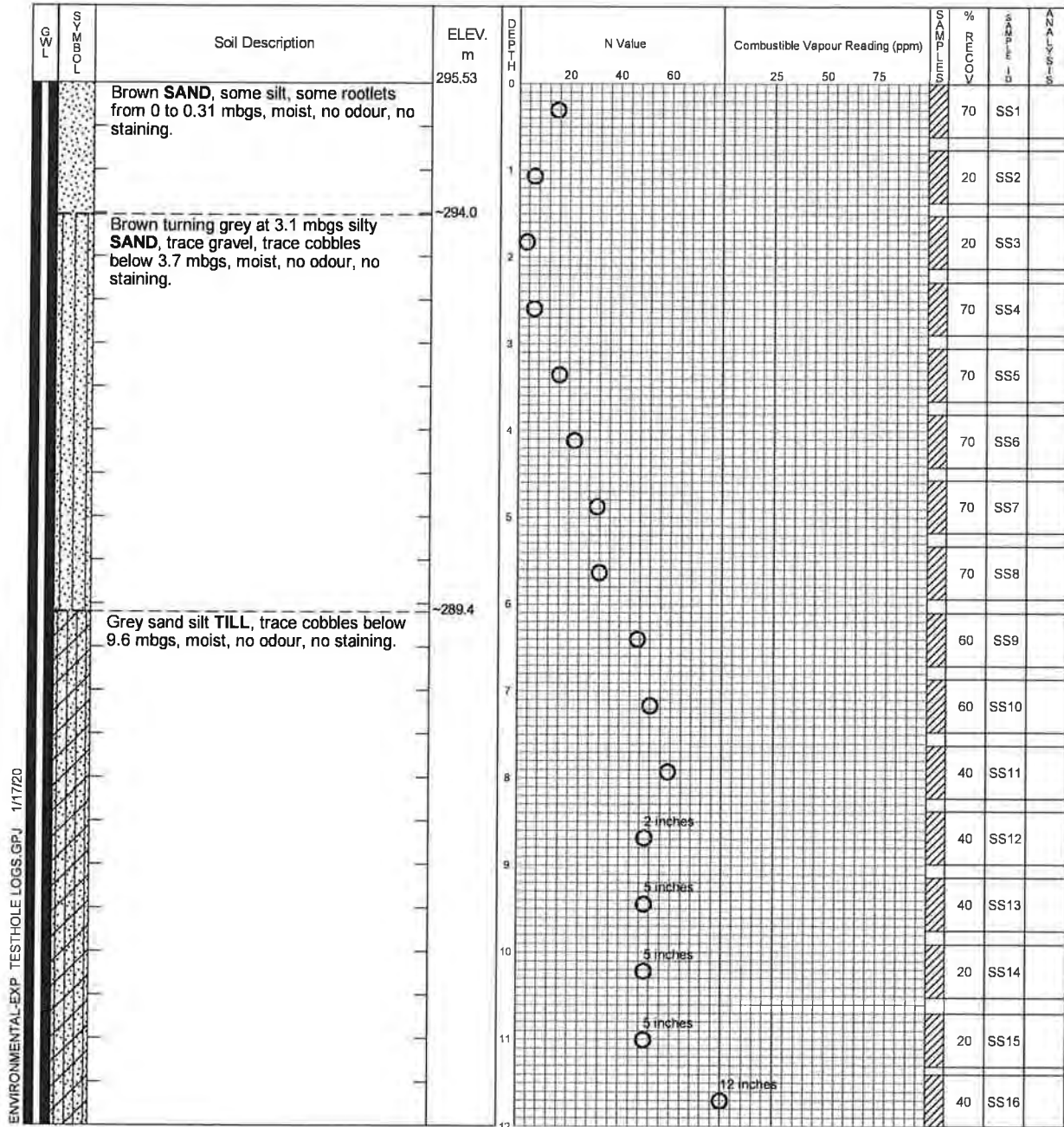
Date Drilled: October 17-18 2019

Chemical Analysis

Drill Type: CME-75 Track Mount

Datum: _____

BTEX Benzene, Toluene, Ethylbenzene and Xylenes * Duplicate Sample
 ING Metals and Inorganics PCB Polychlorinated Biphenyls
 MET Metals PHC Petroleum Hydrocarbons (F1-F4)
 PAH Polycyclic Aromatic Hydrocarbons VOC Volatile Organic Compounds
 PEST Organochlorine Pesticides



Continued Next Page



exp Services Inc.
 Markham, Ontario
 Telephone: 905.695.3217

Time	Water Level (m)	Depth to Cave (m)

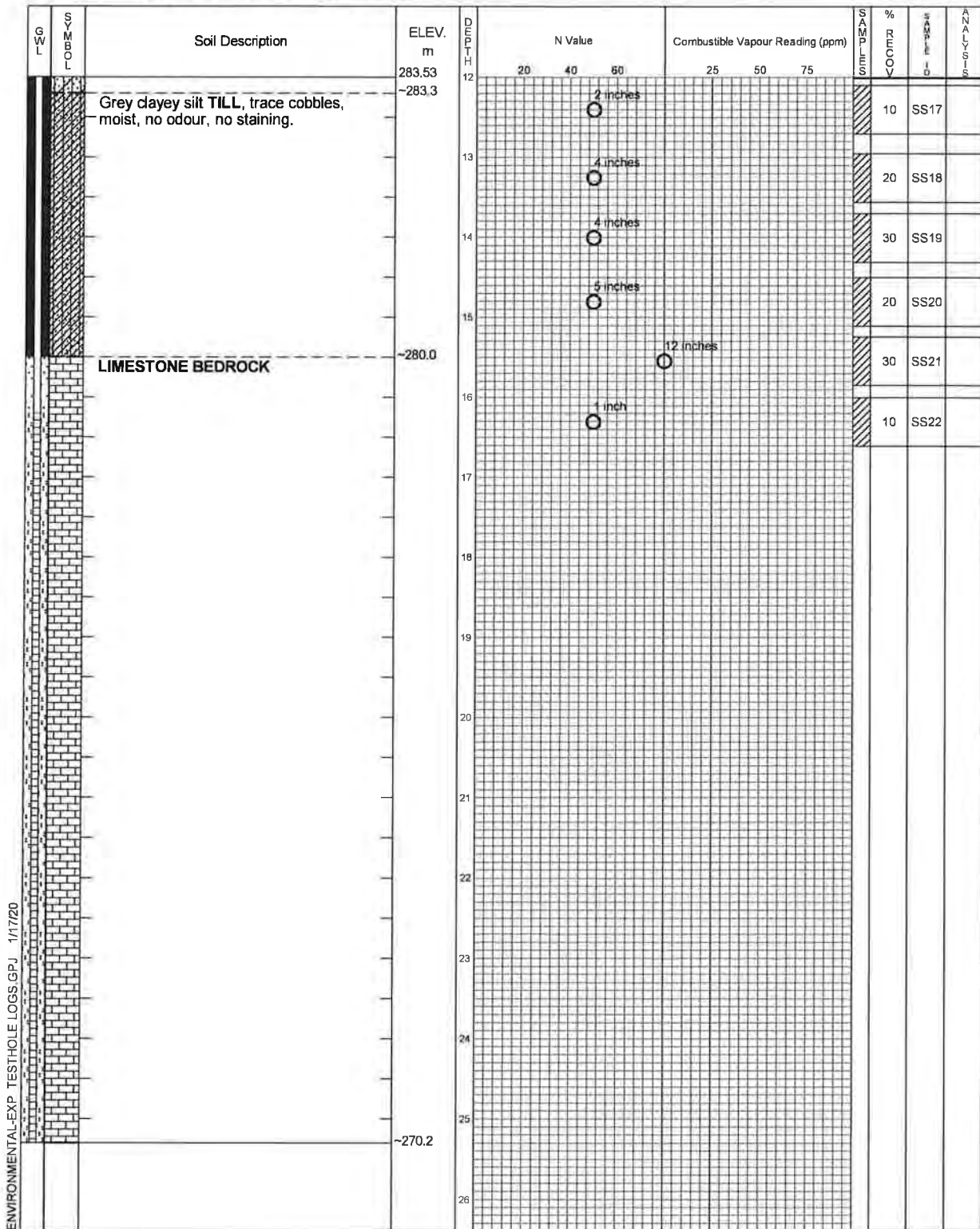
Log of Borehole TH201D

Project No. **MRK-00256269-A0**

Drawing No. **2**

Project: **City of Kawartha Landfill Sites**

Sheet No. **2** of **3**



Continued Next Page

Time	Water Level (m)	Depth to Cave (m)

Log of Borehole TH201D

Project No. MRK-00256269-A0

Drawing No. 2

Project: City of Kawartha Landfill Sites

Sheet No. 3 of 3

GWL	SOIL TYPE	Soil Description	ELEV. m	DEPTH m	N Value			Combustible Vapour Reading (ppm)			SAMPLE ID	ANALYSIS
					20	40	60	25	50	75		
		End of Test hole at 25.3 mbgs.	269.13	27								
				28								
				29								
				30								
				31								
				32								
				33								
				34								
				35								
				36								
				37								
				38								
				39								
				40								

ENVIRONMENTAL-EXP TESTHOLE LOGS GPJ 1/17/20



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Time	Water Level (m)	Depth to Cave (m)

ROCK CORE LOG

BH TH 201-D

PROJECT City of Kawartha, RFQ	ORIENTATION Vertical	ELEVATION (m) 295.5	DATUM Geodetic	PROJECT NUMBER MRK00256269-A0
LOCATION Sommerville Landfill, Kawartha Lakes, Ontario	DATE STARTED 10/17/19	COMPLETED 10/18/19	LOGGED BY AM	DRAWING NUMBER 2A
CLIENT City of Karartha Lakes	DRILLER Pontil	DRILL TYPE CME 75 Track	CORE BARREL HQ	SHEET 1 of 2

ELEVATION (m)	DEPTH (m)	SYMBOL	GENERAL DESCRIPTION	JOINT CHARACTERISTICS							WEATHERING	STRENGTH	FRACTURE FREQUENCY	RUN NUMBER	RECOVERY (%)	RQD	WATER RECOVERY (%)	WATER COLOUR
				NO. OF SETS	JOINT TYPE	ORIENTATION	SPACING	ROUGHNESS	FILLING	APERTURE (mm)								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
279.2		///	- RUBBLE ZONE	1	B	F	VC	RU	T	0								
279.1			BOBCAYGEON FORMATION Fossiliferous Limestone											1	73	0	N/A	Beige
			Brown to grey-brown crinoidal limestone with calcarenites and nodular texture. Generally unweathered with the exception of RUN 1 and RUN 3, becomes increasingly laminated a 2-3 meters depth from bedrock surface, moderate strength. Discontinuities: Low recovery noted in RUN 1 possibly due to the rubble zone at the till-bedrock interface. Voids noted in RUN 8, while coring the drill string dropped abruptly between 22.96 and 23.50 m depth. Bedding joints are rough undulating, flat and at wide to close intervals, rough undulating vertical joints at 17.47, 19.31, 21.33, 22.77, 23.16, 23.36 and 24.08 m depth.	1	B	F	W	RU	T	0				2	100	100	N/A	Beige
	17			1	B	F	C	RU	T	0				3	100	60	N/A	Beige
				1	C	V		RU	T	0								
277.8																		
	18																	
				1	B	F	W	RU	T	0				4	100	91	N/A	Beige
	19			1	C	V		RU	T	0								
	20			1	B	F	W	RU	T	0				5	100	71	N/A	Beige
	21			1	B	F	C	RU	T	0				6	100	64	N/A	Beige
							W											

ROCK CORE LOG

BH TH 201-D

PROJECT City of Kawartha, RFQ	ORIENTATION Vertical	ELEVATION (m) 295.5	DATUM Geodetic	PROJECT NUMBER MRK00256269-A0
LOCATION Sommerville Landfill, Kawartha Lakes, Ontario	DATE STARTED 10/17/19	COMPLETED 10/18/19	LOGGED BY AM	DRAWING NUMBER 2A
CLIENT City of Karartha Lakes	DRILLER Pontil	DRILL TYPE CME 75 Track	CORE BARREL HQ	SHEET 2 of 2

ELEVATION (m)	DEPTH (m)	SYMBOL	GENERAL DESCRIPTION	JOINT CHARACTERISTICS								WEATHERING	STRENGTH	FRACTURE FREQUENCY	RUN NUMBER	RECOVERY (%)	RQD	WATER RECOVERY (%)	WATER COLOUR
				NO. OF SETS	JOINT TYPE	ORIENTATION	SPACING	ROUGHNESS	FILLING	APERTURE (mm)									
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19
273.0	22			1	C	V		RU	T	0					7	100	70	N/A	Beige
272.6	23		- VOID																
272.2			- VOID	1	B	F	C	RU	T	0					8	73	0	N/A	Beige
271.4	24																		
270.1	25			1	B	F	C	RU	T	0					9	100	0	N/A	Beige
	26		End of Borehole at 25.4 m																

EXP_ROCKCORE_KAWARTHA_LAKES_ROCK_CORE_LOGS.GPJ CORE_LOG.GDT 1/16/20

Log of Borehole TH202

Project No. MRK-00256269-A0

Drawing No. 3

Project: City of Kawartha Landfill Sites

Sheet No. 1 of 2

Location: Various Landfill Sites, Kawartha Lakes

Somerville Landfill

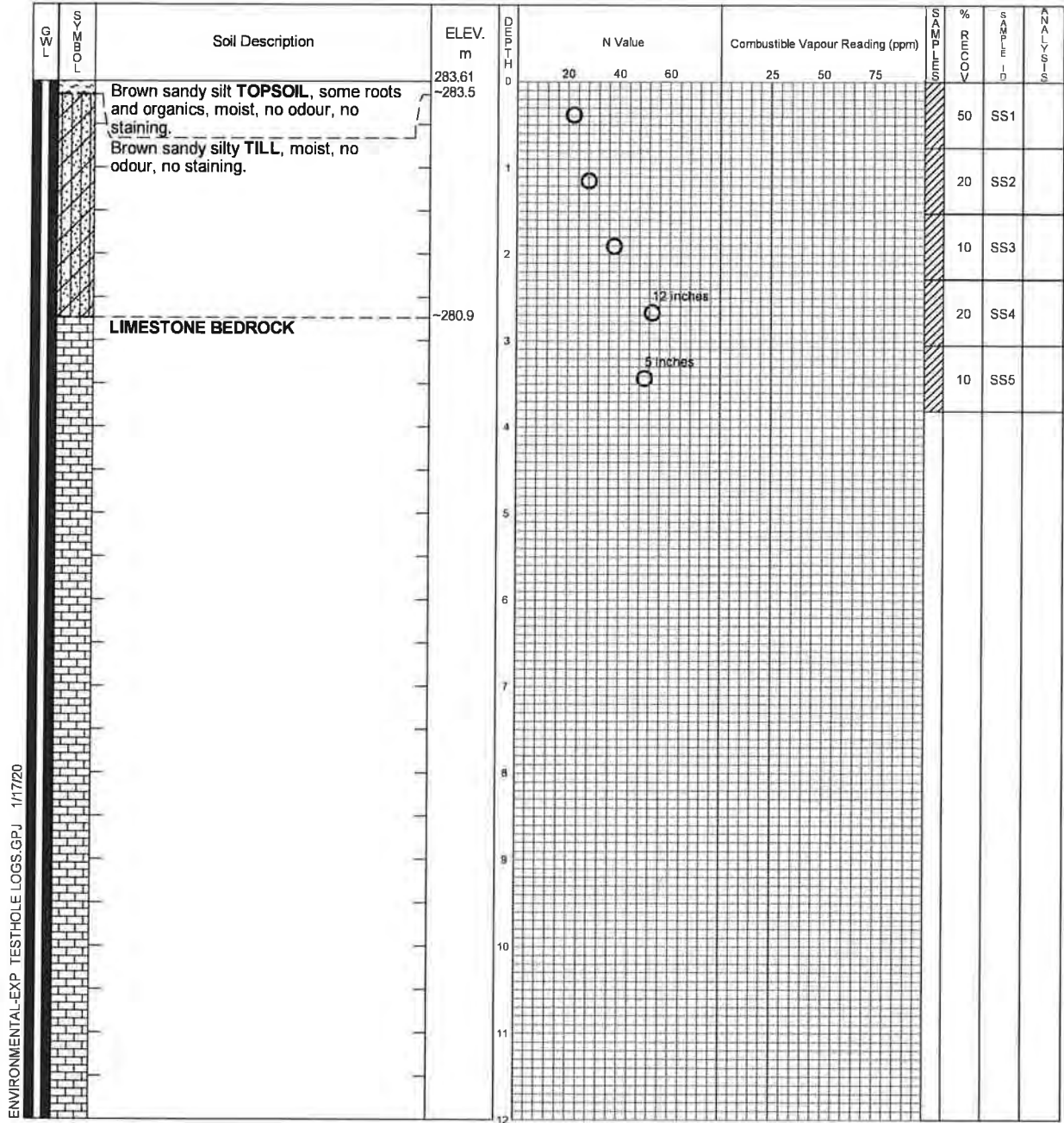
Date Drilled: October 22-23, 2019

Drill Type: CME-75 Track Mount

Datum: _____

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		



Continued Next Page



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Time	Water Level (m)	Depth to Cave (m)

Log of Borehole TH202

Project No. **MRK-00256269-A0**

Drawing No. **3**

Project: **City of Kawartha Landfill Sites**

Sheet No. **2** of **2**

SOIL SYMBOL	Soil Description	ELEV. m	DEPTH m	N Value			Combustible Vapour Reading (ppm)			SAMPLE ID	% MOISTURE	SAMPLE ID	ANALYSIS
				20	40	60	25	50	75				
		271.61	12										
			13										
			14										
			15										
			16										
	End of Test hole at 16.3 mbgs.	-267.3	17										
			18										
			19										
			20										
			21										
			22										
			23										
			24										
			25										
			26										

ENVIRONMENTAL-EXP TESTHOLE LOGS.GPJ 1/17/20



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Time	Water Level (m)	Depth to Cave (m)

ROCK CORE LOG

BH TH 202

PROJECT City of Kawartha, RFQ	ORIENTATION Vertical	ELEVATION (m) 283.6	DATUM Geodetic	PROJECT NUMBER MRK00256269-A0
LOCATION Sommerville Landfill, Kawartha Lakes, Ontario	DATE STARTED 10/22/19	COMPLETED 10/23/19	LOGGED BY AM	DRAWING NUMBER 3A
CLIENT City of Kawartha Lakes	DRILLER Pontil	DRILL TYPE CME 75 Track	CORE BARREL HQ	SHEET 1 of 2

ELEVATION (m)	DEPTH (m)	SYMBOL	GENERAL DESCRIPTION	JOINT CHARACTERISTICS								WEATHERING	STRENGTH	FRACTURE FREQUENCY	RUN NUMBER	RECOVERY (%)	RQD	WATER RECOVERY (%)	WATER COLOUR
				NO. OF SETS	JOINT TYPE	ORIENTATION	SPACING	ROUGHNESS	FILLING	APERTURE (mm)									
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19
276.5			BOBCAYGEON FORMATION Fossiliferous Limestone																
			Brown to grey-brown crinoidal limestone with calcarenites and nodular texture. Generally unweathered with the exception of RUN 1, becomes increasingly laminated a 2-3 meters depth from bedrock surface, moderate strength.	1	B	F	W	RU	T	0									
			Discontinuities: Low recovery due to numerous voids noted between RUNS 2, 3 and 4. bedding joints are rough undulating, flat and at wide to very close intervals; rough undulating vertical joints at 7.83, 8.00, 8.54, 12.95, 15.85, 16.06 and 16.25m depth.	1	C	V	C	RU	T	0					1	100	69	N/A	Beige
-8																			
				1	B	F	C	RU	T						2	83	58	N/A	Beige
				1	C	V		RU	T	0									
-9																			
-10				1	B	F	W	RU	T	0					3	90	75	N/A	Beige
							C												
-11																			
				1	B	F	C	RU	T	0					4	82	73	N/A	Beige
							W												
-12																			

ROCK CORE LOG

BH TH 202

PROJECT City of Kawartha, RFQ	ORIENTATION Vertical	ELEVATION (m) 283.6	DATUM Geodetic	PROJECT NUMBER MRK00256269-A0
LOCATION Sommerville Landfill, Kawartha Lakes, Ontario	DATE STARTED 10/22/19	COMPLETED 10/23/19	LOGGED BY AM	DRAWING NUMBER 3A
CLIENT City of Karartha Lakes	DRILLER Pontil	DRILL TYPE CME 75 Track	CORE BARREL HQ	SHEET 2 of 2

[illegible]

Log of Borehole TH203

Project No. MRK-00256269-A0

Drawing No. 4

Project: City of Kawartha Landfill Sites

Sheet No. 1 of 2

Location: Various Landfill Sites, Kawartha Lakes

Somerville Landfill

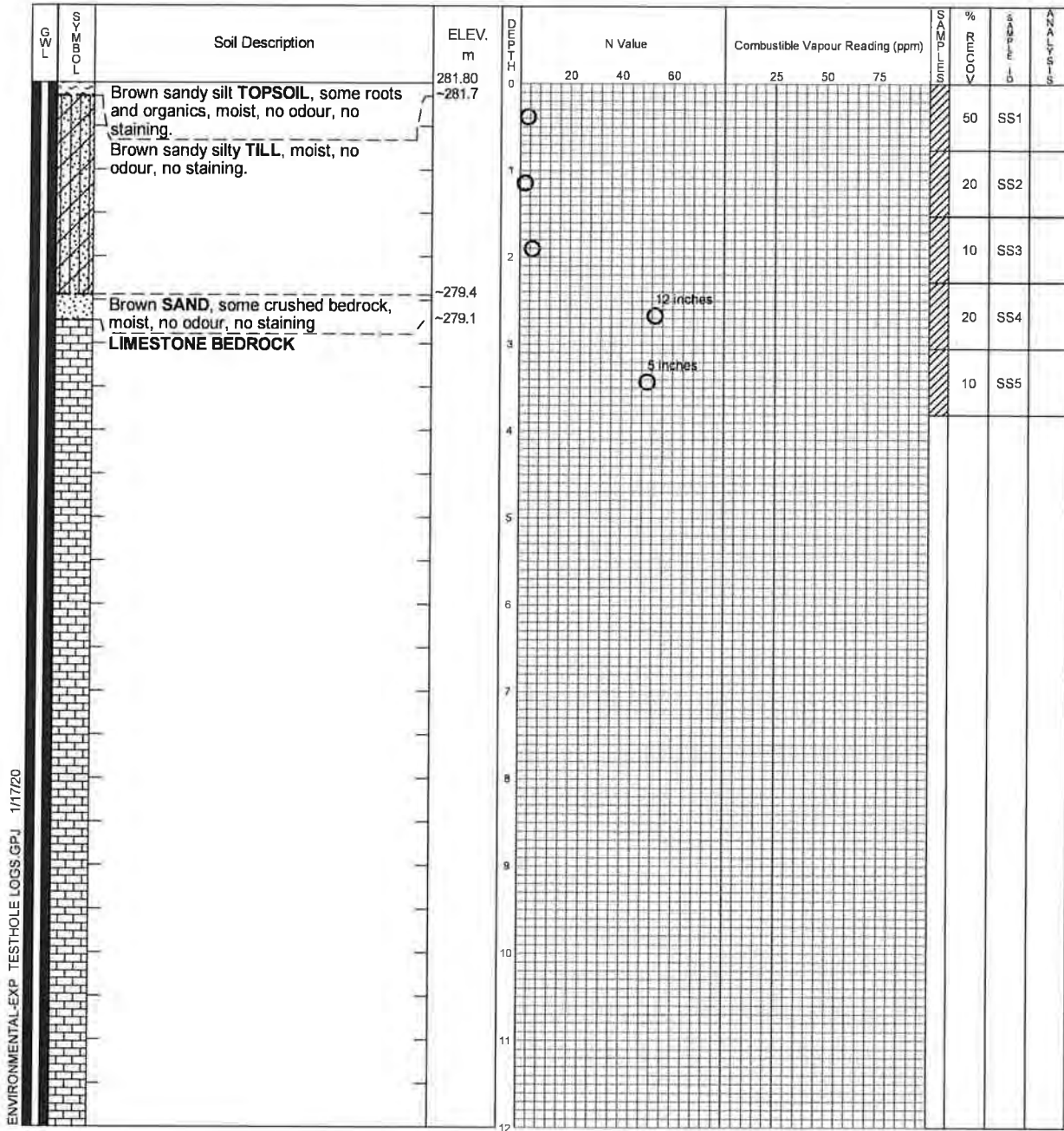
Date Drilled: October 23-24, 2019

Chemical Analysis

Drill Type: CME-75 Track Mount

Datum: _____

BTEX Benzene, Toluene, Ethylbenzene and Xylenes * Duplicate Sample
 ING Metals and Inorganics PCB Polychlorinated Biphenyls
 MET Metals PHC Petroleum Hydrocarbons (F1-F4)
 PAH Polycyclic Aromatic Hydrocarbons VOC Volatile Organic Compounds
 PEST Organochlorine Pesticides



Continued Next Page



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Time	Water Level (m)	Depth to Cave (m)

Log of Borehole TH203

Project No. MRK-00256269-A0

Drawing No. 4

Project: City of Kawartha Landfill Sites

Sheet No. 2 of 2

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH m	N Value			Combustible Vapour Reading (ppm)			SAMP SIZE	% CO ₂	SPE ID	ANAL YSIS
					20	40	60	25	50	75				
			269.80	12										
				13										
				14										
				15										
				16										
			-265.5	17										
				18										
				19										
				20										
				21										
				22										
				23										
				24										
				25										
				26										

End of Test hole at 16.3 mbgs.

ENVIRONMENTAL-EXP TESTHOLE LOGS.GPJ 1/17/20



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Time	Water Level (m)	Depth to Cave (m)

ROCK CORE LOG

BH TH 203

PROJECT City of Kawartha, RFQ	ORIENTATION Vertical	ELEVATION (m) 281.8	DATUM Geodetic	PROJECT NUMBER MRK00256269-A0
LOCATION Sommerville Landfill, Kawartha Lakes, Ontario	DATE STARTED 10/23/19	COMPLETED 10/24/19	LOGGED BY AM	DRAWING NUMBER 4A
CLIENT City of Kawartha Lakes	DRILLER Pontil	DRILL TYPE CME 75 Track	CORE BARREL HQ	SHEET 1 of 2

ELEVATION (m)	DEPTH (m)	SYMBOL	GENERAL DESCRIPTION	JOINT CHARACTERISTICS							WEATHERING	STRENGTH	FRACTURE FREQUENCY	RUN NUMBER	RECOVERY (%)	RQD	WATER RECOVERY (%)	WATER COLOUR			
				NO. OF SETS	JOINT TYPE	ORIENTATION	SPACING	ROUGHNESS	FILLING	APERTURE (mm)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
274.6	8		BOBCAYGEON FORMATION Fossiliferous Limestone Brown to grey-brown crinoidal limestone with calcarenites and nodular texture. Generally unweathered, becomes increasingly laminated a 2-3 meters depth from bedrock surface, moderate strength. Discontinuities: Poor recovery in RUN 1 possibly due weak material being washed away at the bedrock-till interface. bedding joints are rough undulating, flat and at wide to very close intervals; rough undulating vertical joint at 10.34 m depth.	1	B	F	C C	RU	T	0					1	40	0	N/A	Beige		
				1	B	F	C W	RU	T	0						2	100	78	N/A	Beige	
	9																				
	10			1 1	B C	F V	C	RU RU	T T	0 0				3	100	58	N/A	Beige			
	11																				
	12			1	B	F	C W	RU	T	0				4	100	51	N/A	Beige			

ROCK CORE LOG

BH TH 203

PROJECT City of Kawartha, RFQ	ORIENTATION Vertical	ELEVATION (m) 281.8	DATUM Geodetic	PROJECT NUMBER MRK00256269-A0
LOCATION Sommerville Landfill, Kawartha Lakes, Ontario	DATE STARTED 10/23/19	COMPLETED 10/24/19	LOGGED BY AM	DRAWING NUMBER 4A
CLIENT City of Karartha Lakes	DRILLER Pontil	DRILL TYPE CME 75 Track	CORE BARREL HQ	SHEET 2 of 2

ELEVATION (m)	DEPTH (m)	SYMBOL	GENERAL DESCRIPTION	JOINT CHARACTERISTICS								WEATHERING	STRENGTH	FRACTURE FREQUENCY	RUN NUMBER	RECOVERY (%)	RQD	WATER RECOVERY (%)	WATER COLOUR
				NO. OF SETS	JOINT TYPE	ORIENTATION	SPACING	ROUGHNESS	FILLING	APERTURE (mm)									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
265.9	13			1	B	F	C W	RU	T	0					5	100	91	N/A	Beige
	1			B	F	W	RU	T	0				6		100	84	N/A	Beige	
	1			B	F	C	SP RU	T	0				7		100	80	N/A	Beige	
	16			End of Borehole at 15.9 m															
	17																		

EXP_ROCKCORE_KAWARTHA_LAKES ROCK CORE LOGS.GPJ CORE LOG.GDT 1/16/20

Log of Borehole TH204

Project No. MRK-00256269-A0

Drawing No. 5

Project: City of Kawartha Landfill Sites

Sheet No. 1 of 2

Location: Various Landfill Sites, Kawartha Lakes

Somerville Landfill

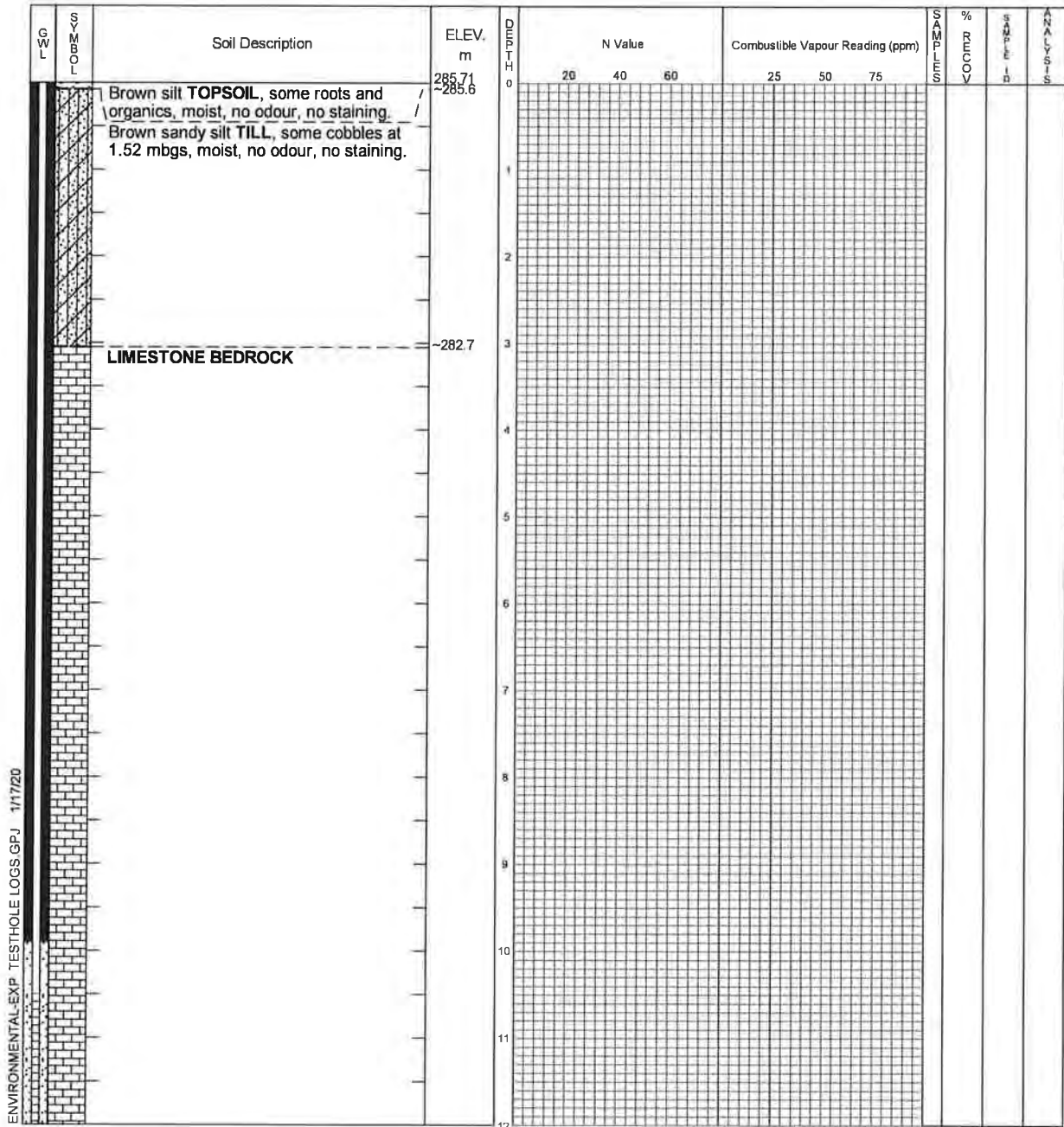
Date Drilled: October 18 and 21, 2019

Drill Type: CME-75 Track Mount

Datum: _____

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		



Continued Next Page



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Time	Water Level (m)	Depth to Cave (m)

Log of Borehole TH204

Project No. MRK-00256269-A0

Drawing No. 5

Project: City of Kawartha Landfill Sites

Sheet No. 2 of 2

GWL	SYMBOL	Soil Description	ELEV m	DEPTH m	N Value			Combustible Vapour Reading (ppm)			SAMPLES	%COMBUSTIBLE	SAMPLE ID	ANALYSIS
					20	40	60	25	50	75				
			273.71	12										
				13										
			~272.1	14										
				15										
				16										
				17										
				18										
				19										
				20										
				21										
				22										
				23										
				24										
				25										
				26										

End of Test hole at 13.6 mbgs.

ENVIRONMENTAL-EXP TESTHOLE LOGS GPJ 1/17/20



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Time	Water Level (m)	Depth to Cave (m)

ROCK CORE LOG

BH TH 204

PROJECT City of Kawartha, RFQ	ORIENTATION Vertical	ELEVATION (m) 285.7	DATUM Geodetic	PROJECT NUMBER MRK00256269-A0
LOCATION Sommerville Landfill, Kawartha Lakes, Ontario	DATE STARTED 10/18/19	COMPLETED 10/21/19	LOGGED BY AM	DRAWING NUMBER 5A
CLIENT City of Karartha Lakes	DRILLER Pontil	DRILL TYPE CME 75 Track	CORE BARREL HQ	SHEET 1 of 2

ELEVATION (m)	DEPTH (m)	SYMBOL	GENERAL DESCRIPTION	JOINT CHARACTERISTICS								WEATHERING	STRENGTH	FRACTURE FREQUENCY	RUN NUMBER	RECOVERY (%)	RQD	WATER RECOVERY (%)	WATER COLOUR
				NO. OF SETS	JOINT TYPE	ORIENTATION	SPACING	ROUGHNESS	FILLING	APERTURE (mm)									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
282.2			BOBCAYGEON FORMATION Fossiliferous Limestone Brown to grey-brown crinoidal limestone with calcarenites and nodular texture. Generally unweathered, becomes increasingly laminated a 2-3 meters depth from bedrock surface, moderate strength. Discontinuities: bedding joints are rough undulating, flat and at wide to very close intervals; rough undulating vertical joints at 4.47 m depth.																
	4			1 1	B C	F F	C	RU RU	T T	0 0				1	100	80	N/A	Beige	
	5			1	B	F	C	RU	T	0				2	100	56	N/A	Beige	
	6																		
	7			1	B	F	C	RU	T	0				3	100	50	N/A	Beige	
	8			1	B	F	W	RU	T	0									

ROCK CORE LOG

BH TH 204

PROJECT City of Kawartha, RFQ	ORIENTATION Vertical	ELEVATION (m) 285.7	DATUM Geodetic	PROJECT NUMBER MRK00256269-A0
LOCATION Sommerville Landfill, Kawartha Lakes, Ontario	DATE STARTED 10/18/19	COMPLETED 10/21/19	LOGGED BY AM	DRAWING NUMBER 5A
CLIENT City of Karartha Lakes	DRILLER Pontil	DRILL TYPE CME 75 Track	CORE BARREL HQ	SHEET 2 of 2

ELEVATION (m)	DEPTH (m)	SYMBOL	GENERAL DESCRIPTION	JOINT CHARACTERISTICS								WEATHERING	STRENGTH	FRACTURE FREQUENCY	RUN NUMBER	RECOVERY (%)	RQD	WATER RECOVERY (%)	WATER COLOUR
				NO. OF SETS	JOINT TYPE	ORIENTATION	SPACING	ROUGHNESS	FILLING	APERTURE (mm)									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
272.8	9						C							4	100	71	N/A	Beige	
	5						100							100	N/A	Beige			
	6						100							56	N/A	Beige			
	7						100							100	N/A	Beige			
13			End of Borehole at 12.9 m																

EXP_ROCKCORE_KAWARTHA LAKES ROCK CORE LOGS.GPJ CORE LOG.GDT 1/16/20



APPENDIX C

Ground Water Elevations Tables

Somerville Landfill

Ground Water Elevations

Monitor No.	Ground Elevation (mASL)	Total Depth (mbgl)	Top of Pipe Elevation (mASL)	Ground Water Elevations (masl)										
				21-Oct-10	11-May-11	12-Sep-11	29-May-12	21-May-13	30-Sep-13	28-Apr-14	22-Sep-14	16-Jun-15	21-Mar-16	01-Jun-16
1-I	295.15	12.71	296.10	286.11	287.59	286.14	286.68	287.69	285.80	289.55	286.28	286.22		288.05
1-II	295.28	9.10	295.88	286.18	288.24	286.51	287.10	288.17	286.28	289.30	286.20	286.66		288.61
2-II	296.24	11.38	297.08	288.50	288.66	288.39	288.64	288.97	288.32	289.84	288.78	288.38		289.67
5-I	293.11	17.22	293.93	277.93	278.77	277.30	279.86	277.88	277.31	280.59	277.01	277.53	279.16	277.43
7	280.64	4.23	281.39	278.22	280.33	276.92		278.44	277.11		276.78	277.64		277.26
8-I	291.67	13.38	292.44	278.29	280.16	278.29	278.22	278.44	278.17	281.69	278.09	278.24	280.93	278.24
8-III	291.55	16.83	292.27	277.77	280.12	276.66	277.12	277.52	276.98	281.67	276.33	277.29	281.03	277.09
9	278.98	3.97	279.98	278.11		277.94	277.63	278.82	277.08		276.67	277.56		277.17
10-II	299.72	16.16	300.27	286.17	286.83	285.88	286.82	287.34	286.31	288.77	286.55	286.09		287.12
11	289.65	12.49	290.47	279.62	281.05	278.17	278.53	279.23	278.35	282.77	278.32	278.00	282.09	277.73
12	283.66	8.33	284.37	277.33	274.59	276.61	276.81	277.73	276.66	281.18	276.06	276.97		276.82
13	282.28	9.63	283.02	278.27	278.74	277.37	277.67	278.10	277.45	278.99	277.20	277.76		277.55
14	290.25	18.20	291.06	278.59	280.24	277.41	277.72	278.56	277.47	281.89	277.24	277.92	281.24	277.68
15	283.12	8.80	283.98	278.56	280.35	277.58	277.67	278.52	277.52	281.86	277.00	277.90	281.30	277.59
16-I	297.50	22.26	298.33											
16-II	297.57	20.00	298.45											
16-III	297.62	15.25	298.48											
17	302.14	10.67	303.21											
201	295.43	16.20	296.27											
201D	295.53	25.30	296.41											
202	283.61	16.30	284.50											
203	281.80	16.30	282.82											
204	285.71	13.60	286.62											

NM -Not Measured

Somerville Landfill

Ground Water Elevations

Monitor No.	Ground Elevation (mASL)	Total Depth (mbgl)	Top of Pipe Elevation (mASL)	Ground Water Elevations (masl)								
				22-Aug-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20
1-I	295.15	12.71	296.10	286.25	285.63	287.45	286.47	288.44	285.87	289.69	286.04	289.15
1-II	295.28	9.10	295.88	286.69	286.28	287.52	286.75	289.12	286.33	291.42	286.41	289.38
2-II	296.24	11.38	297.08	288.84	288.31	289.42	288.31	289.07	288.33	288.86	288.46	289.84
5-I	293.11	17.22	293.93	276.92	276.56	278.88	277.09	279.74	276.43	279.74	276.90	278.56
7	280.64	4.23	281.39	276.56	276.46	281.29	276.87	281.05	276.43	Inaccessible	276.59	280.75
8-I	291.67	13.38	292.44	278.07	278.17	281.09	278.21	280.84	278.19	281.17	278.74	280.60
8-III	291.55	16.83	292.27	276.37	275.77	281.03	276.73	280.80	275.69	281.11	276.37	280.54
9	278.98	3.97	279.98	276.46	275.81	Inaccessible	276.79	Inaccessible	275.71	Inaccessible	276.44	
10-II	299.72	16.16	300.27	286.55	286.23	287.94	286.67	287.19	286.32	286.27	286.34	288.58
11	289.65	12.49	290.47	277.05	277.07	282.17	277.67	282.24	276.92	282.27	278.02	281.52
12	283.66	8.33	284.37	276.14	275.71		276.45		275.53	280.54	276.12	280.03
13	282.28	9.63	283.02		276.65	278.76	274.49	279.21	276.50	279.18	277.06	278.60
14	290.25	18.20	291.06	276.03	276.49	281.22	277.24	281.42	276.28	281.68	277.06	280.67
15	283.12	8.80	283.98	276.78	276.18	281.34	277.03	281.18	276.18	281.46	276.40	280.79
16-I	297.50	22.26	298.33		276.56	279.85	276.59	281.33	276.37	281.45	277.05	279.48
16-II	297.57	20.00	298.45		277.72	279.87	277.57	281.30	277.73	281.45	277.73	278.48
16-III	297.62	15.25	298.48		286.23	286.57	286.78	286.41	286.20	285.38	286.21	287.51
17	302.14	10.67	303.21		294.60	295.01	293.57	293.66	293.57	293.98	291.61	293.20
201	295.43	16.20	296.27								279.18	279.24
201D	295.53	25.30	296.41								276.98	-
202	283.61	16.30	284.50								276.60	277.80
203	281.80	16.30	282.82								276.15	277.60
204	285.71	13.60	286.62								277.75	280.81

NM -Not Measured

Somerville Landfill

Ground Water Elevations

Monitor No.	Ground Elevation (mASL)	Total Depth (mbgl)	Top of Pipe Elevation (mASL)	Ground Water Elevations (masl)			
				16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25
1-I	295.15	12.71	296.10	286.04	286.00	288.84	285.95
1-II	295.28	9.10	295.88	Dry	285.91	288.91	286.44
2-II	296.24	11.38	297.08	288.71	288.69	289.45	288.41
5-I	293.11	17.22	293.93	279.03	Dry	279.06	Dry
7	280.64	4.23	281.39	280.74	276.47	Inaccessible	276.44
8-I	291.67	13.38	292.44	280.47	278.26	280.95	277.68
8-III	291.55	16.83	292.27	280.41	275.99	280.89	275.29
9	278.98	3.97	279.98	Inaccessible	Destroyed	Destroyed	Destroyed
10-II	299.72	16.16	300.27	286.87	286.57	288.72	286.24
11	289.65	12.49	290.47	281.02	276.81	281.34	Dry
12	283.66	8.33	284.37	279.95	275.76	280.34	276.29
13	282.28	9.63	283.02	279.02	276.71	278.93	276.15
14	290.25	18.20	291.06	280.88	276.54	281.24	275.98
15	283.12	8.80	283.98	280.85	276.79	281.22	275.97
16-I	297.50	22.26	298.33	279.97	276.67	280.38	276.11
16-II	297.57	20.00	298.45	279.78	277.75	279.96	Dry
16-III	297.62	15.25	298.48	285.85	286.28	286.98	286.26
17	302.14	10.67	303.21	292.19	292.01	291.87	291.87
201	295.43	16.20	296.27	278.62	Dry	279.80	Dry
201D	295.53	25.30	296.41	279.46	276.64	Obstructed	276.09
202	283.61	16.30	284.50	277.70	276.74	277.95	276.12
203	281.80	16.30	282.82	277.39	276.78	277.87	276.59
204	285.71	13.60	286.62	281.06	276.51	281.39	275.90

NM -Not Measured



APPENDIX D

Laboratory Certificates

C.O.C.: -

REPORT No: 25-010879 - Rev. 0

Report To:

City of Kawartha Lakes
 PO Box 9000
 322 Kent Street West
 Lindsay, ON K9V 4T7

CADUCEON Environmental Laboratories

285 Dalton Ave
 Kingston, ON K7K 6Z1

Attention: Bonnie Ferguson

DATE RECEIVED: 2025-Apr-24
 DATE REPORTED: 2025-May-16
 SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: Somerville Landfill
 P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	21	OTTAWA	PCURIEL	2025-Apr-29	A-IC-01	SM 4110B
BOD5 (Liquid)	21	KINGSTON	DCASSIDY	2025-Apr-30	BOD-001	SM 5210B
COD (Liquid)	21	KINGSTON	MWILSON	2025-May-07	COD-001	SM 5220D
Colour (Liquid)	21	OTTAWA	STAILLON	2025-Apr-29	A-COL-01	SM 2120C
Cond/pH/Alk Auto (Liquid)	21	OTTAWA	SBOUDREAU	2025-Apr-28	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
Cyanide WAD (Liquid)	21	KINGSTON	EHINCH	2025-Apr-28	CN-001	SM 4500-CN-E
DOC (Liquid)	21	OTTAWA	SLOZO	2025-May-09	C-OC-01	EPA 415.2
Ion Balance (Calc.)	21	OTTAWA	ASCHNEIDER		CP-028	MECP E3196
Chromium VI (Liquid)	21	OTTAWA	STAILLON	2025-Apr-30	D-CRVI-01	MECP E3056
ICP/MS (Liquid)	21	OTTAWA	TPRICE	2025-Apr-30	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	21	OTTAWA	SGORMAN	2025-Apr-29	D-ICP-01	SM 3120B
Mercury (Liquid)	21	OTTAWA	TBENNETT	2025-Apr-30	D-HG-02	SM 3112B
Ammonia & o-Phosphate (Liquid)	21	KINGSTON	VHAMMOND	2025-May-05	NH3-001	SM 4500NH3
Phenols (Liquid)	21	KINGSTON	EHINCH	2025-May-02	PHEN-01	MECP E3179
TP & TKN (Liquid)	21	KINGSTON	YLIEN	2025-May-07	TPTKN-001	MECP E3516.2
TSS (Liquid)	21	KINGSTON	MCLOSS	2025-Apr-30	TSS-001	SM 2540D
Turbidity (Liquid)	21	OTTAWA	MMIRELLA	2025-Apr-29	A-TURB-01	SM 2130B

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *



Michelle Dubien
Data Specialist

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Client I.D.			MW1-I	MW1-II	MW2-II	MW5-I	MW8-I
Sample I.D.			25-010879-1	25-010879-2	25-010879-3	25-010879-4	25-010879-5
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	631	616	383	198	503
TDS (Calc. from Cond.)	mg/L	3	606	597	531	215	504
Conductivity @25°C	uS/cm	1	1130	1110	996	416	948
pH @25°C	pH units	-	7.13	7.05	7.49	7.50	7.25
Colour	TCU	2	<2	6	<2	4	<2
Turbidity	NTU	0.1	2040	104	135	27.8	97.5
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	mg/L	0.5	0.7	2.2	83.3	4.0	6.5
Nitrate (N)	mg/L	0.05	<0.05	<0.05	<0.05	0.20	<0.05
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	4	2	34	12	7
BOD5	mg/L	3	<3	14	<3	<3	<3
Total Suspended Solids	mg/L	3	4700	158	815	46	102
Phosphorus (Total)	mg/L	0.01	2.40	0.24	0.28	0.09	0.05
Total Kjeldahl Nitrogen	mg/L	0.1	0.4	12.1	0.8	0.5	0.5
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.07	4.81	0.08	<0.05	0.08
Ammonia (N)-unionized	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Organic Carbon	mg/L	0.8	4.0	29.7	9.8	4.6	4.3
Cyanide (WAD)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenolics	mg/L	0.001	<0.001	0.003	0.002	<0.001	<0.001
COD	mg/L	5	117	219	48	19	13



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Client I.D.			MW1-I	MW1-II	MW2-II	MW5-I	MW8-I
Sample I.D.			25-010879-1	25-010879-2	25-010879-3	25-010879-4	25-010879-5
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Hardness (as CaCO3)	mg/L	0.02	673	594	506	226	558
Aluminum	mg/L	0.01	0.08	0.09	0.07	0.05	0.08
Barium	mg/L	0.001	0.228	0.219	0.249	0.043	0.184
Boron	mg/L	0.005	0.014	0.050	0.461	0.043	0.023
Calcium	mg/L	0.02	247	222	163	84.9	197
Iron	mg/L	0.005	8.22	16.8	0.105	0.165	6.71
Magnesium	mg/L	0.02	13.6	9.39	23.9	3.26	15.9
Manganese	mg/L	0.001	2.53	1.89	0.069	0.024	0.900
Phosphorus	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1	2.9	4.3	3.2	0.5	1.9
Sodium	mg/L	0.2	2.1	3.3	13.6	2.8	3.3
Strontium	mg/L	0.001	0.505	0.468	0.376	0.150	0.380
Tin	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.005	<0.005	0.005	<0.005	<0.005	<0.005
Antimony	mg/L	0.0001	<0.0001	0.0002	<0.0001	0.0001	0.0001
Arsenic	mg/L	0.0001	0.0004	0.0011	0.0004	0.0001	0.0005
Beryllium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	<0.000015	<0.000015	0.000016	<0.000015	<0.000015
Chromium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001	0.0082	0.0102	0.0045	0.0003	0.0052



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Client I.D.			MW1-I	MW1-II	MW2-II	MW5-I	MW8-I
Sample I.D.			25-010879-1	25-010879-2	25-010879-3	25-010879-4	25-010879-5
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Copper	mg/L	0.0001	0.0005	0.0008	0.0009	0.0007	0.0001
Lead	mg/L	0.00002	0.00008	0.00016	0.00005	0.00020	0.00004
Molybdenum	mg/L	0.0001	0.0005	0.0002	0.0004	0.0001	0.0001
Nickel	mg/L	0.0002	0.0037	0.0053	0.0049	0.0007	0.0041
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.00029	0.00017	0.00184	0.00013	0.00016
Vanadium	mg/L	0.0001	0.0002	0.0001	0.0009	0.0001	<0.0001
Chromium (VI)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	12.7	12.4	10.7	4.32	10.4
Cation Sum	meq/L	-	14.2	13.1	10.8	4.65	11.7
% Difference	%	-	5.34	2.61	0.364	3.70	6.09
Ion Ratio	-	-	0.899	0.949	0.993	0.929	0.885
Sodium Adsorption Ratio	-	-	0.0346	0.0591	0.263	0.0823	0.0610
TDS (Ion Sum Calc)	mg/L	1	660	632	551	227	541
TDS(calc.)/EC(actual)	-	-	0.585	0.569	0.553	0.545	0.571
Conductivity Calc	µmho/cm	-	1120	1040	998	425	945
Conductivity Calc / Conductivity	-	-	0.990	0.935	1.00	1.02	0.997
Langelier Index(25°C)	-	-	0.850	0.714	0.813	0.292	0.774



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			Client I.D.	MW1-I	MW1-II	MW2-II	MW5-I	MW8-I
			Sample I.D.	25-010879-1	25-010879-2	25-010879-3	25-010879-4	25-010879-5
			Date Collected	2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.		-	-	-	-	-
Saturation pH (25°C)	-	-		6.28	6.34	6.68	7.21	6.48
pH (Client Data)	pH units	-		6.04	6.20	6.66	6.83	6.45
Temperature (Client Data)	°C	-		7.2	6.9	7.5	6.9	6.9



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Client I.D.			MW8-III	MW10-II	MW11	MW12	MW13
Sample I.D.			25-010879-6	25-010879-7	25-010879-8	25-010879-9	25-010879-10
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	257	280	202	168	161
TDS (Calc. from Cond.)	mg/L	3	263	314	217	163	172
Conductivity @25°C	uS/cm	1	509	606	421	317	335
pH @25°C	pH units	-	7.65	7.79	7.50	7.51	7.58
Colour	TCU	2	2	<2	14	<2	6
Turbidity	NTU	0.1	12.9	38.1	29.2	9.1	37.5
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	mg/L	0.5	2.3	10.7	7.9	1.5	6.5
Nitrate (N)	mg/L	0.05	<0.05	2.41	0.58	<0.05	0.07
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	5	19	5	4	3
BOD5	mg/L	3	<3	<3	<3	4	<3
Total Suspended Solids	mg/L	3	18	138	56	22	47
Phosphorus (Total)	mg/L	0.01	0.03	0.07	0.05	0.04	0.07
Total Kjeldahl Nitrogen	mg/L	0.1	0.4	0.4	0.6	0.3	0.3
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.18	<0.05	0.06	<0.05	<0.05
Ammonia (N)-unionized	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Organic Carbon	mg/L	0.8	2.9	1.7	6.5	4.1	4.7
Cyanide (WAD)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
COD	mg/L	5	11	18	18	12	15



Michelle Dubien
Data Specialist

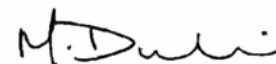
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			Client I.D.	MW8-III	MW10-II	MW11	MW12	MW13
			Sample I.D.	25-010879-6	25-010879-7	25-010879-8	25-010879-9	25-010879-10
			Date Collected	2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.		-	-	-	-	-
Hardness (as CaCO3)	mg/L	0.02		284	306	224	176	185
Aluminum	mg/L	0.01		0.05	0.04	0.04	0.04	0.04
Barium	mg/L	0.001		0.056	0.131	0.137	0.018	0.025
Boron	mg/L	0.005		0.020	0.088	0.022	<0.005	0.005
Calcium	mg/L	0.02		106	87.0	83.8	68.0	70.7
Iron	mg/L	0.005		0.949	0.006	0.297	0.007	0.014
Magnesium	mg/L	0.02		4.52	21.6	3.42	1.51	1.95
Manganese	mg/L	0.001		0.195	<0.001	0.205	<0.001	0.002
Phosphorus	mg/L	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1		0.8	4.0	2.9	0.1	0.3
Sodium	mg/L	0.2		1.6	9.5	3.2	0.7	1.7
Strontium	mg/L	0.001		0.186	0.255	0.190	0.097	0.122
Tin	mg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005		<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.005		<0.005	<0.005	<0.005	0.005	0.005
Antimony	mg/L	0.0001		<0.0001	0.0002	0.0002	<0.0001	<0.0001
Arsenic	mg/L	0.0001		0.0004	0.0001	0.0003	<0.0001	0.0001
Beryllium	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015		<0.000015	<0.000015	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001		0.0009	0.0001	0.0018	0.0001	<0.0001



**Michelle Dubien
Data Specialist**

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Client I.D.			MW8-III	MW10-II	MW11	MW12	MW13
Sample I.D.			25-010879-6	25-010879-7	25-010879-8	25-010879-9	25-010879-10
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Copper	mg/L	0.0001	0.0003	0.0003	0.0093	0.0008	0.0003
Lead	mg/L	0.00002	0.00010	0.00004	0.00014	0.00004	0.00006
Molybdenum	mg/L	0.0001	0.0002	0.0011	0.0009	<0.0001	0.0001
Nickel	mg/L	0.0002	0.0008	0.0008	0.0039	0.0008	0.0009
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.00010	0.00410	0.00036	0.00005	0.00006
Vanadium	mg/L	0.0001	<0.0001	0.0013	0.0003	<0.0001	<0.0001
Chromium (VI)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	5.31	6.47	4.40	3.48	3.46
Cation Sum	meq/L	-	5.81	6.64	4.70	3.55	3.77
% Difference	%	-	4.49	1.30	3.38	0.972	4.33
Ion Ratio	-	-	0.914	0.974	0.935	0.981	0.917
Sodium Adsorption Ratio	-	-	0.0411	0.236	0.0926	0.0215	0.0535
TDS (Ion Sum Calc)	mg/L	1	276	331	230	177	181
TDS(calc.)/EC(actual)	-	-	0.542	0.546	0.547	0.557	0.540
Conductivity Calc	µmho/cm	-	512	603	432	334	348
Conductivity Calc / Conductivity	-	-	1.01	0.995	1.02	1.05	1.04
Langelier Index(25°C)	-	-	0.643	0.735	0.295	0.155	0.222



**Michelle Dubien
Data Specialist**

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			Client I.D.	MW8-III	MW10-II	MW11	MW12	MW13
			Sample I.D.	25-010879-6	25-010879-7	25-010879-8	25-010879-9	25-010879-10
			Date Collected	2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.		-	-	-	-	-
Saturation pH (25°C)	-	-		7.01	7.06	7.20	7.35	7.36
pH (Client Data)	pH units	-		6.84	7.22	7.01	7.24	7.36
Temperature (Client Data)	°C	-		6.9	8.0	7.8	6.0	5.7



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Client I.D.			MW14	MW15	MW16-I	MW16-II	MW16-III
Sample I.D.			25-010879-11	25-010879-12	25-010879-13	25-010879-14	25-010879-15
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	242	240	175	174	216
TDS (Calc. from Cond.)	mg/L	3	279	252	182	183	233
Conductivity @25°C	uS/cm	1	538	488	353	355	451
pH @25°C	pH units	-	7.55	7.68	7.44	7.52	7.83
Colour	TCU	2	2	<2	4	4	<2
Turbidity	NTU	0.1	1100	8.4	17.5	25.5	1510
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	mg/L	0.5	21.0	3.8	2.5	2.5	8.3
Nitrate (N)	mg/L	0.05	0.22	0.13	0.06	0.06	0.36
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	7	10	4	4	8
BOD5	mg/L	3	<3	<3	<3	<3	<3
Total Suspended Solids	mg/L	3	420	8	49	47	19700
Phosphorus (Total)	mg/L	0.01	0.63	0.02	0.04	0.04	6.56
Total Kjeldahl Nitrogen	mg/L	0.1	1.3	0.2	0.3	0.3	1.4
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	<0.05	<0.05	<0.05	0.07	0.19
Ammonia (N)-unionized	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Organic Carbon	mg/L	0.8	3.6	2.2	4.3	4.3	1.6
Cyanide (WAD)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
COD	mg/L	5	45	<5	26	10	79



Michelle Dubien
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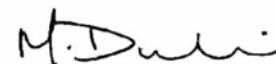
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Client I.D.			MW14	MW15	MW16-I	MW16-II	MW16-III
Sample I.D.			25-010879-11	25-010879-12	25-010879-13	25-010879-14	25-010879-15
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Hardness (as CaCO3)	mg/L	0.02	274	263	194	191	247
Aluminum	mg/L	0.01	0.05	0.05	0.03	0.03	0.14
Barium	mg/L	0.001	0.117	0.047	0.032	0.035	0.085
Boron	mg/L	0.005	0.013	0.010	0.005	0.005	<0.005
Calcium	mg/L	0.02	104	102	73.1	72.9	77.8
Iron	mg/L	0.005	0.196	<0.005	0.028	<0.005	0.160
Magnesium	mg/L	0.02	3.51	2.05	2.67	2.21	12.8
Manganese	mg/L	0.001	0.003	<0.001	0.001	<0.001	0.008
Phosphorus	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1	0.6	0.4	0.3	0.2	1.8
Sodium	mg/L	0.2	6.2	0.9	1.4	1.1	4.6
Strontium	mg/L	0.001	0.174	0.191	0.120	0.118	0.174
Tin	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	0.008
Zinc	mg/L	0.005	0.005	<0.005	<0.005	<0.005	<0.005
Antimony	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Arsenic	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	0.0001
Beryllium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.002
Cobalt	mg/L	0.0001	0.0003	0.0001	0.0001	<0.0001	0.0003



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Client I.D.			MW14	MW15	MW16-I	MW16-II	MW16-III
Sample I.D.			25-010879-11	25-010879-12	25-010879-13	25-010879-14	25-010879-15
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Copper	mg/L	0.0001	0.0008	0.0002	0.0003	0.0004	0.0009
Lead	mg/L	0.00002	0.00017	0.00004	0.00006	0.00003	0.00014
Molybdenum	mg/L	0.0001	0.0003	<0.0001	0.0002	0.0001	0.0003
Nickel	mg/L	0.0002	0.0010	0.0009	0.0008	0.0007	0.0008
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.00018	0.00008	0.00033	0.00010	0.00076
Vanadium	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	0.0025
Chromium (VI)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	5.58	5.11	3.65	3.64	4.74
Cation Sum	meq/L	-	5.78	5.31	3.94	3.88	5.20
% Difference	%	-	1.73	1.96	3.86	3.14	4.62
Ion Ratio	-	-	0.966	0.961	0.926	0.939	0.912
Sodium Adsorption Ratio	-	-	0.163	0.0238	0.0453	0.0359	0.128
TDS (Ion Sum Calc)	mg/L	1	289	263	189	188	244
TDS(calc.)/EC(actual)	-	-	0.537	0.539	0.536	0.529	0.542
Conductivity Calc	µmho/cm	-	539	487	360	357	465
Conductivity Calc / Conductivity	-	-	1.00	0.997	1.02	1.01	1.03
Langelier Index(25°C)	-	-	0.507	0.635	0.123	0.202	0.623



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			Client I.D.	MW14	MW15	MW16-I	MW16-II	MW16-III
			Sample I.D.	25-010879-11	25-010879-12	25-010879-13	25-010879-14	25-010879-15
			Date Collected	2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.		-	-	-	-	-
Saturation pH (25°C)	-	-		7.04	7.04	7.32	7.32	7.21
pH (Client Data)	pH units	-		6.78	6.54	6.95	7.03	7.02
Temperature (Client Data)	°C	-		8.1	6.3	7.8	7.1	7.2



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Client I.D.			MW17	MW202	MW203	MW204	DUP
Sample I.D.			25-010879-16	25-010879-17	25-010879-18	25-010879-19	25-010879-20
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	2480	211	138	187	239
TDS (Calc. from Cond.)	mg/L	3	2830	278	2540	793	250
Conductivity @25°C	uS/cm	1	5000	536	4510	1460	484
pH @25°C	pH units	-	7.01	7.75	7.74	7.81	7.81
Colour	TCU	2	98	<2	<2	<2	<2
Turbidity	NTU	0.1	965	104	15.0	45.4	7.0
Fluoride	mg/L	0.1	<0.7	0.3	<0.7	0.2	<0.1
Chloride	mg/L	0.5	326	15.6	816	124	4.0
Nitrate (N)	mg/L	0.05	<0.40	0.17	<0.40	0.46	0.12
Nitrite (N)	mg/L	0.05	<0.40	<0.05	<0.40	<0.05	<0.05
Sulphate	mg/L	1	27	42	1230	410	9
BOD5	mg/L	3	14	4	<3	<3	<3
Total Suspended Solids	mg/L	3	2000	175	28	56	4
Phosphorus (Total)	mg/L	0.01	1.01	0.06	0.02	0.05	0.02
Total Kjeldahl Nitrogen	mg/L	0.1	232	0.4	2.1	0.4	0.2
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	197	0.28	2.44	0.14	<0.05
Ammonia (N)-unionized	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Organic Carbon	mg/L	0.8	18.0	4.4	<0.8	1.7	2.5
Cyanide (WAD)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenolics	mg/L	0.001	0.016	0.002	<0.001	<0.001	<0.001
COD	mg/L	5	533	8	41	17	<5



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Data Specialist

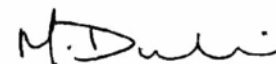
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Client I.D.			MW17	MW202	MW203	MW204	DUP
Sample I.D.			25-010879-16	25-010879-17	25-010879-18	25-010879-19	25-010879-20
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Hardness (as CaCO3)	mg/L	0.02	1500	264	904	581	263
Aluminum	mg/L	0.01	0.16	0.02	0.05	0.04	0.05
Barium	mg/L	0.001	0.684	0.018	0.016	0.034	0.047
Boron	mg/L	0.005	9.21	0.393	4.00	1.13	0.011
Calcium	mg/L	0.02	481	79.4	179	167	102
Iron	mg/L	0.005	32.3	0.220	0.235	0.011	0.008
Magnesium	mg/L	0.02	72.4	16.0	111	39.9	2.05
Manganese	mg/L	0.001	1.74	0.002	0.019	0.002	<0.001
Phosphorus	mg/L	0.1	0.2	<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1	146	3.1	14.6	5.6	0.4
Sodium	mg/L	0.2	341	11.3	627	79.1	0.9
Strontium	mg/L	0.001	2.51	5.32	9.62	3.29	0.191
Tin	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005	0.012	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.005	0.005	<0.005	0.005	0.005	<0.005
Antimony	mg/L	0.0001	0.0005	<0.0001	0.0002	0.0001	<0.0001
Arsenic	mg/L	0.0001	0.0020	0.0001	0.0015	0.0006	<0.0001
Beryllium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	<0.000030	<0.000015	<0.000030	<0.000015	<0.000015
Chromium	mg/L	0.001	0.006	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001	0.0069	<0.0001	0.0003	0.0002	0.0001



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Client I.D.			MW17	MW202	MW203	MW204	DUP
Sample I.D.			25-010879-16	25-010879-17	25-010879-18	25-010879-19	25-010879-20
Date Collected			2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-	-	-
Copper	mg/L	0.0001	<0.0002	0.0004	<0.0002	0.0005	0.0002
Lead	mg/L	0.00002	<0.00009	0.00003	<0.00009	0.00005	0.00004
Molybdenum	mg/L	0.0001	0.0004	0.0001	0.0018	0.0005	<0.0001
Nickel	mg/L	0.0002	0.0208	0.0006	0.0004	0.0008	0.0008
Selenium	mg/L	0.001	0.005	<0.001	<0.001	0.002	<0.001
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.00012	<0.00005	0.00073	0.00024	0.00007
Vanadium	mg/L	0.0001	0.0091	<0.0001	<0.0004	0.0004	<0.0001
Chromium (VI)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	59.3	5.56	51.5	15.8	5.09
Cation Sum	meq/L	-	50.4	5.98	45.9	15.3	5.31
% Difference	%	-	8.17	3.61	5.67	1.67	2.19
Ion Ratio	-	-	1.18	0.930	1.12	1.03	0.957
Sodium Adsorption Ratio	-	-	3.83	0.303	9.07	1.43	0.0243
TDS (Ion Sum Calc)	mg/L	1	2920	295	3060	939	262
TDS(calc.)/EC(actual)	-	-	0.583	0.551	0.679	0.645	0.542
Conductivity Calc	µmho/cm	-	3840	541	3970	1460	486
Conductivity Calc / Conductivity	-	-	0.767	1.01	0.880	1.00	1.00
Langelier Index(25°C)	-	-	1.56	0.532	0.599	0.802	0.765



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			Client I.D.	MW17	MW202	MW203	MW204	DUP
			Sample I.D.	25-010879-16	25-010879-17	25-010879-18	25-010879-19	25-010879-20
			Date Collected	2025-04-21	2025-04-21	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.		-	-	-	-	-
Saturation pH (25°C)	-	-		5.45	7.22	7.14	7.01	7.04
pH (Client Data)	pH units	-		6.3	7.08	7.15	7.02	6.54
Temperature (Client Data)	°C	-		9.3	7.7	6.7	6.2	6.3



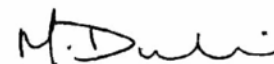
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		Client I.D.	DUP-1
		Sample I.D.	25-010879-21
		Date Collected	2025-04-21
Parameter	Units	R.L.	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	218
TDS (Calc. from Cond.)	mg/L	3	230
Conductivity @25°C	uS/cm	1	446
pH @25°C	pH units	-	7.96
Colour	TCU	2	<2
Turbidity	NTU	0.1	1290
Fluoride	mg/L	0.1	<0.1
Chloride	mg/L	0.5	8.3
Nitrate (N)	mg/L	0.05	0.34
Nitrite (N)	mg/L	0.05	<0.05
Sulphate	mg/L	1	8
BOD5	mg/L	3	<3
Total Suspended Solids	mg/L	3	9300
Phosphorus (Total)	mg/L	0.01	4.73
Total Kjeldahl Nitrogen	mg/L	0.1	1.5
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.15
Ammonia (N)-unionized	mg/L	0.01	<0.01
Dissolved Organic Carbon	mg/L	0.8	1.6
Cyanide (WAD)	mg/L	0.005	<0.005
Phenolics	mg/L	0.001	<0.001
COD	mg/L	5	77



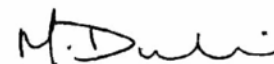
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		Client I.D.	DUP-1
		Sample I.D.	25-010879-21
		Date Collected	2025-04-21
Parameter	Units	R.L.	-
Hardness (as CaCO3)	mg/L	0.02	246
Aluminum	mg/L	0.01	0.13
Barium	mg/L	0.001	0.085
Boron	mg/L	0.005	0.006
Calcium	mg/L	0.02	77.6
Iron	mg/L	0.005	0.168
Magnesium	mg/L	0.02	12.7
Manganese	mg/L	0.001	0.008
Phosphorus	mg/L	0.1	<0.1
Potassium	mg/L	0.1	1.8
Sodium	mg/L	0.2	4.6
Strontium	mg/L	0.001	0.173
Tin	mg/L	0.05	<0.05
Titanium	mg/L	0.005	0.008
Zinc	mg/L	0.005	<0.005
Antimony	mg/L	0.0001	<0.0001
Arsenic	mg/L	0.0001	0.0002
Beryllium	mg/L	0.0001	<0.0001
Cadmium	mg/L	0.00001 5	<0.000015
Chromium	mg/L	0.001	0.003
Cobalt	mg/L	0.0001	0.0004



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		Client I.D.	DUP-1
		Sample I.D.	25-010879-21
		Date Collected	2025-04-21
Parameter	Units	R.L.	-
Copper	mg/L	0.0001	0.0011
Lead	mg/L	0.00002	0.00014
Molybdenum	mg/L	0.0001	0.0003
Nickel	mg/L	0.0002	0.0004
Selenium	mg/L	0.001	<0.001
Silver	mg/L	0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005
Uranium	mg/L	0.00005	0.00073
Vanadium	mg/L	0.0001	0.0027
Chromium (VI)	mg/L	0.01	<0.01
Mercury	mg/L	0.00002	<0.00002
Anion Sum	meq/L	-	4.76
Cation Sum	meq/L	-	5.18
% Difference	%	-	4.14
Ion Ratio	-	-	0.920
Sodium Adsorption Ratio	-	-	0.126
TDS (Ion Sum Calc)	mg/L	1	245
TDS(calc.)/EC(actual)	-	-	0.549
Conductivity Calc	µmho/cm	-	465
Conductivity Calc / Conductivity	-	-	1.04
Langelier Index(25°C)	-	-	0.755



Michelle Dubien
Data Specialist

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		Client I.D.	DUP-1
		Sample I.D.	25-010879-21
		Date Collected	2025-04-21
Parameter	Units	R.L.	-
Saturation pH (25°C)	-	-	7.21
pH (Client Data)	pH units	-	7.02
Temperature (Client Data)	°C	-	7.2

Elevated RLs due to sample matrix interferences



Michelle Dubien
Data Specialist

C.O.C.: -

REPORT No: 25-010884 - Rev. 0

Report To:

City of Kawartha Lakes
PO Box 9000
322 Kent Street West
Lindsay, ON K9V 4T7

CADUCEON Environmental Laboratories

285 Dalton Ave
Kingston, ON K7K 6Z1

Attention: Bonnie Ferguson

DATE RECEIVED: 2025-Apr-24
DATE REPORTED: 2025-May-12
SAMPLE MATRIX: Surface Water

CUSTOMER PROJECT: Somerville Landfill
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	3	OTTAWA	PCURIEL	2025-Apr-30	A-IC-01	SM 4110B
BOD5 (Liquid)	3	KINGSTON	JWOLFE2	2025-May-02	BOD-001	SM 5210B
COD (Liquid)	3	KINGSTON	MWILSON	2025-May-08	COD-001	SM 5220D
Colour (Liquid)	3	OTTAWA	STAILLON	2025-Apr-29	A-COL-01	SM 2120C
Cond/pH/Alk Auto (Liquid)	3	OTTAWA	SBOUDREAU	2025-Apr-29	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
Cyanide WAD (Liquid)	3	KINGSTON	EHINCH	2025-Apr-28	CN-001	SM 4500-CN-E
DOC (Liquid)	3	OTTAWA	SLOZO	2025-May-10	C-OC-01	EPA 415.2
Ion Balance (Calc.)	3	OTTAWA	ASCHNEIDER		CP-028	MECP E3196
Chromium VI (Liquid)	3	OTTAWA	STAILLON	2025-Apr-30	D-CRVI-01	MECP E3056
ICP/MS Total (Liquid)	3	OTTAWA	TPRICE	2025-Apr-29	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	3	OTTAWA	SGORMAN	2025-Apr-30	D-ICP-01	SM 3120B
ICP/OES (Liquid)	3	OTTAWA	GFENTON	2025-Apr-30	D-ICP-01	SM 3120B
Mercury (Liquid)	3	OTTAWA	TBENNETT	2025-Apr-30	D-HG-02	SM 3112B
Ammonia & o-Phosphate (Liquid)	3	KINGSTON	VHAMMOND	2025-May-06	NH3-001	SM 4500NH3
Phenols (Liquid)	3	KINGSTON	EHINCH	2025-May-02	PHEN-01	MECP E3179
Total Organic Carbon (TOC)	3	OTTAWA	ASCHNEIDER	2025-May-02	C-OC-01	EPA 415.2
TP & TKN (Liquid)	3	KINGSTON	YLIEN	2025-May-08	TPTKN-001	MECP E3516.2
TSS (Liquid)	3	KINGSTON	MCLOSS	2025-Apr-30	TSS-001	SM 2540D
Turbidity (Liquid)	3	OTTAWA	MMIRELLA	2025-Apr-29	A-TURB-01	SM 2130B

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *



Michelle Dubien
Data Specialist

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Final Report
REPORT No: 25-010884 - Rev. 0

Parameter	Client I.D.		SW D	SW A	SW B
	Sample I.D.		25-010884-1	25-010884-2	25-010884-3
	Date Collected		2025-04-21	2025-04-21	2025-04-21
	Units	R.L.	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	164	164	159
Conductivity @25°C	uS/cm	1	316	321	311
pH @25°C	pH units	-	8.06	7.96	7.99
Colour	TCU	2	8	8	8
Turbidity	NTU	0.1	0.5	0.4	0.5
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1
Chloride	mg/L	0.5	2.3	1.1	1.2
Nitrate (N)	mg/L	0.05	<0.05	<0.05	<0.05
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	2	4	3
BOD5	mg/L	3	<3	<3	<3
Total Suspended Solids	mg/L	3	4	17	10
Phosphorus (Total)	mg/L	0.01	0.02	0.02	0.01
Total Kjeldahl Nitrogen	mg/L	0.1	0.3	0.3	0.2
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	<0.05	<0.05	<0.05
Ammonia (N)-unionized	mg/L	0.01	<0.01	<0.01	<0.01
Dissolved Organic Carbon	mg/L	0.8	5.1	5.6	5.5
Total Organic Carbon	mg/L	0.8	4.7	5.4	5.2
Cyanide (WAD)	mg/L	0.005	<0.005	<0.005	<0.005
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001
COD	mg/L	5	11	15	13



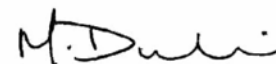
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			Client I.D.	SW D	SW A	SW B
			Sample I.D.	25-010884-1	25-010884-2	25-010884-3
			Date Collected	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.		-	-	-
Aluminum	mg/L	0.01		0.04	0.02	0.02
Hardness (as CaCO3)	mg/L	0.02		181	177	179
Aluminum (Total)	mg/L	0.01		0.04	0.05	0.04
Barium (Total)	mg/L	0.001		0.019	0.013	0.013
Boron (Total)	mg/L	0.005		0.006	<0.005	<0.005
Calcium (Total)	mg/L	0.02		69.0	68.1	68.8
Iron (Total)	mg/L	0.005		0.064	0.019	0.017
Magnesium (Total)	mg/L	0.02		1.96	1.59	1.60
Manganese (Total)	mg/L	0.001		0.008	0.004	0.003
Phosphorus (Total)	mg/L	0.1		<0.1	<0.1	<0.1
Potassium (Total)	mg/L	0.1		0.4	0.4	0.3
Sodium (Total)	mg/L	0.2		1.5	0.8	0.9
Strontium (Total)	mg/L	0.001		0.121	0.102	0.102
Tin (Total)	mg/L	0.05		<0.05	<0.05	<0.05
Titanium (Total)	mg/L	0.005		<0.005	<0.005	<0.005
Zinc (Total)	mg/L	0.005		<0.005	0.010	0.007
Antimony (Total)	mg/L	0.0001		0.0004	0.0004	0.0003
Arsenic (Total)	mg/L	0.0001		0.0001	0.0001	0.0001
Beryllium (Total)	mg/L	0.0001		<0.0001	<0.0001	<0.0001
Cadmium (Total)	mg/L	0.000015		<0.000015	<0.000015	<0.000015
Chromium (Total)	mg/L	0.001		<0.001	<0.001	<0.001



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REPORT No: 25-010884 - Rev. 0

Client I.D.			SW D	SW A	SW B
Sample I.D.			25-010884-1	25-010884-2	25-010884-3
Date Collected			2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.	-	-	-
Cobalt (Total)	mg/L	0.0001	0.0002	0.0002	0.0001
Copper (Total)	mg/L	0.0001	0.0003	0.0003	0.0002
Lead (Total)	mg/L	0.00002	0.00004	<0.00002	0.00002
Molybdenum (Total)	mg/L	0.0001	<0.0001	<0.0001	<0.0001
Nickel (Total)	mg/L	0.0002	0.0007	0.0007	0.0006
Selenium (Total)	mg/L	0.001	<0.001	<0.001	<0.001
Silver (Total)	mg/L	0.0001	<0.0001	<0.0001	<0.0001
Thallium (Total)	mg/L	0.00005	<0.00005	<0.00005	<0.00005
Uranium (Total)	mg/L	0.00005	0.00005	<0.00005	<0.00005
Vanadium (Total)	mg/L	0.0001	0.0001	<0.0001	<0.0001
Chromium (VI)	mg/L	0.001	<0.001	<0.001	<0.001
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002
Anion Sum	meq/L	-	3.38	3.39	3.29
Cation Sum	meq/L	-	3.69	3.58	3.61
% Difference	%	-	4.29	2.63	4.74
Ion Ratio	-	-	0.918	0.949	0.910
Sodium Adsorption Ratio	-	-	0.0497	0.0253	0.0278
TDS (Ion Sum Calc)	mg/L	1	176	174	172
TDS(calc.)/EC(actual)	-	-	0.556	0.543	0.552
Conductivity Calc	µmho/cm	-	336	331	329
Conductivity Calc / Conductivity	-	-	1.06	1.03	1.06



Michelle Dubien
Data Specialist

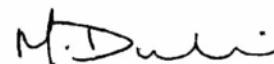
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REPORT No: 25-010884 - Rev. 0

			Client I.D.	SW D	SW A	SW B
			Sample I.D.	25-010884-1	25-010884-2	25-010884-3
			Date Collected	2025-04-21	2025-04-21	2025-04-21
Parameter	Units	R.L.		-	-	-
Langelier Index(25°C)	-	-		0.702	0.596	0.617
Saturation pH (25°C)	-	-		7.36	7.36	7.37
pH (Client Data)	pH units	-		7.47	7.21	7.17
Temperature (Client Data)	°C	-		6.5	7.5	6.7

TOC less than DOC due to filtering



Michelle Dubien
Data Specialist

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C.O.C.: _

REPORT No: 25-031259 - Rev. 0

Report To:

City of Kawartha Lakes
PO Box 9000
322 Kent Street West
Lindsay, ON K9V 4T7

CADUCEON Environmental Laboratories

110 West Beaver Creek Rd
Unit #14
Richmond Hill, ON L4B 1J9

Attention: Kayla Pantaleo

DATE RECEIVED: 2025-Oct-09
DATE REPORTED: 2025-Oct-21
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: Somerville Landfill
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	13	OTTAWA	PCURIEL	2025-Oct-15	A-IC-01	SM 4110B
BOD5 (Liquid)	13	KINGSTON	DCASSIDY	2025-Oct-15	BOD-001	SM 5210B
COD (Liquid)	13	KINGSTON	MWILSON	2025-Oct-15	COD-001	SM 5220D
Colour (Liquid)	13	OTTAWA	STAILLON	2025-Oct-15	A-COL-01	SM 2120C
Cond/pH/Alk Auto (Liquid)	13	OTTAWA	SBOUDREAU	2025-Oct-14	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
Cyanide WAD (Liquid)	13	KINGSTON	EHINCH	2025-Oct-14	CN-001	SM 4500-CN-E
DOC (Liquid)	13	OTTAWA	SLOZO	2025-Oct-15	C-OC-01	EPA 415.2
Ion Balance (Calc.)	13	OTTAWA	ASCHNEIDER		CP-028	MECP E3196
Chromium VI (Liquid)	13	OTTAWA	STAILLON	2025-Oct-17	D-CRVI-01	MECP E3056
ICP/MS (Liquid)	13	OTTAWA	GFENTON	2025-Oct-17	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	13	OTTAWA	SGORMAN	2025-Oct-16	D-ICP-01	SM 3120B
Mercury (Liquid)	13	OTTAWA	TBENNETT	2025-Oct-16	D-HG-02	SM 3112B
Ammonia (Liquid)	13	KINGSTON	VHAMMOND	2025-Oct-16	NH3-001	SM 4500NH3
Phenols (Liquid)	13	KINGSTON	EHINCH	2025-Oct-15	PHEN-01	MECP E3179
TP & TKN (Liquid)	13	KINGSTON	DCASSIDY	2025-Oct-17	TPTKN-001	MECP E3516.2
TSS (Liquid)	13	KINGSTON	MCLOSS	2025-Oct-16	TSS-001	SM 2540D
Turbidity (Liquid)	13	OTTAWA	ABAILEY	2025-Oct-14	A-TURB-01	SM 2130B
VOC-Volatiles Full (Water)	13	RICHMOND_HILL	FLENA	2025-Oct-12	C-VOC-02	EPA 8260

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *



Michelle Dubien
Data Specialist

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Final Report

REPORT No: 25-031259 - Rev. 0

Client I.D.			MW1-I	MW2-II	MW10-II	MW13	MW14
Sample I.D.			25-031259-1	25-031259-2	25-031259-3	25-031259-4	25-031259-5
Date Collected			2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	626	426	281	226	687
TDS (Calc. from Cond.) (Calculated)	mg/L	3	589	605	309	382	988
Conductivity @25°C	uS/cm	1	1100	1130	595	732	1800
pH @25°C	pH units	-	7.39	7.54	7.91	7.71	7.32
Colour	TCU	2	<2	2	<2	<2	<2
Turbidity	NTU	0.1	791 (17)	153 (17)	94.6 (17)	103 (17)	160 (17)
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	mg/L	0.5	1.0	96.8	10.7	91.6	182
Nitrate (N)	mg/L	0.05	1.00	0.53	2.38	0.14	1.05
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	4	35	18	10	29
BOD5	mg/L	3	<3	<3	<3	<3	<3
Total Suspended Solids	mg/L	3	30500	860	490	202	70
Phosphorus (Total)	mg/L	0.01	1.64	0.31	0.16	0.13	0.09
Total Kjeldahl Nitrogen	mg/L	0.1	0.4	1.0	0.2	0.6	0.4
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.07	0.19	<0.05	0.16	0.10
Ammonia (N)-unionized (Calculated)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Organic Carbon	mg/L	0.8	8.0	16.4	3.9	4.1	7.1
Cyanide (WAD)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenolics	mg/L	0.001	<0.001	0.002	<0.001	<0.001	<0.001
COD	mg/L	5	77	60	24	12	18



**Michelle Dubien
Data Specialist**

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Final Report

REPORT No: 25-031259 - Rev. 0

			Client I.D.	MW1-I	MW2-II	MW10-II	MW13	MW14
			Sample I.D.	25-031259-1	25-031259-2	25-031259-3	25-031259-4	25-031259-5
			Date Collected	2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.		-	-	-	-	-
Hardness (as CaCO3)	mg/L	0.02		614	549	298	311	816
Aluminum	mg/L	0.01		0.07	0.05	0.03	0.04	0.09
Barium	mg/L	0.001		0.208	0.287	0.134	0.094	0.424
Boron	mg/L	0.005		0.012	0.604	0.108	0.018	0.024
Calcium	mg/L	0.02		223	173	82.9	118	297
Iron	mg/L	0.005		2.69	0.410	<0.005	<0.005	6.84
Magnesium	mg/L	0.02		13.8	28.5	22.2	3.88	18.0
Manganese	mg/L	0.001		2.08	0.105	<0.001	0.001	1.58
Phosphorus	mg/L	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1		3.5	3.9	4.6	0.7	2.3
Sodium	mg/L	0.2		2.3	17.1	11.5	13.9	39.0
Strontium	mg/L	0.001		0.543	0.475	0.287	0.313	0.678
Tin	mg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005		<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.005		<0.005	<0.005	<0.005	<0.005	<0.005
Antimony	mg/L	0.0001		0.0001	0.0001	0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001		0.0004	0.0008	0.0001	<0.0001	0.0008
Beryllium	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015		<0.000015	<0.000015	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001		0.0063	0.0130	0.0002	0.0002	0.0111



**Michelle Dubien
Data Specialist**

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Final Report

REPORT No: 25-031259 - Rev. 0

			Client I.D.	MW1-I	MW2-II	MW10-II	MW13	MW14
			Sample I.D.	25-031259-1	25-031259-2	25-031259-3	25-031259-4	25-031259-5
			Date Collected	2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.		-	-	-	-	-
Copper	mg/L	0.0001		0.0006	0.0008	0.0007	0.0004	0.0004
Lead	mg/L	0.00002		0.00004	<0.00002	<0.00002	<0.00002	<0.00004
Molybdenum	mg/L	0.0001		0.0004	0.0004	0.0009	<0.0001	0.0004
Nickel	mg/L	0.0002		0.0019	0.0057	0.0008	0.0010	0.0044
Selenium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005		<0.00005	<0.00005	<0.00005	<0.00005	0.00007
Uranium	mg/L	0.00005		0.00035	0.00196	0.00378	0.00008	0.00078
Vanadium	mg/L	0.0001		0.0002	0.0003	0.0015	<0.0001	0.0002
Chromium (VI)	mg/L	0.01		<0.01 (25)	<0.01 (25)	<0.01 (25)	<0.01 (25)	<0.01 (25)
Mercury	mg/L	0.00002		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Anion Sum (Calculated)	meq/L	-		12.7	12.0	6.46	7.30	19.6
Cation Sum (Calculated)	meq/L	-		12.7	11.8	6.58	6.84	18.5
% Difference (Calculated)	%	-		0.00253	0.695	0.981	3.27	2.80
Ion Ratio (Calculated)	-	-		1.00	1.01	0.981	1.07	1.06
Sodium Adsorption Ratio (Calculated)	-	-		0.0396	0.317	0.289	0.343	0.595
TDS (Ion Sum Calc) (Calculated)	mg/L	1		632	612	329	374	993
TDS(calc.)/EC(actual) (Calculated)	-	-		0.576	0.543	0.553	0.510	0.552
Conductivity Calc	µmho/cm	-		1070	1100	599	711	1660
Conductivity Calc / Conductivity (Calculated)	-	-		0.973	0.973	1.01	0.972	0.923
Langelier Index(25°C) (Calculated)	-	-		1.06	0.934	0.835	0.683	1.13



**Michelle Dubien
Data Specialist**

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Final Report

REPORT No: 25-031259 - Rev. 0

			Client I.D.	MW1-I	MW2-II	MW10-II	MW13	MW14
			Sample I.D.	25-031259-1	25-031259-2	25-031259-3	25-031259-4	25-031259-5
			Date Collected	2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.		-	-	-	-	-
Saturation pH (25°C) (Calculated)	-	-		6.33	6.61	7.08	7.03	6.19
pH (Client Data)	pH units	-		7.15	7.18	7.39	7.48	6.62
Temperature (Client Data)	°C	-		9.4	8.8	9.2	8.0	8.9



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Client I.D.			MW15	MW16-III	MW201D	MW202	MW203
Sample I.D.			25-031259-6	25-031259-7	25-031259-8	25-031259-9	25-031259-10
Date Collected			2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.	-	-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	266	230	232	220	138
TDS (Calc. from Cond.) (Calculated)	mg/L	3	294	244	289	278	2490
Conductivity @25°C	uS/cm	1	567	471	557	537	4410
pH @25°C	pH units	-	7.73	7.89	7.75	7.82	7.67
Colour	TCU	2	<2	<2	2	<2	<2
Turbidity	NTU	0.1	11.0 (17)	1650 (17)	1370 (17)	40.9 (17)	15.0 (17)
Fluoride	mg/L	0.1	0.2	<0.1	<0.1	0.5	1.1
Chloride	mg/L	0.5	3.1	10.6	14.6	16.7	797
Nitrate (N)	mg/L	0.05	0.15	0.21	<0.05	<0.05	0.43
Nitrite (N)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	0.13
Sulphate	mg/L	1	35	8	48	42	1240
BOD5	mg/L	3	<3	<3	<3	<3	4
Total Suspended Solids	mg/L	3	20	10600	1060	102	32
Phosphorus (Total)	mg/L	0.01	0.02	2.72	0.80	0.04	0.04
Total Kjeldahl Nitrogen	mg/L	0.1	0.8	0.5	1.2	0.4	1.8
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.28	0.35	0.22	0.30	1.40
Ammonia (N)-unionized (Calculated)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.02
Dissolved Organic Carbon	mg/L	0.8	4.3	3.1	7.1	4.2	1.3
Cyanide (WAD)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenolics	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001
COD	mg/L	5	12	63	70	5	31



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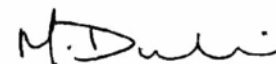
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Client I.D.			MW15	MW16-III	MW201D	MW202	MW203
Sample I.D.			25-031259-6	25-031259-7	25-031259-8	25-031259-9	25-031259-10
Date Collected			2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.	-	-	-	-	-
Hardness (as CaCO3)	mg/L	0.02	280	235	257	250	895
Aluminum	mg/L	0.01	0.03	0.02	0.03	0.02	0.05
Barium	mg/L	0.001	0.040	0.085	0.042	0.018	0.015
Boron	mg/L	0.005	0.113	<0.005	0.080	0.387	4.41
Calcium	mg/L	0.02	102	71.9	93.8	72.5	167
Iron	mg/L	0.005	0.005	<0.005	0.815	0.030	0.101
Magnesium	mg/L	0.02	6.37	13.3	5.54	16.6	116
Manganese	mg/L	0.001	<0.001	<0.001	0.045	0.009	0.013
Phosphorus	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1	1.8	2.3	1.4	3.5	15.8
Sodium	mg/L	0.2	1.7	5.3	14.6	11.1	627
Strontium	mg/L	0.001	1.45	0.196	0.935	5.62	10.8
Tin	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Antimony	mg/L	0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0002
Arsenic	mg/L	0.0001	0.0001	0.0001	0.0033	0.0002	0.0014
Beryllium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	<0.000015	<0.000015	<0.000015	<0.000015	<0.000030
Chromium	mg/L	0.001	<0.001	0.002	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001	0.0002	0.0003	0.0005	0.0002	0.0003



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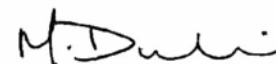
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			Client I.D.	MW15	MW16-III	MW201D	MW202	MW203
			Sample I.D.	25-031259-6	25-031259-7	25-031259-8	25-031259-9	25-031259-10
			Date Collected	2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.		-	-	-	-	-
Copper	mg/L	0.0001		0.0007	0.0006	0.0002	0.0003	0.0029
Lead	mg/L	0.00002		<0.00002	<0.00002	<0.00002	<0.00002	<0.00009
Molybdenum	mg/L	0.0001		0.0009	0.0003	0.0009	0.0001	0.0019
Nickel	mg/L	0.0002		0.0006	0.0006	0.0017	0.0008	0.0011
Selenium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005		0.00046	0.00071	0.00023	<0.00005	0.00074
Vanadium	mg/L	0.0001		<0.0001	0.0023	0.0002	<0.0001	<0.0004
Chromium (VI)	mg/L	0.01		<0.01 (25)	<0.01 (25)	<0.01 (25)	<0.01 (25)	<0.01 (25)
Mercury	mg/L	0.00002		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Anion Sum (Calculated)	meq/L	-		6.15	5.08	6.04	5.78	51.2
Cation Sum (Calculated)	meq/L	-		5.75	4.98	5.88	5.69	45.9
% Difference (Calculated)	%	-		3.37	1.03	1.37	0.785	5.39
Ion Ratio (Calculated)	-	-		1.07	1.02	1.03	1.02	1.11
Sodium Adsorption Ratio (Calculated)	-	-		0.0440	0.151	0.397	0.306	9.12
TDS (Ion Sum Calc) (Calculated)	mg/L	1		310	251	318	295	3050
TDS(calc.)/EC(actual) (Calculated)	-	-		0.547	0.532	0.571	0.550	0.692
Conductivity Calc	µmho/cm	-		550	469	563	535	3950
Conductivity Calc / Conductivity (Calculated)	-	-		0.970	0.995	1.01	0.997	0.896
Langelier Index(25°C) (Calculated)	-	-		0.719	0.676	0.645	0.580	0.501



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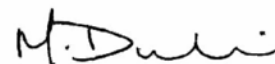
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			Client I.D.	MW15	MW16-III	MW201D	MW202	MW203
			Sample I.D.	25-031259-6	25-031259-7	25-031259-8	25-031259-9	25-031259-10
			Date Collected	2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.		-	-	-	-	-
Saturation pH (25°C) (Calculated)	-	-		7.01	7.21	7.11	7.24	7.17
pH (Client Data)	pH units	-		7.61	7.76	7.69	7.83	7.87
Temperature (Client Data)	°C	-		8.8	9.6	8.0	7.9	8.3



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Parameter	Client I.D.		MW204	Dup	Dup-1
	Sample I.D.		25-031259-11	25-031259-12	25-031259-13
	Date Collected		2025-10-08	2025-10-08	2025-10-08
	Units	R.L.	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	161	231	163
TDS (Calc. from Cond.) (Calculated)	mg/L	3	1220	244	1150
Conductivity @25°C	uS/cm	1	2210	471	2090
pH @25°C	pH units	-	7.73	7.94	7.72
Colour	TCU	2	<2	<2	<2
Turbidity	NTU	0.1	9.0 (17)	2360 (17)	21.9 (17)
Fluoride	mg/L	0.1	<0.7	<0.1	<0.7
Chloride	mg/L	0.5	215	10.5	199
Nitrate (N)	mg/L	0.05	<0.40	0.22	<0.40
Nitrite (N)	mg/L	0.05	<0.40	<0.05	<0.40
Sulphate	mg/L	1	741	8	703
BOD5	mg/L	3	<3	<3	<3
Total Suspended Solids	mg/L	3	22	12100	23
Phosphorus (Total)	mg/L	0.01	0.02	2.36	0.03
Total Kjeldahl Nitrogen	mg/L	0.1	0.2	0.3	0.2
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.07	0.12	0.08
Ammonia (N)-unionized (Calculated)	mg/L	0.01	<0.01	<0.01	<0.01
Dissolved Organic Carbon	mg/L	0.8	3.3	3.3	3.4
Cyanide (WAD)	mg/L	0.005	<0.005	<0.005	<0.005
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001
COD	mg/L	5	21	71	7



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			Client I.D.	MW204	Dup	Dup-1
			Sample I.D.	25-031259-11	25-031259-12	25-031259-13
			Date Collected	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.		-	-	-
Hardness (as CaCO3)	mg/L	0.02		961	227	926
Aluminum	mg/L	0.01		0.13	0.02	0.13
Barium	mg/L	0.001		0.027	0.083	0.027
Boron	mg/L	0.005		1.88	0.008	1.79
Calcium	mg/L	0.02		265	69.2	257
Iron	mg/L	0.005		<0.005	<0.005	<0.005
Magnesium	mg/L	0.02		72.6	13.2	68.9
Manganese	mg/L	0.001		0.020	<0.001	0.018
Phosphorus	mg/L	0.1		<0.1	<0.1	<0.1
Potassium	mg/L	0.1		8.1	2.3	7.9
Sodium	mg/L	0.2		139	5.3	131
Strontium	mg/L	0.001		6.20	0.196	5.98
Tin	mg/L	0.05		<0.05	<0.05	<0.05
Titanium	mg/L	0.005		<0.005	<0.005	<0.005
Zinc	mg/L	0.005		<0.005	<0.005	0.006
Antimony	mg/L	0.0001		0.0006	<0.0001	0.0001
Arsenic	mg/L	0.0001		0.0006	0.0001	0.0006
Beryllium	mg/L	0.0001		<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015		0.000028	<0.000015	<0.000015
Chromium	mg/L	0.001		<0.001	0.002	<0.001
Cobalt	mg/L	0.0001		0.0002	0.0003	0.0002



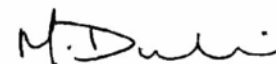
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Parameter	Client I.D.		MW204	Dup	Dup-1
	Sample I.D.		25-031259-11	25-031259-12	25-031259-13
	Date Collected		2025-10-08	2025-10-08	2025-10-08
	Units	R.L.	-	-	-
Copper	mg/L	0.0001	0.0009	0.0004	0.0007
Lead	mg/L	0.00002	<0.00004	<0.00002	<0.00004
Molybdenum	mg/L	0.0001	0.0017	0.0003	0.0005
Nickel	mg/L	0.0002	0.0013	0.0006	0.0012
Selenium	mg/L	0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.00020	0.00070	0.00021
Vanadium	mg/L	0.0001	0.0004	0.0022	0.0003
Chromium (VI)	mg/L	0.01	<0.01 (25)	<0.01 (25)	<0.01 (25)
Mercury	mg/L	0.00002	<0.00002	<0.00002	<0.00002
Anion Sum (Calculated)	meq/L	-	24.7	5.11	23.5
Cation Sum (Calculated)	meq/L	-	25.6	4.83	24.5
% Difference (Calculated)	%	-	1.69	2.78	2.05
Ion Ratio (Calculated)	-	-	0.967	1.06	0.960
Sodium Adsorption Ratio (Calculated)	-	-	1.95	0.153	1.87
TDS (Ion Sum Calc) (Calculated)	mg/L	1	1540	249	1470
TDS(calc.)/EC(actual) (Calculated)	-	-	0.696	0.528	0.701
Conductivity Calc	µmho/cm	-	2160	462	2080
Conductivity Calc / Conductivity (Calculated)	-	-	0.975	0.982	0.993
Langelier Index(25°C) (Calculated)	-	-	0.848	0.712	0.829



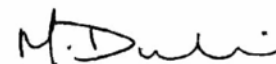
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			Client I.D.	MW204	Dup	Dup-1
			Sample I.D.	25-031259-11	25-031259-12	25-031259-13
			Date Collected	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.		-	-	-
Saturation pH (25°C) (Calculated)	-	-		6.88	7.23	6.89
pH (Client Data)	pH units	-		7.88	7.76	7.88
Temperature (Client Data)	°C	-		7.6	9.6	7.6



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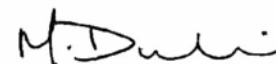
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Client I.D.			MW1-I	MW2-II	MW10-II	MW13	MW14
Sample I.D.			25-031259-1	25-031259-2	25-031259-3	25-031259-4	25-031259-5
Date Collected			2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.	-	-	-	-	-
Acetone	µg/L	30	<30	<30	<30	<30	<30
Benzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	µg/L	2	<2	<2	<2	<2	<2
Bromoform	µg/L	5	<5	<5	<5	<5	<5
Bromomethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	µg/L	1	<1	<1	<1	<1	<1
Chloromethane (Methyl Chloride)	µg/L	2	<2	<2	<2	<2	<2
Dibromochloromethane	µg/L	2	<2	<2	<2	<2	<2
Ethylene Dibromide	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dichlorobenzene,1,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorobenzene,1,3-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorobenzene,1,4-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethane,1,1-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethane,1,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,1-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,2-cis-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,2-trans-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloropropane,1,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloropropene,1,3-cis-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5



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Client I.D.			MW1-I	MW2-II	MW10-II	MW13	MW14
Sample I.D.			25-031259-1	25-031259-2	25-031259-3	25-031259-4	25-031259-5
Date Collected			2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.	-	-	-	-	-
Dichloropropene, 1,3-trans-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloromethane (Methylene Chloride)	µg/L	5	<5	<5	<5	<5	<5
Methyl Ethyl Ketone	µg/L	2	<2	<2	<2	<2	<2
Methyl Isobutyl Ketone	µg/L	20	<20	<20	<20	<20	<20
Methyl tert-Butyl Ether (MTBE)	µg/L	2	<2	<2	<2	<2	<2
Styrene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorobenzene, 1,2,4-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethane, 1,1,1-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethane, 1,1,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane (Freon 11)	µg/L	5	<5	<5	<5	<5	<5
Vinyl Chloride	µg/L	0.2	<0.2	0.4	<0.2	<0.2	<0.2
Xylene, m,p-	µg/L	1	<1	<1	<1	<1	<1
Xylene, o-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5



**Michelle Dubien
Data Specialist**

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Final Report

REPORT No: 25-031259 - Rev. 0

Client I.D.			MW15	MW16-III	MW201D	MW202	MW203
Sample I.D.			25-031259-6	25-031259-7	25-031259-8	25-031259-9	25-031259-10
Date Collected			2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.	-	-	-	-	-
Acetone	µg/L	30	<30	<30	<30	<30	<30
Benzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	µg/L	2	<2	<2	<2	<2	<2
Bromoform	µg/L	5	<5	<5	<5	<5	<5
Bromomethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	µg/L	1	<1	<1	<1	<1	<1
Chloromethane (Methyl Chloride)	µg/L	2	<2	<2	<2	<2	<2
Dibromochloromethane	µg/L	2	<2	<2	<2	<2	<2
Ethylene Dibromide	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dichlorobenzene,1,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorobenzene,1,3-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorobenzene,1,4-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethane,1,1-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethane,1,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,1-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,2-cis-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,2-trans-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloropropane,1,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloropropene,1,3-cis-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5



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Data Specialist**

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Final Report

REPORT No: 25-031259 - Rev. 0

Client I.D.			MW15	MW16-III	MW201D	MW202	MW203
Sample I.D.			25-031259-6	25-031259-7	25-031259-8	25-031259-9	25-031259-10
Date Collected			2025-10-08	2025-10-08	2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.	-	-	-	-	-
Dichloropropene, 1,3-trans-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloromethane (Methylene Chloride)	µg/L	5	<5	<5	<5	<5	<5
Methyl Ethyl Ketone	µg/L	2	<2	<2	<2	<2	<2
Methyl Isobutyl Ketone	µg/L	20	<20	<20	<20	<20	<20
Methyl tert-Butyl Ether (MTBE)	µg/L	2	<2	<2	<2	<2	<2
Styrene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorobenzene, 1,2,4-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethane, 1,1,1-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethane, 1,1,2-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane (Freon 11)	µg/L	5	<5	<5	<5	<5	<5
Vinyl Chloride	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene, m,p-	µg/L	1	<1	<1	<1	<1	<1
Xylene, o-	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5



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Final Report
REPORT No: 25-031259 - Rev. 0

Client I.D.			MW204	Dup	Dup-1
Sample I.D.			25-031259-11	25-031259-12	25-031259-13
Date Collected			2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.	-	-	-
Acetone	µg/L	30	<30	<30	<30
Benzene	µg/L	0.5	<0.5	<0.5	<0.5
Bromodichloromethane	µg/L	2	<2	<2	<2
Bromoform	µg/L	5	<5	<5	<5
Bromomethane	µg/L	0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	µg/L	0.2	<0.2	<0.2	<0.2
Chlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5
Chloroform	µg/L	1	<1	<1	<1
Chloromethane (Methyl Chloride)	µg/L	2	<2	<2	<2
Dibromochloromethane	µg/L	2	<2	<2	<2
Ethylene Dibromide	µg/L	0.2	<0.2	<0.2	<0.2
Dichlorobenzene,1,2-	µg/L	0.5	<0.5	<0.5	<0.5
Dichlorobenzene,1,3-	µg/L	0.5	<0.5	<0.5	<0.5
Dichlorobenzene,1,4-	µg/L	0.5	<0.5	<0.5	<0.5
Dichloroethane,1,1-	µg/L	0.5	<0.5	<0.5	<0.5
Dichloroethane,1,2-	µg/L	0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,1-	µg/L	0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,2-cis-	µg/L	0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,2-trans-	µg/L	0.5	<0.5	<0.5	<0.5
Dichloropropane,1,2-	µg/L	0.5	<0.5	<0.5	<0.5
Dichloropropene,1,3-cis-	µg/L	0.5	<0.5	<0.5	<0.5



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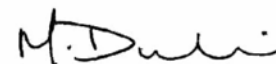
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Final Report
REPORT No: 25-031259 - Rev. 0

Client I.D.			MW204	Dup	Dup-1
Sample I.D.			25-031259-11	25-031259-12	25-031259-13
Date Collected			2025-10-08	2025-10-08	2025-10-08
Parameter	Units	R.L.	-	-	-
Dichloropropene, 1,3-trans-	µg/L	0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5
Dichloromethane (Methylene Chloride)	µg/L	5	<5	<5	<5
Methyl Ethyl Ketone	µg/L	2	<2	<2	<2
Methyl Isobutyl Ketone	µg/L	20	<20	<20	<20
Methyl tert-Butyl Ether (MTBE)	µg/L	2	<2	<2	<2
Styrene	µg/L	0.5	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	µg/L	0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5
Trichlorobenzene, 1,2,4-	µg/L	0.5	<0.5	<0.5	<0.5
Trichloroethane, 1,1,1,-	µg/L	0.5	<0.5	<0.5	<0.5
Trichloroethane, 1,1,2,-	µg/L	0.5	<0.5	<0.5	<0.5
Trichloroethylene	µg/L	0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane (Freon 11)	µg/L	5	<5	<5	<5
Vinyl Chloride	µg/L	0.2	<0.2	<0.2	<0.2
Xylene, m,p-	µg/L	1	<1	<1	<1
Xylene, o-	µg/L	0.5	<0.5	<0.5	<0.5

Comments:

17. Analyzed past holding time
25. Chromium (VI) result is based on Total Chromium
Elevated RLs due to sample matrix interferences



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APPENDIX E

Chemistry Summary Tables

Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	Trigger (75% RUC)	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I
				01-Jun-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24
Alkalinity	500	351	264	598	587	608	621	585	542	530	513	480	477	426	383	525	549	589	621	594
Aluminum	0.1	0.07	0.055	0.05	0.09	0.06	0.09	0.1	0.1	0.08	0.09	0.09	0.1	0.12	0.03	0.07	0.11	0.06	0.11	0.06
Ammonia, Total	NV	NV	NV	0.04	0.07	< 0.01	0.04	0.11	0.05	0.06	0.07	0.02	0.07	0.03	0.06	1.28	0.02	0.68	1.05	0.18
Antimony	0.006	0.002	0.001	< 0.0001	0.0001	< 0.0001	0.0001	0.0002	0.00016	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	<0.0001	<0.0001
Arsenic	0.01	0.003	0.002	0.001	0.0007	0.0014	0.0015	0.0016	0.00127	0.0009	0.0008	0.0004	0.0009	0.0007	0.0008	0.0004	0.0006	0.0003	0.0006	0.0005
Barium	1	0.3	0.22	0.191	0.163	0.219	0.211	0.25	0.216	0.205	0.183	0.186	0.191	0.178	0.082	0.176	0.193	0.171	0.193	0.192
Beryllium	NV	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001
Boron	5	1	0.9	0.02	0.011	< 0.005	0.016	0.015	0.021	0.014	0.015	0.012	0.023	0.013	0.005	0.013	0.013	0.01	0.014	0.011
Cadmium	0.005	0.001	0.001	< 0.00002	< 0.00002	0.000014	< 0.000014	0.000067	0.000008	< 0.000015	< 0.000015	0.000017	< 0.000015	0.000026	< 0.000015	< 0.000015	< 0.000012	< 0.000012	<0.000015	<0.000015
Calcium	NV	NV	NV	216	204	235	227	235	211	208	195	198	192	190	142	197	217	188	220	206
Chloride	250	150	113	1.9	< 0.5	0.9	0.9	< 0.5	1.5	0.9	1.2	1.3	1.4	1	1.6	0.9	< 0.5	0.7	0.8	0.9
Chromium	0.05	0.01	0.01	0.0026	0.0111	< 0.001	< 0.001	< 0.001	0.00033	< 0.001	< 0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001
Chromium (VI)	NV	NV	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.001	<0.01	<0.01
Cobalt	NV	NV	NV	0.008	0.007	0.009	0.009	0.011	0.00767	0.009	0.007	0.005	0.007	0.007	< 0.005	< 0.005	0.005	0.008	0.0086	0.0072
Chemical Oxygen Demand	NV	NV	NV	17	10	79	44	71	93	34	40	54	70	7	86	10	39	54	20	9
Conductivity (uS/cm)	NV	NV	NV	1070	1060	1070	1110	1110	1060	1020	958	920	884	856	674	981	1020	1070	1090	1050
Copper	1	0.5	0.38	< 0.0001	0.0003	0.0006	0.0005	0.0003	0.00056	0.0005	0.0001	0.0024	0.0003	0.0021	0.0011	0.0004	0.0006	0.0008	0.0004	0.0005
Dissolved Organic Carbon	5	4.6	3.5	2.6	2.9	5.5	3.1	5.9	6.4	4.1	4.6	5.2	3	5.8	3.8	3.9	3.8	4.1	8.4	7.6
Fluoride	1.5	0.5	0.34	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1
Hardness	500	376	282	590	562	640	620	643	581	566	533	540	524	519	397	539	592	517	599	567
Iron	0.3	0.2	0.12	7	0.046	7.17	8.04	6.66	10	3.44	8.72	2.9	7.21	6.11	< 0.005	2.46	5.64	2.76	6.26	5.26
Lead	0.01	0.003	0.002	< 0.00002	< 0.00002	< 0.00002	0.00005	< 0.00002	0.00005	0.00004	0.00004	0.00009	0.00002	0.00012	0.00025	0.00003	0.00006	< 0.00004	<0.00004	0.00004
Magnesium	NV	NV	NV	12.2	12.5	13.1	12.8	13.4	12.9	11.1	11.1	11	10.7	10.6	10.2	11.4	12.1	11.7	11.9	12.8
Manganese	0.05	0.03	0.02	1.87	1.34	1.96	2.02	2.06	1.97	2	1.82	1.83	1.69	1.73	0.104	1.45	1.79	1.49	2.05	1.89
Mercury	0.001	0.0003	0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002
Molybdenum	NV	NV	NV	0.0004	0.0021	0.0007	0.0005	0.0007	< 0.00004	0.0007	0.0005	0.0004	0.0005	0.0005	0.0005	0.0006	0.0006	0.0007	0.0004	0.0006
Nickel	NV	NV	NV	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.002	0.0031
Nitrate	10	2.6	2.0	< 0.1	< 0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05	0.08	< 0.05	0.1	<0.05	0.07
Nitrite	1	0.3	0.2	< 0.1	< 0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05
pH (unit)	6.5 - 8.5	NV	NV	7.31	7.26	7.09	7.5	7.56	7.61	7.43	7.41	7.56	7.3	7.38	7.93	7.67	7.44	7.56	7.36	7.52
Phenols	NV	NV	NV	< 0.001	< 0.001	< 0.001	0.005	< 0.001	0.012	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	<0.001	<0.001
Dissolved Phosphorous	NV	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1
Total Phosphorous	NV	NV	NV	2.44	1.12	2.32	2.23	7.51	3.63	4.08	1.01	2.18	1.91	0.92	3.59	1.15	0.97	0.78	0.58	0.96
Potassium	NV	NV	NV	2.6	2.9	2.5	2.9	3	3	2.7	2.7	2.7	2.7	2.7	3.1	2.8	2.8	2.9	2.9	3
Selenium	0.01	0.003	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	<0.001	<0.001
Silver	NV	NV	NV	< 0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001
Sodium	200	103	77	2.4	2.4	2.1	2.2	2.4	2.2	2	1.8	1.9	2	1.9	1.9	2.1	2	2	2	2.1
Strontium	NV	NV	NV	0.493	0.479	0.496	0.475	0.507	0.496	0.451	0.416	0.408	0.417	0.401	0.315	0.431	0.46	0.461	0.469	0.499
Sulphate	500	253	189	3	3	3	3	2	3	3	2	2	2	3	4	3	4	4	4	4
Total Dissolved Solids	500	392	294	605	578	630	631	616	571	551	533	510	506	473	393	538	575	566	586	560
Total Kjeldahl Nitrogen	NV	NV	NV	0.4	0.5	0.5	0.4	1	0.7	0.6	0.4	0.3	0.4	0.2	1	1.7	0.6	0.7	1.2	0.4
Thallium	NV	NV	NV	< 0.00005	0.00011	< 0.00005	0.00005	0.00006	< 0.000004	0.00006	0.00007	< 0.00005	< 0.005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005
Vanadium	NV	NV	NV	0.001	0.0045	0.0053	0.0023	0.0044	< 0.00007	0.0005	0.0005	0.0003	0.0005	0.0004	0.0007	0.0002	0.0003	0.0002	0.0003	0.0002
Zinc	5	2.5	1.9	< 0.005	< 0.005	< 0.005	0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005
Field Conductivity (µs/cm)	NV	NV	NV	868	925	817	920	1040	920		685	940	675	980	920	765	750	850	710	1105
Field pH (units)	6.5 - 8.5	NV	NV	6.29	7.15	7.4	7.21	7	7.01		6.9	7.05	7.4	7.24	7.15	7.22	7.18	6.52	7.36	6.94
Field Temperature (°C)	NV	NV	NV	10.49	12	7.7	12.7	7.2	11.3		9.1	8	8.4	11	10.8	9.5	10.5	12.2	8.7	11.5

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Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW1-I	MW1-I	MW1-I	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II
			08-Oct-24	21-Apr-25	08-Oct-25	01-Jun-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23
Alkalinity	500	351	573	631	626	770	Dry	732	Dry	610	Dry	417	Dry	538	Dry	Dry	Dry	Dry	Dry	716
Aluminum	0.1	0.07	0.06	0.08	0.07	0.07		0.17		0.13		0.09		0.1						0.08
Ammonia, Total	NV	NV	0.19	0.07	0.07	1.77		0.68		4.61		4.3		5.31						3
Antimony	0.006	0.002	0.0001	<0.0001	0.0001	< 0.0001		0.0002		0.0002		0.0002		< 0.0001						0.0002
Arsenic	0.01	0.003	0.0003	0.0004	0.0004	0.0023		0.0029		0.0013		0.0015		0.0012						0.0013
Barium	1	0.3	0.21	0.228	0.208	0.218		0.184		0.249		0.206		0.211						0.186
Beryllium	NV	NV	<0.0001	<0.0001	<0.0001	< 0.002		< 0.002		< 0.002		< 0.002		< 0.002						< 0.002
Boron	5	1	0.014	0.014	0.012	0.048		< 0.005		0.09		0.081		0.128						0.024
Cadmium	0.005	0.001	<0.000015	<0.000015	<0.000015	< 0.00002		0.000015		0.000622		< 0.000015		< 0.000015						< 0.000012
Calcium	NV	NV	242	247	223	292		271		244		140		217						233
Chloride	250	150	0.9	0.7	1	3.8		1.6		1.8		2.2		2.2						3.1
Chromium	0.05	0.01	<0.001	<0.001	<0.001	0.0045		< 0.001		0.002		0.001		0.001						< 0.001
Chromium (VI)	NV	NV	<0.01	<0.01	<0.01	-		-		-		-		-						< 0.001
Cobalt	NV	NV	0.0074	0.0082	0.0063	0.029		0.01		0.028		0.016		0.016						0.018
Chemical Oxygen Demand	NV	NV	63	117	77	420		413		191		165		96						290
Conductivity (uS/cm)	NV	NV	1040	1130	1100	1370		1260		1080		785		1030						1300
Copper	1	0.5	0.0005	0.0005	0.0006	0.0004		0.0003		0.0026		0.0007		0.0003						0.0008
Dissolved Organic Carbon	5	4.6	7.7	4	8	56		33.6		19		20.9		17.3						6.9
Flouride	1.5	0.5	<0.1	<0.1	<0.1	0.2		2.9		< 0.1		0.4		< 0.1						4.1
Hardness	500	376	660	673	614	782		735		659		378		582						635
Iron	0.3	0.2	3.01	8.22	2.69	69.1		7.93		82.8		39.5		61.5						24
Lead	0.01	0.003	0.00004	0.00008	0.00004	0.00018		0.00101		0.00115		0.00021		0.00009						0.00004
Magnesium	NV	NV	13.4	13.6	13.8	13		13.9		12		6.79		9.5						12.6
Manganese	0.05	0.03	2.16	2.53	2.08	3.14		2.83		2.48		2.25		1.97						2.28
Mercury	0.001	0.0003	<0.00002	<0.00002	<0.00002	< 0.00002		< 0.00002		< 0.00002		< 0.00002		< 0.00002						< 0.00002
Molybdenum	NV	NV	0.0005	0.0005	0.0004	< 0.0001		0.0003		0.0003		0.0003		0.0004						0.0001
Nickel	NV	NV	0.0022	0.0037	0.0019	< 0.01		< 0.01		< 0.01		< 0.01		< 0.01						< 0.01
Nitrate	10	2.6	0.14	<0.05	1	0.2		< 0.1		< 0.05		< 0.05		< 0.05						0.1
Nitrite	1	0.3	<0.05	<0.05	<0.05	< 0.1		< 0.1		< 0.05		< 0.05		< 0.05						< 0.05
pH (unit)	6.5 - 8.5	NV	7.73	7.13	7.39	6.89		6.96		7.13		7.21		7.35						7.23
Phenols	NV	NV	<0.001	<0.001	<0.001	< 0.001		< 0.001		0.002		< 0.002		< 0.002						< 0.001
Dissolved Phosphorous	NV	NV	<0.1	<0.1	<0.1	< 0.1		< 0.1		< 0.1		< 0.1		< 0.1						< 0.1
Total Phosphorous	NV	NV	0.84	2.4	1.64	0.4		0.63		0.59		0.25		0.16						0.17
Potassium	NV	NV	3.2	2.9	3.5	4		3.2		5.4		4.9		4.7						3.9
Selenium	0.01	0.003	<0.001	<0.001	<0.001	< 0.001		< 0.001		< 0.001		< 0.001		< 0.001						0.001
Silver	NV	NV	<0.0001	<0.0001	<0.0001	< 0.00002		< 0.00002		< 0.00002		< 0.0001		< 0.0001						< 0.0001
Sodium	200	103	2.1	2.1	2.3	5		2.8		5.8		4.2		3.7						2.6
Strontium	NV	NV	0.49	0.505	0.543	0.717		0.618		0.598		0.482		0.493						0.592
Sulphate	500	253	3	4	4	< 1		< 1		< 1		< 1		< 1						< 1
Total Dissolved Solids	500	392	559	606	632	784		747		644		416		569						716
Total Kjeldahl Nitrogen	NV	NV	0.4	0.4	0.4	8.8		7.3		10.4		7.7		8						6.1
Thallium	NV	NV	<0.00005	<0.00005	<0.00005	< 0.00005		0.00007		< 0.00005		< 0.00005		< 0.00005						< 0.00005
Vanadium	NV	NV	0.0001	0.0002	0.0002	0.0016		0.0137		0.0045		0.0004		0.0009						0.0002
Zinc	5	2.5	<0.005	<0.005	<0.005	0.006		< 0.005		0.016		0.005		< 0.005						< 0.005
Field Conductivity (µs/cm)	NV	NV	1068	814	1115	1270		1025		1220		1220		1245						720
Field pH (units)	6.5 - 8.5	NV	8.22	6.04	7.15	6.07		6.9		6.55		6.55		6.78						6.68
Field Temperature (°C)	NV	NV	9	7.2	9.4	12.33		7.5		7.1		7.1		8.9						11.7

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Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW1-II	MW1-II	MW1-II	MW1-II	MW1-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II
			18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	01-Jun-16	18-Oct-16	20-Apr-17	13-Oct-17	15-Apr-18	27-Sep-18	01-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	13-Apr-22	23-Oct-22
Alkalinity	500	351	Dry	Dry	Dry	616	No Sample	226	220	225	223	220	208	206	208	202	206	197	216	233
Aluminum	0.1	0.07				0.09		0.02	0.06	0.02	0.04	0.06	0.05	0.05	0.04	0.05	0.06	0.06	0.04	0.05
Ammonia, Total	NV	NV				4.81		< 0.01	0.03	< 0.01	< 0.01	0.05	0.03	0.04	0.05	0.03	0.01	0.01	0.87	0.01
Antimony	0.006	0.002				0.0002		< 0.0001	0.0003	< 0.0001	< 0.0001	< 0.0001	0.00006	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001
Arsenic	0.01	0.003				0.0011		< 0.0001	0.0002	0.0001	0.0002	0.0002	0.00011	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Barium	1	0.3				0.219		0.106	0.106	0.11	0.107	0.113	0.106	0.093	0.103	0.106	0.111	0.116	0.122	0.14
Beryllium	NV	NV				< 0.0001		< 0.0002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1				0.05		0.015	0.005	< 0.005	0.006	0.006	< 0.005	0.006	0.007	0.006	0.005	0.005	0.054	0.115
Cadmium	0.005	0.001				< 0.000015		< 0.00002	< 0.00002	< 0.000014	< 0.000014	0.000208	0.000006	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	0.000013
Calcium	NV	NV				222		74.9	76.9	77.1	74.7	77.5	70.6	72.4	74	75.1	77.2	79.2	84	93.6
Chloride	250	150				2.2		1	< 0.5	0.7	0.8	< 0.5	1.6	0.8	1.2	1.2	1.4	1.2	6.6	20.8
Chromium	0.05	0.01				< 0.001		0.0021	0.0024	0.003	< 0.001	0.002	0.0016	0.002	0.002	0.002	0.001	0.001	0.001	0.001
Chromium (VI)	NV	NV				< 0.01		-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	NV	NV				0.0102		< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.002	0.012	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chemical Oxygen Demand	NV	NV				219		10	< 5	6	7	< 5	35	18	33	102	< 5	40	< 5	7
Conductivity (uS/cm)	NV	NV				1110		461	449	453	454	442	445	454	449	443	430	448	500	570
Copper	1	0.5				0.0008		0.0001	< 0.0001	0.0004	0.0005	0.0006	0.00071	0.0006	0.0003	0.0018	0.0004	0.0016	0.0006	0.0016
Dissolved Organic Carbon	5	4.6				29.7		0.8	2.7	1.9	1.1	1.6	1.8	2.2	2.7	2.3	1.3	2.6	2	2.9
Flouride	1.5	0.5				< 0.1		0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness	500	376				594		235	242	246	236	245	227	229	232	237	239	247	265	292
Iron	0.3	0.2				16.8		< 0.005	0.031	< 0.005	0.006	0.022	0.006	0.025	< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.007
Lead	0.01	0.003				0.00016		< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	0.00002	< 0.00002	0.00004	< 0.00002	0.00005	< 0.00002	0.00002
Magnesium	NV	NV				9.39		11.7	12.2	13	11.9	12.5	12.4	11.6	11.5	12.1	11.1	11.9	13.3	14.1
Manganese	0.05	0.03				1.89		< 0.001	0.003	< 0.001	< 0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Mercury	0.001	0.0003				< 0.00002		< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	NV	NV				0.0002		0.0004	0.0005	0.0006	0.0006	0.0005	0.00042	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0005
Nickel	NV	NV				0.0053		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	10	2.6				< 0.05		0.9	0.9	0.9	0.97	0.97	1.15	1.05	1.01	1.12	1.45	1.25	1.3	1.44
Nitrite	1	0.3				< 0.05		< 0.1	0.2	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH (unit)	6.5 - 8.5	NV				7.05		7.96	8.05	7.89	8.16	8.09	8.09	7.98	7.95	7.94	7.95	7.94	7.84	7.84
Phenols	NV	NV				0.003		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001
Dissolved Phosphorous	NV	NV				< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Phosphorous	NV	NV				0.24		0.4	0.79	0.71	0.72	0.61	4.39	3.42	3.46	13.7	1.27	2.11	0.88	0.47
Potassium	NV	NV				4.3		2.2	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.4	2.4
Selenium	0.01	0.003				< 0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Silver	NV	NV				< 0.0001		< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	0.00004	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	200	103				3.3		3.9	3.9	3.5	3.6	4	3.9	3.6	3.5	3.6	3.6	3.6	4	4.2
Strontium	NV	NV				0.468		0.186	0.194	0.189	0.173	0.182	0.189	0.173	0.17	0.171	0.18	0.182	0.206	0.222
Sulphate	500	253				2		13	14	15	12	15	15	15	15	15	13	16	28	40
Total Dissolved Solids	500	392				597		246	246	250	239	244	230	229	232	231	232	233	269	315
Total Kjeldahl Nitrogen	NV	NV				12.1		0.1	0.6	0.2	0.1	0.2	0.3	0.3	0.3	0.4	0.1	0.2	0.1	0.2
Thallium	NV	NV				< 0.00005		< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.000004	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	NV				0.0001		0.0012	0.0016	0.0023	0.0018	0.0027	0.00147	0.0015	0.0013	0.0017	0.0014	0.0017	0.0016	0.0016
Zinc	5	2.5				0.005		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV	NV				815		399	410	375	440	510	400		355	450	435	540	425	455
Field pH (units)	6.5 - 8.5	NV				6.2		6.67	7.91	8.05	8.01	7.84	7.18		7.92	7.92	7.88	7.97	7.8	7.8
Field Temperature (°C)	NV	NV				6.9		9.71	12.3	7.5	11	8.8	11		7.9	8.6	7.1	9.3	9.3	10.3

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Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7
			10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	01-Jun-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21
Alkalinity	500	351	248	286	285	298	383	426	190	Dry	171	248	168	Dry	Submerged	Dry	166	Dry	Submerged	246
Aluminum	0.1	0.07	0.03	0.06	0.03	0.09	0.07	0.05	0.02		0.02	0.06	0.05				0.05			0.06
Ammonia, Total	NV	NV	1.71	0.49	0.11	0.14	0.08	0.19	0.07		< 0.01	0.02	0.02				< 0.01			0.09
Antimony	0.006	0.002	< 0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0001	< 0.0001		0.0001	0.0002	0.0002				0.0003			0.0001
Arsenic	0.01	0.003	0.0001	0.0001	0.0001	0.0002	0.0004	0.0008	0.0002		0.0001	0.0002	0.0001				0.0001			0.0002
Barium	1	0.3	0.118	0.169	0.151	0.206	0.249	0.287	0.03		0.023	0.037	0.022				0.024			0.039
Beryllium	NV	NV	< 0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.002		< 0.002	< 0.002	< 0.002				< 0.002			< 0.002
Boron	5	1	0.107	0.236	0.161	0.283	0.461	0.604	0.024		< 0.005	0.017	0.007				0.007			0.014
Cadmium	0.005	0.001	< 0.000010	<0.000015	<0.000015	<0.000015	0.000016	<0.000015	< 0.00002		0.000056	0.000078	0.000045				0.000059			< 0.000015
Calcium	NV	NV	80.7	114	101	137	163	173	74.9		71.1	100	75				72.6			103
Chloride	250	150	20.5	37.9	32.6	48.4	83.3	96.8	1		1	2.9	< 0.5				1.2			3.2
Chromium	0.05	0.01	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0008		0.001	< 0.001	< 0.001				< 0.001			< 0.001
Chromium (VI)	NV	NV	< 0.001	<0.01	<0.01	<0.01	<0.01	<0.01	-		-	-	-				-			-
Cobalt	NV	NV	< 0.005	0.006	0.002	0.0028	0.0045	0.013	< 0.005		< 0.005	< 0.005	< 0.005				< 0.005			< 0.005
Chemical Oxygen Demand	NV	NV	11	25	6	42	48	60	103		15	42	12				15			22
Conductivity (uS/cm)	NV	NV	579	673	682	746	996	1130	372		334	488	349				340			444
Copper	1	0.5	0.0011	0.0009	0.0019	0.0014	0.0009	0.0008	0.0011		0.0026	0.0039	0.003				0.0049			0.0015
Dissolved Organic Carbon	5	4.6	3.8	7.6	7	8.6	9.8	16.4	4.7		4.4	5.5	3.5				4.6			6.7
Flouride	1.5	0.5	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2		< 0.1	< 0.1	< 0.1				< 0.1			< 0.1
Hardness	500	376	258	352	322	427	506	549	195		185	261	196				189			268
Iron	0.3	0.2	< 0.005	0.007	<0.005	0.09	0.105	0.41	0.012		< 0.005	< 0.005	< 0.005				0.006			0.052
Lead	0.01	0.003	< 0.00002	<0.00002	0.00007	0.00007	0.00005	<0.00002	0.00045		0.00025	0.00047	0.00021				0.00038			0.00019
Magnesium	NV	NV	13.8	16.4	17	20.3	23.9	28.5	1.91		1.87	2.69	1.96				1.81			2.56
Manganese	0.05	0.03	0.002	0.02	0.014	0.032	0.069	0.105	0.018		< 0.001	0.001	< 0.001				< 0.001			0.016
Mercury	0.001	0.0003	< 0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00015		< 0.00002	< 0.00002	< 0.00002				< 0.00002			< 0.00002
Molybdenum	NV	NV	0.0005	0.0004	0.0005	0.0004	0.0004	0.0004	< 0.0001		0.0001	< 0.0001	< 0.0001				0.0001			< 0.0001
Nickel	NV	NV	< 0.01	0.0021	0.0015	0.0028	0.0049	0.0057	< 0.01		< 0.01	< 0.01	< 0.01				< 0.01			< 0.01
Nitrate	10	2.6	1.21	0.89	0.51	0.19	<0.05	0.53	0.1		< 0.1	0.21	< 0.05				0.07			< 0.05
Nitrite	1	0.3	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.1		< 0.1	< 0.05	< 0.05				< 0.05			< 0.05
pH (unit)	6.5 - 8.5	NV	7.8	7.53	7.79	7.87	7.49	7.54	7.8		7.83	7.8	8.1				7.88			8.27
Phenols	NV	NV	< 0.001	<0.001	<0.001	<0.001	0.002	0.002	< 0.001		< 0.001	< 0.001	< 0.001				< 0.002			< 0.002
Dissolved Phosphorous	NV	NV	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.1		< 0.1	< 0.1	< 0.1				< 0.1			< 0.1
Total Phosphorous	NV	NV	0.29	0.3	0.54	0.4	0.28	0.31	1.54		0.08	0.48	0.05				0.06			0.26
Potassium	NV	NV	2.5	2.7	2.8	3.1	3.2	3.9	0.5		0.3	0.4	0.2				0.3			0.4
Selenium	0.01	0.003	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001		< 0.001	< 0.001	< 0.001				< 0.001			< 0.001
Silver	NV	NV	< 0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002		< 0.00002	< 0.00002	< 0.00002				< 0.0001			< 0.0001
Sodium	200	103	4.3	6.3	5.6	8.1	13.6	17.1	0.9		0.6	1.6	0.8				0.6			1.2
Strontium	NV	NV	0.219	0.269	0.272	0.31	0.376	0.475	0.145		0.123	0.174	0.122				0.116			0.184
Sulphate	500	253	34	38	29	32	34	35	1		5	3	2				3			3
Total Dissolved Solids	500	392	304	350	354	390	531	612	195		182	259	181				179			260
Total Kjeldahl Nitrogen	NV	NV	2	0.8	0.4	0.6	0.8	1	3.6		0.3	1	0.4				< 0.01			0.9
Thallium	NV	NV	< 0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	< 0.00005		< 0.00005	< 0.00005	< 0.00005				< 0.00005			< 0.00005
Vanadium	NV	NV	0.0015	0.0015	0.0014	0.0014	0.0009	0.0003	0.0003		0.0012	0.0011	0.0013				0.0002			0.0001
Zinc	5	2.5	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.039		0.04	0.045	0.035				0.038			0.042
Field Conductivity (µs/cm)	NV	NV	430	470	623	721	677	1096	326		252	450	430				405			430
Field pH (units)	6.5 - 8.5	NV	7.05	7.77	7.77	8.3	6.66	7.18	6.46		7.82	7.41	7.92				7.93			7.53
Field Temperature (°C)	NV	NV	10.8	8.7	10.1	9.1	7.5	8.8	15.49		6.5	13.6	4.2				5.8			15.3

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 5. Bold, underlined, red text indicates values exceeding threshold.
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Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW7	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II
			13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	01-Jun-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20
Alkalinity	500	351	180	Dry	Submerged	Dry	185	Dry	Dry	Dry	269	296	274	285	289	294	277	293	298	282
Aluminum	0.1	0.07	0.04				0.02				0.02	0.08	0.02	0.07	0.06	0.06	0.05	0.05	0.06	0.06
Ammonia, Total	NV	NV	0.8				0.07				0.03	0.73	< 0.01	0.02	0.07	0.22	0.04	0.04	0.01	< 0.01
Antimony	0.006	0.002	0.0003				0.0003				< 0.0001	0.0003	< 0.0001	< 0.0001	< 0.0001	0.00008	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	0.01	0.003	0.0001				0.0002				0.0001	0.0007	0.0002	0.0002	0.0003	0.00014	0.0001	0.0001	0.0001	0.0001
Barium	1	0.3	0.028				0.022				0.123	0.129	0.129	0.143	0.164	0.164	0.139	0.15	0.161	0.157
Beryllium	NV	NV	< 0.002				<0.0001				< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1	0.015				0.008				0.233	0.261	0.251	0.209	0.193	0.154	0.2	0.178	0.168	0.168
Cadmium	0.005	0.001	0.000063				0.00005				< 0.00002	< 0.00002	< 0.000014	< 0.000014	< 0.000015	< 0.000006	< 0.000015	< 0.000015	< 0.000015	< 0.000015
Calcium	NV	NV	75				68.5				80.4	84.2	83.5	91.4	98.4	93.6	91.6	89.6	103	96.3
Chloride	250	150	1.6				1.8				7.5	8.8	9.3	8.3	11.8	10.2	9.3	9.7	11.1	10.7
Chromium	0.05	0.01	< 0.001				<0.001				0.0014	0.002	0.001	< 0.001	0.001	0.00064	< 0.001	0.001	< 0.001	0.001
Chromium (VI)	NV	NV	-				<0.01				-	-	-	-	-	-	-	-	-	-
Cobalt	NV	NV	< 0.005				0.0001				< 0.005	< 0.005	< 0.005	< 0.005	0.012	0.000152	0.009	< 0.005	< 0.005	< 0.005
Chemical Oxygen Demand	NV	NV	< 5				6				99	8	8	22	11	8	12	< 5	8	< 5
Conductivity (uS/cm)	NV	NV	358				364				572	629	584	609	641	633	632	643	628	608
Copper	1	0.5	0.0051				0.0101				0.0001	< 0.0001	0.0012	0.0007	0.0003	0.00048	0.002	0.0009	0.0022	0.0006
Dissolved Organic Carbon	5	4.6	5				6.9				0.9	1.3	1.5	0.9	1.9	2.1	2.2	2.3	2.3	1.9
Flouride	1.5	0.5	< 0.1				<0.1				0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness	500	376	196				179				272	286	288	309	329	317	309	306	343	323
Iron	0.3	0.2	0.005				0.005				< 0.005	0.091	< 0.005	< 0.005	0.016	0.063	0.01	0.007	< 0.005	< 0.005
Lead	0.01	0.003	0.00033				0.00038				< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00003	0.00002	0.00005	< 0.00002
Magnesium	NV	NV	2.02				1.89				17.3	18.5	19.2	19.5	20.2	20.2	19.4	20	20.8	20.1
Manganese	0.05	0.03	< 0.001				<0.001				< 0.001	0.043	< 0.001	0.001	0.004	0.009	0.003	0.001	< 0.001	< 0.001
Mercury	0.001	0.0003	< 0.00002				<0.00002				< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	NV	NV	0.0001				0.0002				0.0007	0.0009	0.001	0.0007	0.0007	< 0.00004	0.0008	0.0008	0.0005	0.0006
Nickel	NV	NV	< 0.01				0.0012				< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	10	2.6	0.08				<0.05				2.7	2.6	3.2	3.78	3.95	3.5	3.56	3.27	3.7	3.65
Nitrite	1	0.3	< 0.05				<0.05				< 0.1	0.3	< 0.1	< 0.05	< 0.05	0.08	0.08	< 0.05	< 0.05	< 0.05
pH (unit)	6.5 - 8.5	NV	7.74				7.93				8	7.93	7.92	8.08	8.08	7.82	7.95	7.9	7.8	7.84
Phenols	NV	NV	< 0.001				<0.001				< 0.001	0.007	< 0.001	0.002	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Phosphorous	NV	NV	< 0.1				<0.1				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Phosphorous	NV	NV	0.03				0.03				0.4	1.07	0.96	0.51	0.33	0.41	0.38	0.5	0.51	0.22
Potassium	NV	NV	0.3				0.2				3.1	3.7	3.3	3.6	3.7	3.8	3.6	3.7	3.7	3.9
Selenium	0.01	0.003	< 0.001				<0.001				< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0004	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	NV	< 0.0001				<0.0001				< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	200	103	0.8				0.8				11.4	12.9	15.7	11.1	12.4	10.5	12.6	11.4	11.3	12
Strontium	NV	NV	0.128				0.129				0.239	0.259	0.244	0.252	0.27	0.292	0.264	0.254	0.272	0.281
Sulphate	500	253	3				3				14	14	14	11	14	14	17	14	15	16
Total Dissolved Solids	500	392	195				187				308	333	324	316	334	330	319	325	344	328
Total Kjeldahl Nitrogen	NV	NV	0.9				0.4				0.6	1.6	0.2	0.3	0.4	0.7	0.4	0.4	0.2	0.2
Thallium	NV	NV	< 0.00005				<0.00005				< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.000004	< 0.00005	< 0.00005	< 0.00005	< 0.0005
Vanadium	NV	NV	0.0002				0.0002				0.0015	0.002	0.0026	0.002	0.0029	< 0.00007	0.0016	0.0017	0.0017	0.0017
Zinc	5	2.5	0.039				0.032				< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.013
Field Conductivity (µs/cm)	NV	NV	4.3				418				486	505	520	560	680	552	710	465	665	505
Field pH (units)	6.5 - 8.5	NV	8.55				8.4				6.8	7.88	8.47	8.03	8.1	7.98	7.57	8.16	7.66	7.85
Field Temperature (°C)	NV	NV	4.8				7.1				10.82	13.5	7.4	11	9	11	7.6	8.6	9.4	9.5

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Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW10-II	MW11	MW11	MW11	MW11	MW11	MW11	MW11	MW11
			14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	22-Mar-16	01-Jun-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19
Alkalinity	500	351	262	241	282	295	291	288	281	272	280	281	250	565	Dry	232	Dry	248	Dry	211
Aluminum	0.1	0.07	0.06	0.02	0.05	0.06	0.02	0.06	0.02	0.02	0.04	0.03	0.03	0.05		0.03		0.07		0.05
Ammonia, Total	NV	NV	< 0.01	0.02	0.36	0.01	3.16	0.18	0.13	0.18	<0.05	<0.05	0.05	0.04		< 0.01		0.06		0.04
Antimony	0.006	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0005	0.0001	0.0002	0.0001	0.0001	< 0.0001		< 0.0001		0.0001		0.0001
Arsenic	0.01	0.003	0.0003	0.0001	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0008	0.0005		0.0002		0.0004		0.0002
Barium	1	0.3	0.15	0.15	0.152	0.154	0.111	0.129	0.117	0.141	0.131	0.134	0.164	0.286		0.151		0.184		0.113
Beryllium	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.002	< 0.002		< 0.002		< 0.002		< 0.002
Boron	5	1	0.189	0.166	0.18	0.144	0.136	0.126	0.071	0.11	0.088	0.108	0.019	0.05		< 0.005		0.054		0.037
Cadmium	0.005	0.001	< 0.000015	< 0.000015	< 0.000015	< 0.000010	< 0.000010	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015	0.00003	< 0.00002		0.000026		0.000019		< 0.000015
Calcium	NV	NV	93.3	77.4	96.6	95.2	71.7	83.2	76.5	92.1	87	82.9	110	207		101		113		87.8
Chloride	250	150	10.1	11.2	10.8	14.9	12	12.7	10	10.5	10.7	10.7	11.2	11.1		9.7		5.6		5.5
Chromium	0.05	0.01	< 0.001	< 0.001	0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0008	0.0025		0.001		0.001		< 0.001
Chromium (VI)	NV	NV	-	-	-	-	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-		-		-		-
Cobalt	NV	NV	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0002	0.0001	0.0001	0.0001	0.0002	< 0.005	0.009		< 0.005		0.011		0.009
Chemical Oxygen Demand	NV	NV	< 5	< 5	< 5	< 5	9	12	19	24	18	24	14	39		26		32		35
Conductivity (uS/cm)	NV	NV	627	518	628	631	622	586	589	591	606	595	524	1070		486		556		466
Copper	1	0.5	0.003	0.0003	0.0004	0.0009	0.0003	0.0005	0.0009	0.0004	0.0003	0.0007	0.0006	0.0002		0.0029		0.011		0.0063
Dissolved Organic Carbon	5	4.6	3.4	1.8	1.8	2.3	1.5	3	2.8	2.5	1.7	3.9	3.3	5		5.2		12.4		7.3
Flouride	1.5	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.1	0.1		< 0.1		< 0.1		< 0.1
Hardness	500	376	322	281	328	325	260	289	278	321	306	298	291	546		268		305		237
Iron	0.3	0.2	0.008	< 0.005	0.033	0.015	< 0.005	<0.005	<0.005	<0.005	0.006	<0.005	0.036	0.896		0.006		0.031		0.01
Lead	0.01	0.003	0.0001	0.00002	0.00006	0.00005	< 0.00002	<0.00002	0.00003	<0.00002	0.00004	<0.00002	< 0.00002	< 0.00002		< 0.00002		< 0.00002		0.00003
Magnesium	NV	NV	21.6	21.4	21.1	21.2	19.7	19.7	21	22.1	21.6	22.2	3.83	7.06		3.68		5.56		4.17
Manganese	0.05	0.03	< 0.001	< 0.001	0.002	0.001	< 0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.192	0.81		0.149		0.05		0.145
Mercury	0.001	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002		0.00003		< 0.00002		< 0.00002
Molybdenum	NV	NV	0.0009	0.0007	0.0009	0.0007	0.0011	0.0009	0.0011	0.0011	0.0011	0.0009	0.0008	0.0001		0.0005		0.0007		0.0005
Nickel	NV	NV	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0004	0.0008	0.0004	0.0008	0.0008	< 0.01	< 0.01		< 0.01		< 0.01		< 0.01
Nitrate	10	2.6	3.29	3.51	3.38	3.95	3.21	3.4	2.36	2.37	2.41	2.38	0.1	0.1		0.3		3.7		0.58
Nitrite	1	0.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.1	< 0.1		< 0.1		< 0.05		< 0.05
pH (unit)	6.5 - 8.5	NV	7.85	8.05	7.97	7.85	7.93	7.55	7.98	8.07	7.79	7.91	7.49	7.2		7.64		8		7.81
Phenols	NV	NV	0.003	< 0.002	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	< 0.001		< 0.001		< 0.001		< 0.002
Dissolved Phosphorous	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.1	< 0.1		< 0.1		< 0.1		< 0.1
Total Phosphorous	NV	NV	0.17	0.11	0.1	0.06	0.16	0.1	0.07	0.11	0.07	0.16	0.04	0.11		0.08		0.17		0.17
Potassium	NV	NV	4.1	4.2	4	3.9	4.1	3.9	4.1	4.4	4	4.6	2.6	1.1		2.8		5.8		4.2
Selenium	0.01	0.003	< 0.001	< 0.001	0.001	0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	< 0.001		< 0.001		< 0.001		< 0.001
Silver	NV	NV	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002	< 0.00002		< 0.00002		< 0.00002		< 0.0001
Sodium	200	103	13.2	12.1	15.6	10.9	12	10.8	8.1	10.3	9.5	11.5	8.9	14		6		6.5		5
Strontium	NV	NV	0.271	0.283	0.28	0.276	0.255	0.252	0.264	0.261	0.255	0.287	0.225	0.362		0.204		0.257		0.193
Sulphate	500	253	17	16	16	20	20	20	18	17	19	18	8	12		11		8		7
Total Dissolved Solids	500	392	316	287	336	343	314	304	306	307	314	329	296	593		275		294		240
Total Kjeldahl Nitrogen	NV	NV	0.1	0.1	0.5	0.2	8	0.4	0.5	0.4	0.4	0.2	0.4	0.9		0.8		1.5		1.1
Thallium	NV	NV	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0001	< 0.00005		0.0001		< 0.00005		< 0.00005
Vanadium	NV	NV	0.0017	0.0017	0.002	0.0018	0.0017	0.0018	0.0014	0.0013	0.0013	0.0015	0.0024	0.0015		0.0018		0.0021		0.0003
Zinc	5	2.5	< 0.005	< 0.005	< 0.005	0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	< 0.005	< 0.005		< 0.005		< 0.005		< 0.005
Field Conductivity (µs/cm)	NV	NV	680	650	520	490	540	435	591	598	511	597	-	879		420		650		510
Field pH (units)	6.5 - 8.5	NV	7.82	7.55	7.61	7.67	7.42	7.75	7.8	8.39	7.22	7.39	-	6.62		7.4		7.31		7
Field Temperature (°C)	NV	NV	9.9	14	12.8	13	13.5	8.7	10.9	9.4	8	9.2	-	10.91		6.4		7.8		7.7

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Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW11	MW11	MW11	MW11	MW11	MW11	MW11	MW11	MW11	MW11	MW11	MW11	MW11	MW12	MW12	MW12	MW12	MW12
			24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	25-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	01-Jun-16	22-Aug-16	18-Oct-16	20-Apr-17	23-Oct-17
Alkalinity	500	351	Dry	245	Dry	374	Dry	335	Dry	381	Dry	209	Dry	202	Dry	207	363	363	sd, not acce	346
Aluminum	0.1	0.07		0.06		0.1		0.04		0.05		0.02		0.04		0.02	0.05	0.06		0.06
Ammonia, Total	NV	NV		0.01		0.11		0.75		< 0.01		0.13		0.06		< 0.01	0.1	0.07		0.04
Antimony	0.006	0.002		0.0002		0.0002		< 0.0001		0.0001		0.0002		0.0002		< 0.0001	< 0.0001	0.0001		< 0.0001
Arsenic	0.01	0.003		0.0002		0.0003		0.0003		0.0002		0.0003		0.0003		< 0.0001	0.0002	0.0004		0.0003
Barium	1	0.3		0.134		0.228		0.168		0.228		0.107		0.137		0.017	0.048	0.027		0.042
Beryllium	NV	NV		< 0.002		< 0.002		< 0.002		< 0.002		< 0.0001		< 0.0001		< 0.002	< 0.002	< 0.002		< 0.002
Boron	5	1		0.027		0.046		0.036		0.044		0.025		0.022		0.019	0.114	0.11		0.112
Cadmium	0.005	0.001		< 0.000015		0.000018		0.000023		< 0.000010		< 0.000015		< 0.000015		< 0.00002	< 0.00002	< 0.00002		0.000014
Calcium	NV	NV		107		172		141		151		65.8		83.8		82	169	139		138
Chloride	250	150		9.2		9.5		9.3		29.2		6.1		7.9		1.6	16.2	17.5		16.4
Chromium	0.05	0.01		< 0.001		< 0.001		< 0.001		< 0.001		< 0.001		< 0.001		0.0009	0.001	0.0071		< 0.001
Chromium (VI)	NV	NV		-		-		-		< 0.001		< 0.01		< 0.01		-	-	-		-
Cobalt	NV	NV		< 0.005		< 0.005		< 0.005		0.006		0.0001		0.0018		< 0.005	< 0.005	< 0.005		< 0.005
Chemical Oxygen Demand	NV	NV		25		73		47		15		11		18		19	9	9		25
Conductivity (uS/cm)	NV	NV		531		820		701		806		421		421		409	762	765		726
Copper	1	0.5		0.0068		0.0125		0.0047		0.0071		0.0108		0.0093		0.0011	0.0026	0.0012		0.0025
Dissolved Organic Carbon	5	4.6		5.5		10.4		8		7.5		8.3		6.5		3.3	3.8	4.4		4.7
Flouride	1.5	0.5		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		0.1	0.1	0.1		< 0.1
Hardness	500	376		284		459		374		407		178		224		214	402	375		363
Iron	0.3	0.2		0.031		0.476		< 0.005		0.104		0.027		0.297		< 0.005	0.012	0.034		0.014
Lead	0.01	0.003		0.00005		0.00008		0.00009		< 0.00002		0.00002		0.00014		< 0.00002	< 0.00002	< 0.00002		0.00006
Magnesium	NV	NV		3.96		7.01		5.64		6.98		3.28		3.42		2.19	7.63	6.6		4.48
Manganese	0.05	0.03		0.028		0.289		< 0.001		0.422		0.003		0.205		< 0.001	0.015	0.005		0.039
Mercury	0.001	0.0003		< 0.00002		< 0.00002		< 0.00002		< 0.00002		< 0.00002		< 0.00002		< 0.00002	0.00006	< 0.00002		< 0.00002
Molybdenum	NV	NV		0.0005		0.0005		0.0007		0.0005		0.0013		0.0009		< 0.0001	< 0.0001	0.0003		< 0.0001
Nickel	NV	NV		< 0.01		< 0.01		< 0.01		< 0.01		0.0035		0.0039		< 0.01	< 0.01	< 0.01		< 0.01
Nitrate	10	2.6		0.4		0.96		0.22		0.1		0.45		0.58		0.1	0.5	0.2		< 0.05
Nitrite	1	0.3		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05		< 0.1	< 0.1	< 0.1		< 0.05
pH (unit)	6.5 - 8.5	NV		7.85		7.47		7.57		7.62		7.83		7.5		7.83	7.47	7.81		7.73
Phenols	NV	NV		< 0.002		< 0.002		< 0.001		< 0.001		< 0.001		< 0.001		< 0.001	< 0.001	< 0.001		0.002
Dissolved Phosphorous	NV	NV		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1		< 0.1	< 0.1	< 0.1		< 0.1
Total Phosphorous	NV	NV		0.17		0.48		0.27		0.06		0.06		0.05		0.11	0.02	0.11		0.03
Potassium	NV	NV		2.3		3.1		2.1		3.3		3.8		2.9		0.4	1.4	1		0.9
Selenium	0.01	0.003		< 0.001		< 0.001		< 0.001		< 0.001		< 0.001		< 0.001		< 0.001	< 0.001	< 0.001		< 0.001
Silver	NV	NV		< 0.0001		< 0.0001		< 0.0001		< 0.0001		< 0.0001		< 0.0001		< 0.00002	< 0.00002	0.00005		< 0.00002
Sodium	200	103		4.8		6.7		5.6		6.9		1.6		3.2		1.2	13.3	10.8		11
Strontium	NV	NV		0.197		0.33		0.251		0.314		0.207		0.19		0.153	0.344	0.369		0.264
Sulphate	500	253		10		16		9		8		4		5		5	18	18		7
Total Dissolved Solids	500	392		285		440		377		435		217		217		217	446	412		386
Total Kjeldahl Nitrogen	NV	NV		0.7		2.5		1.7		0.6		0.8		0.6		0.4	0.3	1.2		0.4
Thallium	NV	NV		< 0.00005		< 0.00005		0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005	< 0.00005	< 0.00005		< 0.00005
Vanadium	NV	NV		0.0002		0.0003		0.0003		0.0002		0.0002		0.0003		0.0003	0.0021	0.0029		0.001
Zinc	5	2.5		< 0.005		< 0.005		< 0.005		< 0.005		< 0.005		< 0.005		< 0.005	0.019	< 0.005		0.006
Field Conductivity (µs/cm)	NV	NV		560		730		720		450		382		347		360	528	675		620
Field pH (units)	6.5 - 8.5	NV		7.46		7.8		7.13		7.11		7.99		7.01		6.99	7.11	8.33		7.34
Field Temperature (°C)	NV	NV		6.9		9.3		7.7		12		8.2		7.8		8.01	7.8	13		13.5

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Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW12	MW13	MW13
			25-Apr-18	27-Sep-18	16-Apr-19	24-Apr-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	01-Jun-16	18-Oct-16
Alkalinity	500	351	sd, not acc	Dry	175	370	156	325	162	268	182	370	183	Dry	198	Dry	168	Dry	189	229
Aluminum	0.1	0.07			0.05	0.08	0.05	0.08	0.05	0.06	0.04	0.08	0.02		0.02		0.04		0.02	0.05
Ammonia, Total	NV	NV			0.02	0.14	< 0.01	< 0.01	0.24	0.05	0.84	0.12	3.64		0.07		<0.05		0.02	0.03
Antimony	0.006	0.002			< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001		<0.0001		<0.0001		< 0.0001	0.0003
Arsenic	0.01	0.003			< 0.0001	0.0002	< 0.0001	< 0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001		<0.0001		<0.0001		0.0001	0.0002
Barium	1	0.3			0.018	0.045	0.018	0.037	0.019	0.027	0.023	0.049	0.016		0.018		0.018		0.027	0.043
Beryllium	NV	NV			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		<0.0001		<0.0001		< 0.002	< 0.002
Boron	5	1			< 0.005	0.158	< 0.005	0.115	< 0.005	0.025	< 0.005	0.134	0.005		<0.005		<0.005		0.015	0.011
Cadmium	0.005	0.001			< 0.000015	0.000016	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000010	< 0.000010		<0.000015		<0.000015		< 0.00002	< 0.00002
Calcium	NV	NV			72.9	152	71.1	140	75.7	108	76.5	152	61.9		69.1		68		74.4	103
Chloride	250	150			1.2	22.6	1.3	18	1.6	4.9	1.6	28.5	1.4		1.3		1.5		6.6	24.2
Chromium	0.05	0.01			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		<0.001		<0.001		0.0009	0.0015
Chromium (VI)	NV	NV			-	-	-	-	-	-	-	-	-		< 0.01		< 0.01		-	-
Cobalt	NV	NV			0.007	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		0.0001		0.0001		< 0.005	< 0.005
Chemical Oxygen Demand	NV	NV			5	10	14	7	8	6	< 5	5	29		7		12		30	5
Conductivity (uS/cm)	NV	NV			361	809	326	704	350	489	358	781	351		374		317		394	529
Copper	1	0.5			0.001	0.0021	0.0063	0.002	0.003	0.002	0.0031	0.0032	0.0012		0.0028		0.0008		< 0.0001	< 0.0001
Dissolved Organic Carbon	5	4.6			2.8	5.5	3.8	4.9	4.8	5.8	3.5	4.8	4.3		3.4		4.1		3.4	3.4
Flouride	1.5	0.5			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		<0.1		<0.1		0.1	0.1
Hardness	500	376			189	406	184	369	197	282	198	407	161		180		176		195	270
Iron	0.3	0.2			< 0.005	0.161	0.005	< 0.005	< 0.005	0.053	0.017	0.006	0.035		<0.005		0.007		< 0.005	0.011
Lead	0.01	0.003			0.00003	0.00044	0.00005	0.00002	0.00006	0.00008	< 0.0002	0.00004	0.00007		0.00007		0.00004		< 0.00002	< 0.00002
Magnesium	NV	NV			1.64	6.34	1.63	4.67	1.82	2.95	1.76	6.45	1.62		1.72		1.51		2.16	2.97
Manganese	0.05	0.03			< 0.001	0.072	< 0.001	0.002	< 0.001	0.015	0.001	0.048	0.001		<0.001		<0.001		< 0.001	0.017
Mercury	0.001	0.0003			< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002		<0.00002		<0.00002		< 0.00002	< 0.00002
Molybdenum	NV	NV			< 0.0001	< 0.0001	0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001		<0.0001		<0.0001		< 0.0001	< 0.0001
Nickel	NV	NV			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		0.001		0.0008		< 0.01	< 0.01
Nitrate	10	2.6			0.08	0.16	0.05	0.21	< 0.05	< 0.05	0.07	0.3	< 0.05		<0.05		<0.05		0.2	0.1
Nitrite	1	0.3			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		<0.05		<0.05		< 0.1	< 0.1
pH (unit)	6.5 - 8.5	NV			7.95	7.63	7.95	7.56	7.81	8.33	7.63	7.48	7.71		7.92		7.51		7.96	7.94
Phenols	NV	NV			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001		<0.001		<0.001		< 0.001	0.005
Dissolved Phosphorous	NV	NV			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		<0.1		<0.1		< 0.1	< 0.1
Total Phosphorous	NV	NV			0.02	0.02	0.07	0.02	0.03	0.04	< 0.01	< 0.01	0.04		0.04		0.04		0.6	0.14
Potassium	NV	NV			0.3	1.3	0.3	0.8	0.3	0.5	0.2	1.2	0.3		0.2		0.1		0.3	0.5
Selenium	0.01	0.003			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001		<0.001		<0.001		< 0.001	0.001
Silver	NV	NV			< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001		<0.0001		<0.0001		< 0.00002	< 0.00002
Sodium	200	103			0.6	13.6	0.6	9.5	0.8	2.2	0.7	9.7	0.6		0.6		0.7		2.1	4.8
Strontium	NV	NV			0.111	0.308	0.102	0.264	0.121	0.202	0.118	0.311	0.112		0.122		0.097		0.142	0.205
Sulphate	500	253			3	15	3	14	4	5	3	18	3		3		4		3	7
Total Dissolved Solids	500	392			184	433	172	382	181	284	194	438	178		193		163		203	280
Total Kjeldahl Nitrogen	NV	NV			0.2	0.4	0.2	0.3	0.2	0.3	12	1.4	3.8		0.4		0.3		0.6	0.5
Thallium	NV	NV			< 0.00005	< 0.00005	< 0.00005	< 0.005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005		<0.00005		<0.00005		< 0.00005	< 0.00005
Vanadium	NV	NV			< 0.0001	0.0004	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001		<0.0001		<0.0001		0.0002	0.0006
Zinc	5	2.5			< 0.005	0.008	< 0.005	0.008	< 0.005	< 0.005	< 0.005	0.006	< 0.005		<0.005		0.005		< 0.005	< 0.005
Field Conductivity (µs/cm)	NV	NV			380	625	370	595	440	480	315	590	310		376		312		346	470
Field pH (units)	6.5 - 8.5	NV			7.95	7.2	7.78	7.22	8.13	7.6	8.26	7.42	7.84		8.08		7.24		7.01	7.6
Field Temperature (°C)	NV	NV			5.3	9.4	6.1	7.8	7.6	12.6	6.2	10.5	7.9		6.9		6		8.21	9.4

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Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13	MW13
			20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25
Alkalinity	500	351	166	211	158	237	139	216	165	201	168	225	172	221	183	241	178	234	161	226
Aluminum	0.1	0.07	0.06	0.06	0.06	0.06	0.04	0.06	0.05	0.06	0.05	0.06	0.04	0.08	0.02	0.07	0.02	0.04	0.04	0.04
Ammonia, Total	NV	NV	< 0.01	0.02	0.03	0.02	0.04	0.03	0.01	0.01	0.07	0.04	0.58	0.03	1.68	0.37	0.13	0.17	<0.05	0.16
Antimony	0.006	0.002	< 0.0001	< 0.0001	< 0.0001	0.00005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001
Arsenic	0.01	0.003	0.0002	0.0003	< 0.0001	0.00012	0.0001	0.0001	< 0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	<0.0001
Barium	1	0.3	0.036	0.039	0.025	0.041	0.017	0.044	0.024	0.041	0.03	0.05	0.027	0.09	0.027	0.094	0.027	0.097	0.025	0.094
Beryllium	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron	5	1	< 0.005	0.014	0.011	0.012	0.006	0.013	0.01	0.011	0.01	0.012	0.006	0.016	0.009	0.013	<0.005	0.017	0.005	0.018
Cadmium	0.005	0.001	0.000016	< 0.000014	< 0.000015	0.00001	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000010	< 0.000010	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015
Calcium	NV	NV	71.7	88.1	71.6	97.8	58.8	95.2	71.9	94.5	79	105	73.9	122	65.5	120	67.1	138	70.7	118
Chloride	250	150	4.1	7.1	4.4	25	3.2	14.1	4.3	20.5	6.8	20.9	7.7	119	15.6	133	9.2	92.1	6.5	91.6
Chromium	0.05	0.01	< 0.001	< 0.001	< 0.001	0.00017	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (VI)	NV	NV	-	-	-	-	-	-	-	-	-	-	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	NV	NV	< 0.005	< 0.005	0.006	0.000027	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0003	0.0001	0.0002	<0.0001	0.0002
Chemical Oxygen Demand	NV	NV	16	30	11	< 5	19	6	39	13	12	8	11	16	14	22	15	20	15	12
Conductivity (uS/cm)	NV	NV	340	433	338	541	298	489	346	469	381	466	365	729	395	812	377	753	335	732
Copper	1	0.5	0.0002	0.0006	0.0003	0.00146	0.0015	0.0005	0.0017	0.0003	0.0019	0.0003	0.0003	0.0004	0.0002	0.0006	0.0005	0.0006	0.0003	0.0004
Dissolved Organic Carbon	5	4.6	4.3	5.2	3.7	3.8	4.8	4.2	4.2	5.2	5.4	6.3	4.2	2	2.9	3.9	5.5	3.8	4.7	4.1
Flouride	1.5	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness	500	376	188	230	187	257	154	249	188	247	207	274	194	319	172	314	176	362	185	311
Iron	0.3	0.2	0.153	0.059	0.017	0.005	0.007	0.01	0.006	< 0.005	0.011	0.027	0.005	0.006	0.008	<0.005	<0.005	<0.005	0.014	<0.005
Lead	0.01	0.003	0.00012	0.00011	< 0.00002	0.00006	0.00007	0.00009	0.00005	< 0.00002	0.00006	0.00005	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002	0.00006	<0.00002
Magnesium	NV	NV	2.04	2.47	2.06	3.13	1.66	2.73	1.98	2.64	2.22	2.89	2.13	3.52	1.98	3.48	2.09	3.91	1.95	3.88
Manganese	0.05	0.03	0.074	0.034	0.006	0.019	0.002	0.013	0.001	< 0.001	0.002	0.007	0.001	0.002	0.002	0.001	<0.001	0.002	0.002	0.001
Mercury	0.001	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Molybdenum	NV	NV	< 0.0001	< 0.0001	< 0.0001	< 0.00004	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	0.0007	<0.0001	0.0001	<0.0001
Nickel	NV	NV	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0003	0.0006	0.0003	0.0009	0.001
Nitrate	10	2.6	< 0.1	0.09	0.09	0.1	< 0.05	0.26	0.09	0.2	0.09	0.09	0.08	0.46	0.07	0.49	0.06	0.25	0.07	0.14
Nitrite	1	0.3	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
pH (unit)	6.5 - 8.5	NV	7.88	7.98	8.15	7.75	8	7.78	7.96	7.82	7.82	8.33	7.58	7.63	7.73	7.61	7.95	8	7.58	7.71
Phenols	NV	NV	< 0.001	0.004	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Phosphorous	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Phosphorous	NV	NV	0.19	0.24	0.16	0.08	0.09	0.1	0.31	0.11	0.13	0.13	0.08	0.08	0.11	0.11	0.18	0.1	0.07	0.13
Potassium	NV	NV	0.3	0.4	0.3	0.5	0.3	0.5	0.4	0.4	0.4	0.4	0.3	0.5	0.4	0.5	0.2	0.6	0.3	0.7
Selenium	0.01	0.003	< 0.001	< 0.001	< 0.001	0.0003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	0.002	<0.001	<0.001	<0.001	<0.001
Silver	NV	NV	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	200	103	1.5	2.3	2	5.2	1.9	3.5	1.5	4.5	1.9	3.6	1.9	8.8	2	10	2.2	10.2	1.7	13.9
Strontium	NV	NV	0.127	0.159	0.12	0.207	0.1	0.175	0.118	0.177	0.137	0.199	0.132	0.246	0.141	0.266	0.142	0.287	0.122	0.313
Sulphate	500	253	5	3	1	6	2	6	3	7	4	4	2	9	2	10	3	8	3	10
Total Dissolved Solids	500	392	185	230	176	280	152	252	182	250	195	272	192	396	198	427	194	394	172	374
Total Kjeldahl Nitrogen	NV	NV	0.7	0.7	0.4	0.4	0.5	0.4	0.9	0.4	0.3	0.4	0.8	0.4	1.8	0.5	0.8	0.6	0.3	0.6
Thallium	NV	NV	< 0.00005	< 0.00005	< 0.00005	< 0.000004	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Vanadium	NV	NV	0.001	0.0006	0.0011	< 0.00007	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc	5	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005	<0.005	0.005	<0.005
Field Conductivity (µs/cm)	NV	NV	285	405	420	470	340	390	360	460	460	510	310	510	305	490	405	710	297	719
Field pH (units)	6.5 - 8.5	NV	8.45	7.82	7.77	7.64	8.13	7.68	7.88	7.83	8.18	7.28	8.1	7.6	7.25	7.75	7.78	8.21	7.36	7.48
Field Temperature (°C)	NV	NV	6.8	12.2	5	9	4	8.2	5.5	7.7	6.4	9.7	8.1	9.3	8.8	8.8	7.8	9.2	5.7	8

- Notes:
1. All results are expressed in mg/L unless otherwise stated.
 2. ODWQS means Ontario Drinking Water Quality Standards.
 3. RUC means Reasonable Use Criteria.
 4. Bold text and shading indicates values exceeding ODV.
 5. Bold, underlined, red text indicates values exceeding threshold.
 6. Bold & red text indicate trigger parameter exceedance.
 7. NV / "-" indicates no value.

Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III
			18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25
Alkalinity	500	351	212	225	215	220	221	208	207	202	210	194	184	210	215	216	232	228	211	216
Aluminum	0.1	0.07	0.11	0.03	0.05	0.05	0.06	0.05	0.05	0.05	0.06	0.06	0.02	0.04	0.05	0.02	0.01	0.07	0.02	0.14
Ammonia, Total	NV	NV	0.08	< 0.01	0.03	0.09	0.02	0.03	0.04	0.02	0.04	0.07	0.03	0.13	0.01	0.82	2.23	<0.05	0.06	0.19
Antimony	0.006	0.002	0.0004	< 0.0001	< 0.0001	< 0.0001	0.00005	< 0.0001	0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	<0.0001	<0.0001	0.0001
Arsenic	0.01	0.003	0.0002	0.0002	0.0002	< 0.0001	0.00013	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Barium	1	0.3	0.097	0.112	0.088	0.088	0.087	0.077	0.084	0.082	0.084	0.087	0.076	0.082	0.085	0.069	0.083	0.076	0.086	0.085
Beryllium	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001	<0.0001	<0.0001
Boron	5	1	0.006	< 0.005	0.007	0.006	0.005	0.007	0.008	0.005	0.005	0.005	< 0.005	0.005	< 0.005	< 0.005	0.006	<0.005	<0.005	<0.005
Cadmium	0.005	0.001	< 0.00002	< 0.000014	< 0.000014	< 0.000015	< 0.000006	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000010	< 0.000010	<0.000015	<0.000015	<0.000015	<0.000015
Calcium	NV	NV	80.2	85.1	75.4	77.6	70.4	74	72.6	73.8	76	78	66.1	75.4	75.7	61	71.7	67.2	78.4	77.8
Chloride	250	150	11.1	16	10.5	11.3	11.1	9.2	11.5	10.1	11.2	10.5	11.4	9.3	18.1	9	13.4	9.3	10.9	8.3
Chromium	0.05	0.01	0.0028	0.002	< 0.001	0.003	0.00239	0.002	0.003	0.002	0.002	0.002	< 0.001	0.002	0.002	0.001	0.002	0.002	0.002	0.002
Chromium (VI)	NV	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.001	<0.01	<0.01	<0.01	<0.01
Cobalt	NV	NV	< 0.005	< 0.005	< 0.005	< 0.005	0.000077	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0002	0.0003	0.0002	0.0003
Chemical Oxygen Demand	NV	NV	< 5	128	87	63	42	34	360	74	161	45	50	< 5	21	37	12	21	94	79
Conductivity (uS/cm)	NV	NV	459	493	466	475	460	466	465	430	450	454	385	454	470	440	458	457	439	451
Copper	1	0.5	< 0.0001	0.0012	0.0003	0.0007	0.00078	0.0011	0.0015	0.0018	0.0008	0.0015	0.0005	0.0005	0.0005	0.0005	0.0006	0.0008	0.0007	0.0009
Dissolved Organic Carbon	5	4.6	1	1.8	0.3	1.2	1.6	1.9	1.9	1.8	1.5	2.5	1.9	1.7	0.6	1.5	2.2	2.4	2	1.6
Flouride	1.5	0.5	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1
Hardness	500	376	250	261	242	250	230	239	232	235	244	251	219	242	241	198	232	219	251	247
Iron	0.3	0.2	0.083	< 0.005	< 0.005	< 0.005	0.037	< 0.005	0.009	0.019	< 0.005	0.009	< 0.005	0.014	0.005	< 0.005	0.009	0.046	<0.005	0.16
Lead	0.01	0.003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002	< 0.00002	0.00005	0.00005	0.00005	0.00002	0.00002	0.00003	< 0.00002	< 0.00002	<0.00002	0.00006	<0.00002	0.00014
Magnesium	NV	NV	12.2	11.7	13	13.7	13.2	13.2	12.3	12.3	13.2	13.6	13.1	13	12.7	11.1	12.8	12.5	13.4	12.8
Manganese	0.05	0.03	0.046	0.009	0.005	< 0.001	0.002	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	<0.001	0.002	<0.001	0.008
Mercury	0.001	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Molybdenum	NV	NV	0.0012	0.0004	0.0004	0.0003	< 0.00004	0.0003	0.0004	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0007	0.0004	0.0008	0.0004	0.0003
Nickel	NV	NV	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0007	0.0007	0.0002	0.0008
Nitrate	10	2.6	0.4	0.4	0.32	0.37	0.39	0.34	0.36	0.38	0.31	0.33	0.3	0.34	0.36	0.33	0.36	0.33	0.34	0.36
Nitrite	1	0.3	0.2	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05	<0.05
pH (unit)	6.5 - 8.5	NV	8.06	7.95	8.14	8.21	7.92	8.09	8.03	7.92	7.96	8	8.03	7.92	7.91	7.94	8.12	8.03	8.04	7.83
Phenols	NV	NV	< 0.001	< 0.002	0.003	< 0.001	0.004	< 0.002	< 0.002	0.015	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Phosphorous	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	<0.1
Total Phosphorous	NV	NV	11.5	7.89	13.5	13.2	4.2	5.78	30.2	13.3	10.7	4.1	4.79	1.93	1.51	2.15	1.3	0.93	4.14	6.56
Potassium	NV	NV	2.4	1.5	2.1	2.2	2.3	2.1	2	2	2.1	2.2	2.3	2	2	2	2.1	2	2.2	1.8
Selenium	0.01	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001
Silver	NV	NV	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	200	103	5	5	4	4.3	4.4	4.2	4	4.1	4.4	4.5	4.4	4.6	4.3	4.2	4.7	4.7	4.9	4.6
Strontium	NV	NV	0.192	0.187	0.177	0.182	0.19	0.181	0.168	0.163	0.184	0.185	0.178	0.18	0.178	0.165	0.181	0.184	0.178	0.174
Sulphate	500	253	11	10	9	10	11	10	10	9	10	10	10	10	11	9	10	8	8	8
Total Dissolved Solids	500	392	252	266	243	252	245	238	237	232	243	235	218	241	253	226	237	236	227	233
Total Kjeldahl Nitrogen	NV	NV	1	0.9	1.7	0.5	0.4	0.4	1.2	0.4	0.5	0.2	0.4	0.3	0.2	0.9	2	0.2	0.6	1.4
Thallium	NV	NV	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.000004	< 0.00005	< 0.00005	< 0.00005	< 0.005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Vanadium	NV	NV	0.0016	0.0027	0.0019	0.0026	< 0.00007	0.0022	0.002	0.0021	0.0024	0.0023	0.0024	0.0026	0.0023	0.0023	0.0021	0.0023	0.0023	0.0025
Zinc	5	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	<0.005	<0.005	<0.005	<0.005
Field Conductivity (µs/cm)	NV	NV	415	403	410	510	405	460	380	505	460	540	480	390	390	370	365	465	437	347
Field pH (units)	6.5 - 8.5	NV	7.7	7.72	7.35	7.74	7.85	7.45	7.73	7.85	7.25	8.04	7.81	7.93	7.95	7.15	7.7	8.04	7.87	7.02
Field Temperature (°C)	NV	NV	12.6	7.5	11.1	7.7	10.3	7.9	7.9	6.6	7.7	8.3	9.6	7.4	9.1	9.9	9.1	9.3	9.7	7.2

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Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW16-III (Dup)	MW16-III	MW16-III (Dup)	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17	MW17
			21-Apr-25	08-Oct-25	08-Oct-25	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	23-Sep-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23
Alkalinity	500	351	218	230	231	2540	2540	2680	2500	2390	2440	2420	2230	2170	2150	2040	2450	1980	2460	2080
Aluminum	0.1	0.07	0.13	0.02	0.02	0.11	0.15	0.42	0.19	0.17	0.17	0.18	0.19	0.18	0.19	0.15	0.14	0.19	0.14	0.13
Ammonia, Total	NV	NV	0.15	0.35	0.12	212	176	116	180	162	173	212	169	160	189	187	22.2	210	235	260
Antimony	0.006	0.002	<0.0001	<0.0001	<0.0001	0.0017	0.001	<0.0001	0.0006	0.00084	0.0011	0.0004	0.0007	0.0008	0.0008	0.001	0.0008	0.0009	0.0011	0.0008
Arsenic	0.01	0.003	0.0002	0.0001	0.0001	0.0045	0.0067	0.0004	0.0041	0.00204	0.0019	0.0011	0.0017	0.0018	0.0017	0.005	0.0022	0.0019	0.0024	0.0021
Barium	1	0.3	0.085	0.085	0.083	0.38	0.526	0.576	0.62	0.522	0.703	0.711	0.647	0.373	0.6	0.435	0.694	0.621	0.367	0.571
Beryllium	NV	NV	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001
Boron	5	1	0.006	<0.005	0.008	5.38	9.49	9.29	9.67	8.19	10.4	10.2	10.2	9.53	10	11.5	10.5	8.06	7.9	7.68
Cadmium	0.005	0.001	<0.000015	<0.000015	<0.000015	<0.00002	0.000025	<0.000014	0.00002	0.000011	<0.000029	<0.000059	<0.000059	<0.000059	<0.000059	0.000391	<0.000059	<0.000059	<0.000059	<0.000030
Calcium	NV	NV	77.6	71.9	69.2	467	478	469	473	393	496	477	535	464	470	477	467	408	428	397
Chloride	250	150	8.3	10.6	10.5	390	337	259	396	355	348	345	319	319	306	350	417	487	450	340
Chromium	0.05	0.01	0.003	0.002	0.002	0.0331	0.007	0.011	0.008	0.00766	0.008	0.015	0.011	0.005	0.007	0.002	0.007	0.006	0.003	0.006
Chromium (VI)	NV	NV	<0.01	<0.01	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.01
Cobalt	NV	NV	0.0004	0.0003	0.0003	0.01	0.006	0.005	0.008	0.00376	0.006	0.007	0.007	0.008	0.007	0.016	0.011	0.007	0.025	0.0077
Chemical Oxygen Demand	NV	NV	77	63	71	1210	1170	767	637	788	713	613	554	470	738	1090	972	830	802	657
Conductivity (uS/cm)	NV	NV	446	471	471	5490	5220	5340	5330	5250	5520	5420	4940	4810	5090	5040	5530	5510	5720	5300
Copper	1	0.5	0.0011	0.0006	0.0004	0.0019	0.0026	0.0001	0.0021	0.00038	0.0002	<0.0003	0.004	0.0009	0.0006	0.0229	0.0013	0.0015	0.0004	0.0039
Dissolved Organic Carbon	5	4.6	1.6	3.1	3.3	587	130	27.5	120	117	107	32.4	105	124	109	123	90.2	78	34.3	104
Flouride	1.5	0.5	<0.1	<0.1	<0.1	<1	<1	<0.1	<1	<1	<1	<1	<1	<1	<0.1	<1	<1	<3	<1	<0.7
Hardness	500	376	246	235	227	1460	1520	1490	1500	1250	1560	1530	1640	1440	1470	1510	1480	1310	948	1280
Iron	0.3	0.2	0.168	<0.005	<0.005	19.9	12.1	39.9	38.8	28.3	28.1	43	31.9	0.735	32.7	0.348	34.7	32.9	0.47	3.91
Lead	0.01	0.003	0.00014	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00008	<0.00009	<0.0002	<0.0002	<0.0002	<0.0002	0.0126	<0.0002	<0.0002	0.00031	<0.0009
Magnesium	NV	NV	12.7	13.3	13.2	70.2	78.1	76.4	76.9	66.1	78	81.9	74.1	67.8	71.6	76.4	75.1	71.1	78	70.4
Manganese	0.05	0.03	0.008	<0.001	<0.001	2.67	2.39	2.32	2.02	1.79	1.9	1.98	1.97	1.79	1.75	1.45	1.75	1.46	1.48	1.48
Mercury	0.001	0.0003	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00004	<0.00002	<0.00002	<0.00002	<0.00002
Molybdenum	NV	NV	0.0003	0.0003	0.0003	0.0006	0.0003	<0.0001	0.0003	<0.00004	0.0005	<0.0004	<0.0004	<0.0004	0.0005	0.0013	<0.0004	0.0011	0.0007	0.0002
Nickel	NV	NV	0.0004	0.0006	0.0006	0.02	0.01	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.04	0.0261
Nitrate	10	2.6	0.34	0.21	0.22	<1	<1	<0.05	<0.5	<0.5	<0.5	0.62	<0.5	0.78	<0.05	<0.5	0.54	<1	<0.5	<0.40
Nitrite	1	0.3	<0.05	<0.05	<0.05	<1	<1	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<1	<0.5	<0.40
pH (unit)	6.5 - 8.5	NV	7.96	7.89	7.94	7.06	7.01	7.05	7.43	7.45	7.48	7.34	7.46	7.31	7.05	7.58	7.23	7.05	7.27	7.45
Phenols	NV	NV	<0.001	<0.001	<0.001	0.038	0.126	0.069	0.03	0.044	0.01	0.01	<0.002	0.02	0.015	0.012	0.011	0.017	0.015	0.014
Dissolved Phosphorous	NV	NV	<0.1	<0.1	<0.1	0.1	<0.1	0.4	0.3	0.3	0.2	0.4	0.3	<0.1	0.3	<0.1	0.3	0.3	<0.1	<0.1
Total Phosphorous	NV	NV	4.73	2.72	2.36	11.4	1.3	0.96	1.75	2.96	2.55	1.96	1.62	1.15	2.74	5.27	3.46	1.86	1.06	1.57
Potassium	NV	NV	1.8	2.3	2.3	147	150	180	192	174	197	204	162	154	160	200	233	193	231	163
Selenium	0.01	0.003	<0.001	<0.001	<0.001	0.01	0.005	<0.001	0.003	0.0049	0.006	0.007	0.006	0.004	0.006	0.007	0.01	<0.02	<0.002	<0.001
Silver	NV	NV	<0.0001	<0.0001	<0.0001	0.00004	<0.00002	<0.00002	0.00101	0.00009	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	0.0015	<0.0001
Sodium	200	103	4.6	5.3	5.3	395	386	361	377	324	387	387	347	319	348	366	402	376	432	381
Strontium	NV	NV	0.173	0.196	0.196	2.28	2.31	2.36	2.61	2.47	2.85	2.77	2.77	2.68	2.71	2.71	2.67	2.36	2.32	2.41
Sulphate	500	253	8	8	8	<10	26	9	<10	<10	12	31	14	11	13	22	<10	<30	22	35
Total Dissolved Solids	500	392	230	251	249	3300	2990	3219	3288	2993	3233	3295	3040	2847	2907	2960	3130	3045	3118	3000
Total Kjeldahl Nitrogen	NV	NV	1.5	0.5	0.3	257	66.5	210	185	169	191	207	184	155	196	210	231	222	260	280
Thallium	NV	NV	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000004	<0.00005	<0.00005	<0.00005	<0.005	0.00011	0.00011	<0.00005	0.0001	0.00009	0.00012
Vanadium	NV	NV	0.0027	0.0023	0.0022	0.0115	0.0242	0.0011	0.0107	<0.00007	0.0071	0.0021	0.0054	0.0102	0.0118	0.017	0.0105	0.0114	0.0109	0.013
Zinc	5	2.5	<0.005	<0.005	<0.005	<0.005	<0.005	0.012	<0.005	0.036	0.02	0.016	0.025	<0.005	<0.005	0.031	<0.005	<0.005	0.005	<0.005
Field Conductivity (µs/cm)	NV	NV	347	471	471	>40000	>4000	>4000	3700	>4000	5440	2590	5380	5102	3300	5450	3360	2910	2810	2320
Field pH (units)	6.5 - 8.5	NV	7.02	7.76	7.76	6.71	6.77	6.69	6.76	6.92	6.87	6.8	6.91	6.55	7.01	7.1	7	6.85	6.78	7.12
Field Temperature (°C)	NV	NV	7.2	9.6	9.6	16.3	9.1	14.1	10.8	12.3	12.1	10.6	10.4	12.2	13.6	14.2	8.8	13.8	14	11.5

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Overburden Ground Water Quality Data

Parameters	ODWQS	RUC	MW17	MW17 (DUP)	MW17	MW17	MW17	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW201
			16-Apr-24	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	04-Nov-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25
Alkalinity	500	351	2480	2580	2460	2480	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Obstructed	Dry
Aluminum	0.1	0.07	0.19	0.15	0.18	0.16														
Ammonia, Total	NV	NV	254	254	264	197														
Antimony	0.006	0.002	0.0007	0.0007	0.0004	0.0005														
Arsenic	0.01	0.003	0.0023	0.0024	0.0023	0.002														
Barium	1	0.3	0.654	0.628	0.737	0.684														
Beryllium	NV	NV	<0.0001	<0.0001	<0.0001	<0.0001														
Boron	5	1	8.43	8.15	8.74	9.21														
Cadmium	0.005	0.001	<0.000030	<0.000030	<0.000030	<0.000030														
Calcium	NV	NV	439	428	408	481														
Chloride	250	150	342	375	305	326														
Chromium	0.05	0.01	0.008	0.008	0.008	0.006														
Chromium (VI)	NV	NV	<0.01	<0.01	<0.01	<0.01														
Cobalt	NV	NV	0.0078	0.008	0.0083	0.0069														
Chemical Oxygen Demand	NV	NV	605	675	611	533														
Conductivity (uS/cm)	NV	NV	5500	5550	5100	5000														
Copper	1	0.5	0.0029	0.0029	0.0004	<0.0002														
Dissolved Organic Carbon	5	4.6	152	175	172	18														
Flouride	1.5	0.5	<1.8	<0.7	<1.8	<0.7														
Hardness	500	376	1430	1400	1360	1500														
Iron	0.3	0.2	40.7	33.6	44.2	32.3														
Lead	0.01	0.003	0.00016	0.00016	0.0001	<0.00009														
Magnesium	NV	NV	81.6	79.2	81.6	72.4														
Manganese	0.05	0.03	1.52	1.48	1.76	1.74														
Mercury	0.001	0.0003	<0.00002	<0.00002	<0.00002	<0.00002														
Molybdenum	NV	NV	0.0003	0.0003	0.0004	0.0004														
Nickel	NV	NV	0.0285	0.0292	0.0216	0.0208														
Nitrate	10	2.6	<1.00	<0.40	<1.00	<0.40														
Nitrite	1	0.3	<1.00	<0.40	<1.00	<0.40														
pH (unit)	6.5 - 8.5	NV	7.46	7.44	7.4	7.01														
Phenols	NV	NV	0.013	0.014	0.014	0.016														
Dissolved Phosphorous	NV	NV	0.3	0.2	0.3	0.2														
Total Phosphorous	NV	NV	1.05	1.46	1.01	1.01														
Potassium	NV	NV	200	193	184	146														
Selenium	0.01	0.003	<0.001	<0.001	<0.001	0.005														
Silver	NV	NV	<0.0001	<0.0001	<0.0001	<0.0001														
Sodium	200	103	433	420	401	341														
Strontium	NV	NV	2.66	2.58	2.45	2.51														
Sulphate	500	253	13	12	<4	27														
Total Dissolved Solids	500	392	3120	3150	2890	2830														
Total Kjeldahl Nitrogen	NV	NV	280	278	289	232														
Thallium	NV	NV	<0.00005	<0.00005	<0.00005	<0.00005														
Vanadium	NV	NV	0.0109	0.0117	0.0113	0.0091														
Zinc	5	2.5	<0.005	<0.005	<0.005	0.005														
Field Conductivity (µs/cm)	NV	NV	3683	363	5770	3058														
Field pH (units)	6.5 - 8.5	NV	6.59	6.59	6.4	6.3														
Field Temperature (°C)	NV	NV	11.3	11.3	12.3	9.3														

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Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	Trigger (75% RUC)	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I	MW5-I
				22-Mar-16	01-Jun-16	22-Aug-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23
Alkalinity	500	374	280	255	308	312	297	267	314	242	Dry	207	Dry	236	Dry	218	296	252	Dry	223	Dry
Aluminum	0.1	0.08	0.058	0.03	0.03	0.04	0.07	0.03	0.06	0.06		0.06		0.05		0.06	0.08	0.06		0.02	
Ammonia, Total	NV	NV	NV	0.04	0.08	0.1	0.12	< 0.01	0.03	0.09		0.04		0.05		0.01	0.05	0.4		0.37	
Antimony	0.006	0.002	0.001	0.0003	< 0.0001	0.0002	0.0002	< 0.0001	0.0001	< 0.0001		< 0.0001		< 0.0001		0.0001	< 0.0001	< 0.0001		< 0.0001	
Arsenic	0.025	0.003	0.002	0.0003	0.0004	0.0003	0.0004	0.0002	0.0002	0.0003		0.0001		0.0001		0.0001	0.0002	< 0.0001		< 0.0001	
Barium	1	0.3	0.22	0.058	0.074	0.089	0.053	0.061	0.072	0.058		0.044		0.059		0.056	0.079	0.062		0.038	
Beryllium	NV	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		< 0.002		< 0.002		< 0.002	< 0.002	< 0.002		< 0.002	
Boron	5	1.3	1.0	0.046	0.068	0.054	0.055	0.03	0.065	0.057		0.053		0.071		0.066	0.099	0.07		0.04	
Cadmium	0.005	0.001	0.001	0.00002	< 0.00002	0.00002	< 0.00002	0.00003	0.000121	0.000063		< 0.000015		0.000023		< 0.000015	0.000022	< 0.000015		< 0.000010	
Calcium	NV	NV	NV	105	117	142	113	113	121	98.2		87.4		105		100	130	106		75.2	
Chloride	250	129	97	8	12.4	9.8	9.3	8.3	9.3	8.2		7.4		6.6		6.3	15.6	6.9		5.9	
Chromium	0.05	0.01	0.01	0.0007	0.0012	0.0009	0.0055	< 0.001	< 0.001	< 0.001		< 0.001		< 0.001		< 0.001	< 0.001	< 0.001		< 0.001	
Chromium (VI)	NV	NV	NV	-	-	-	-	-	-	-		-		-		-	-	-		< 0.001	
Cobalt	NV	NV	NV	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.012		0.007		< 0.005		< 0.005	< 0.005	< 0.005		< 0.005	
Chemical Oxygen Demand	NV	NV	NV	31	34	6	< 5	17	17	9		14		20		24	9	< 5		10	
Conductivity (uS/cm)	NV	NV	NV	526	651	643	624	556	639	501		454		524		488	580	526		444	
Copper	1	0.5	0.38	0.0009	< 0.0001	0.0006	< 0.0001	0.0006	0.0014	0.0009		0.0011		0.0028		0.0018	0.001	0.0008		0.0006	
Dissolved Organic Carbon	5	5.0	3.7	3.1	4.3	2.5	0.9	5.1	3.4	4.4		4.2		5.4		6.1	5.4	5.2		3	
Flouride	1.5	0.5	0.34	0.2	0.1	0.1	0.1	< 0.1	< 0.1	< 0.1		< 0.1		< 0.1		< 0.1	< 0.1	< 0.1		< 0.1	
Hardness	500	388	291	282	321	386	309	305	327	264		234		282		267	349	285		201	
Iron	0.3	0.2	0.15	0.027	1.04	0.087	0.197	0.018	0.02	0.044		0.157		0.031		0.03	0.341	0.018		0.009	
Lead	0.01	0.003	0.002	0.00006	< 0.00002	< 0.00002	< 0.00002	0.00003	0.0001	< 0.00002		0.00052		0.00007		0.00005	0.00041	0.00002		< 0.00002	
Magnesium	NV	NV	NV	4.85	6.68	7.63	6.41	5.23	5.93	4.59		3.68		4.68		4.24	5.87	4.78		3.2	
Manganese	0.05	0.0	0.03	0.024	0.438	0.114	0.213	0.149	0.058	0.1		0.008		0.14		0.01	0.098	0.04		0.004	
Mercury	0.001	0.0003	0.0002	< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	< 0.00002		< 0.00002		< 0.00002		< 0.00002	< 0.00002	< 0.00002		< 0.00002	
Molybdenum	NV	NV	NV	0.0002	< 0.0001	0.0002	0.0003	0.0001	0.0001	0.0001		0.0001		0.0003		0.0001	0.0001	0.0001		0.0002	
Nickel	NV	NV	NV	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		< 0.01		< 0.01	< 0.01	< 0.01		< 0.01	
Nitrate	10	2.6	2.0	0.2	0.1	0.2	0.2	< 0.1	0.33	< 0.05		0.28		< 0.05		0.21	0.16	0.19		0.08	
Nitrite	1	0.3	0.2	< 0.1	< 0.1	< 0.1	0.3	< 0.1	< 0.05	< 0.05		< 0.05		< 0.05		< 0.05	< 0.05	< 0.05		< 0.05	
pH (unit)	6.5 - 8.5	NV	NV	7.67	7.57	7.49	7.85	7.5	7.78	7.93		7.78		7.83		7.65	8.18	7.67		7.6	
Phenols	NV	NV	NV	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		< 0.002		< 0.002		< 0.002	< 0.002	< 0.001		0.004	
Dissolved Phosphorous	NV	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		< 0.1		< 0.1	< 0.1	< 0.1		< 0.1	
Total Phosphorous	NV	NV	NV	0.09	0.16	0.03	0.07	0.05	0.03	0.06		0.03		0.09		0.16	0.04	0.04		0.04	
Potassium	NV	NV	NV	0.7	0.9	1	0.9	0.6	0.9	0.8		0.7		0.9		0.8	1.1	0.8		0.6	
Selenium	0.01	0.003	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		< 0.001		< 0.001		< 0.001	< 0.001	< 0.001		< 0.001	
Silver	NV	NV	NV	< 0.00002	< 0.00002	< 0.00002	0.00008	< 0.00002	< 0.00002	< 0.00002		< 0.0001		< 0.0001		< 0.0001	< 0.0001	< 0.0001		< 0.0001	
Sodium	200	103	77	6.6	7.5	7.5	7.1	5.8	6.5	5.8		5.1		5.4		5.1	8.9	5.7		2.9	
Strontium	NV	NV	NV	0.206	0.256	0.294	0.247	0.218	0.231	0.192		0.165		0.191		0.185	0.251	0.207		0.157	
Sulphate	500	103	77	10	16	14	16	18	7	7		5		13		9	7	9		9	
Total Dissolved Solids	500	390	292	289	347	370	334	312	339	270		234		277		257	346	285		230	
Total Kjeldahl Nitrogen	NV	NV	NV	0.5	0.7	0.2	0.5	0.4	0.2	0.4		0.4		0.6		0.6	0.4	0.7		0.6	
Thallium	NV	NV	NV	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005		< 0.00005		< 0.00005		< 0.00005	< 0.00005	< 0.00005		< 0.00005	
Vanadium	NV	NV	NV	0.0005	0.0004	0.0019	0.0023	0.0014	0.0011	0.0015		0.0002		< 0.0001		< 0.0001	0.0001	< 0.0001		< 0.0001	
Zinc	5	2.5	1.9	0.006	< 0.005	0.008	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005		< 0.005		< 0.005	0.005	< 0.005		< 0.005	
Field Conductivity (µs/cm)	NV	NV	NV	348	545	455	545	457	570	590		510		545		570	650	445		360	
Field pH (units)	6.5 - 8.5	NV	NV	7.17	7.44	7.5	7.44	7.91	7.85	7.47		8.1		7.33		7.68	7.26	7.53		7.1	
Field Temperature (°C)	NV	NV	NV	7.2	16.5	8.4	16.5	6.8	10.7	8		9.1		8.3		8.4	9.4	9.4		9.7	

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Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	MW5-I	MW5-I	MW5-I	MW5-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	
			16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	22-Mar-16	01-Jun-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22
Alkalinity	500	374	Dry	Dry	198	Dry	485	Dry	Dry	396	Dry	484	Dry	432	Dry	452	Dry	Dry	Dry	464	Dry
Aluminum	0.1	0.08			0.05		0.04			0.04		0.1		0.08		0.08				0.08	
Ammonia, Total	NV	NV			<0.05		0.07			0.03		0.05		0.07		0.04				1.02	
Antimony	0.006	0.002			0.0001		< 0.0001			< 0.0001		< 0.0001		< 0.0001		< 0.0001				< 0.0001	
Arsenic	0.025	0.003			0.0001		0.0012			0.0009		0.001		0.0005		0.0007				0.0008	
Barium	1	0.3			0.043		0.151			0.116		0.172		0.133		0.149				0.158	
Beryllium	NV	NV			<0.0001		< 0.002			< 0.002		< 0.002		< 0.002		< 0.002				< 0.002	
Boron	5	1.3			0.043		0.025			< 0.005		0.03		0.03		0.022				0.025	
Cadmium	0.005	0.001			<0.000015		< 0.00002			< 0.000014		< 0.000015		< 0.000015		< 0.000015				< 0.000015	
Calcium	NV	NV			84.9		177			152		194		159		181				181	
Chloride	250	129			4		2.8			1.5		< 0.5		1.4		2				3.8	
Chromium	0.05	0.01			<0.001		0.0015			0.001		< 0.001		< 0.001		< 0.001				< 0.001	
Chromium (VI)	NV	NV			<0.01		-			-		-		-		-				-	
Cobalt	NV	NV			0.0003		< 0.005			< 0.005		0.006		0.005		< 0.005				< 0.005	
Chemical Oxygen Demand	NV	NV			19		20			11		14		14		7				< 5	
Conductivity (uS/cm)	NV	NV			416		899			733		941		845		889				900	
Copper	1	0.5			0.0007		0.0002			0.0004		0.0002		0.0009		0.0012				0.0002	
Dissolved Organic Carbon	5	5.0			4.6		2			4.1		4.7		4.2		3.3				4.1	
Flouride	1.5	0.5			<0.1		0.2			< 0.1		< 0.1		< 0.1		< 0.1				< 0.1	
Hardness	500	388			226		503			429		554		453		513				517	
Iron	0.3	0.2			0.165		3.66			2.83		3.83		2.67		4.91				6.23	
Lead	0.01	0.003			0.0002		< 0.00002			< 0.00002		< 0.00002		0.00002		0.00005				< 0.00002	
Magnesium	NV	NV			3.26		15.1			11.7		16.9		13.4		14.8				15.7	
Manganese	0.05	0.0			0.024		0.53			0.482		0.632		0.471		0.615				0.649	
Mercury	0.001	0.0003			<0.00002		< 0.00002			< 0.00002		< 0.00002		< 0.00002		< 0.00002				< 0.00002	
Molybdenum	NV	NV			0.0001		0.0002			0.0002		< 0.0001		0.0001		0.0002				0.0002	
Nickel	NV	NV			0.0007		< 0.01			< 0.01		< 0.01		< 0.01		< 0.01				< 0.01	
Nitrate	10	2.6			0.2		< 0.1			< 0.1		< 0.05		< 0.05		< 0.05				< 0.05	
Nitrite	1	0.3			<0.05		< 0.1			< 0.1		< 0.05		< 0.05		< 0.05				< 0.05	
pH (unit)	6.5 - 8.5	NV			7.5		7.15			7.34		7.63		7.42		7.65				7.52	
Phenols	NV	NV			<0.001		< 0.001			< 0.001		< 0.001		< 0.002		< 0.002				< 0.001	
Dissolved Phosphorous	NV	NV			<0.1		< 0.1			< 0.1		< 0.1		< 0.1		< 0.1				< 0.1	
Total Phosphorous	NV	NV			0.09		0.05			0.02		0.07		0.04		0.03				0.03	
Potassium	NV	NV			0.5		1.6			1.1		1.8		1.6		1.7				1.8	
Selenium	0.01	0.003			<0.001		< 0.001			< 0.001		< 0.001		< 0.001		< 0.001				< 0.001	
Silver	NV	NV			<0.0001		< 0.00002			< 0.00002		< 0.00002		< 0.0001		< 0.0001				< 0.0001	
Sodium	200	103			2.8		4.5			2.4		4.7		4.7		3.2				4	
Strontium	NV	NV			0.15		0.364			0.29		0.389		0.326		0.337				0.371	
Sulphate	500	103			12		9			9		8		8		9				7	
Total Dissolved Solids	500	390			215		505			419		520		451		489				502	
Total Kjeldahl Nitrogen	NV	NV			0.5		0.4			0.3		0.3		0.4		0.2				1.2	
Thallium	NV	NV			<0.00005		< 0.00005			< 0.00005		< 0.00005		< 0.00005		< 0.00005				< 0.00005	
Vanadium	NV	NV			0.0001		0.001			0.003		0.003		0.0001		0.0001				0.0001	
Zinc	5	2.5			<0.005		< 0.005			< 0.005		< 0.005		< 0.005		< 0.005				< 0.005	
Field Conductivity (µs/cm)	NV	NV			345		596			586		930		930		980				730	
Field pH (units)	6.5 - 8.5	NV			6.83		6.76			7.61		6.85		6.85		7.01				7.18	
Field Temperature (°C)	NV	NV			6.9		6.9			6.8		8		8		8				7.8	

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Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-I	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III
			10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	22-Mar-16	01-Jun-16	22-Aug-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21
Alkalinity	500	374	Dry	Dry	446	Dry	503	Dry	221	549	468	538	196	546	236	457	207	524	223	589	234
Aluminum	0.1	0.08			0.05		0.08		0.03	0.05	0.05	0.05	0.02	0.09	0.06	0.09	0.05	0.08	0.05	0.1	0.07
Ammonia, Total	NV	NV			0.33		0.08		0.21	0.32	0.27	0.32	0.02	0.58	0.2	0.21	0.14	0.14	0.03	0.9	0.12
Antimony	0.006	0.002			<0.0001		0.0001		0.0004	< 0.0001	0.0004	0.0002	< 0.0001	0.0001	< 0.0001	0.0001	0.0001	0.0001	0.0002	< 0.0001	0.0002
Arsenic	0.025	0.003			0.0006		0.0005		0.0043	0.001	0.0006	0.0008	0.0004	0.0011	0.0006	0.00063	0.0005	0.0005	0.0003	0.0009	0.0008
Barium	1	0.3			0.125		0.184		0.051	0.125	0.126	0.135	0.049	0.15	0.053	0.104	0.04	0.122	0.041	0.185	0.055
Beryllium	NV	NV			<0.0001		<0.0001		< 0.002	< 0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3			0.018		0.023		0.022	0.064	0.067	0.069	< 0.005	0.148	0.021	0.048	0.022	0.048	0.011	0.169	0.023
Cadmium	0.005	0.001			<0.00015		<0.00015		< 0.00002	< 0.00002	0.00005	< 0.00002	0.000015	0.000026	< 0.000015	0.000053	< 0.000015	0.000024	0.000043	0.000038	0.000042
Calcium	NV	NV			144		197		91	192	185	197	81.3	203	96.7	160	85.6	200	94.9	236	107
Chloride	250	129			5.3		6.5		2.1	9.8	3.9	6.3	1.3	27.7	0.7	2.3	2	2	1.4	18.4	2.2
Chromium	0.05	0.01			<0.001		<0.001		0.0007	0.0026	0.0013	0.0042	< 0.001	< 0.001	< 0.001	0.0003	< 0.001	< 0.001	< 0.001	0.001	< 0.001
Chromium (VI)	NV	NV			<0.01		<0.01		-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	NV	NV			0.0038		0.0052		< 0.005	0.008	0.008	0.009	< 0.005	< 0.005	0.008	0.00646	< 0.005	0.005	< 0.005	0.01	0.005
Chemical Oxygen Demand	NV	NV			<5		13		16	29	10	5	12	29	14	< 5	< 5	5	8	19	5
Conductivity (uS/cm)	NV	NV			824		948		441	1030	905	1020	392	1100	472	870	433	1010	455	1150	506
Copper	1	0.5			0.0004		0.0001		0.0002	< 0.0001	0.0007	< 0.0001	< 0.0001	0.0006	0.0018	0.00067	0.0009	< 0.0001	0.0022	0.0004	0.0018
Dissolved Organic Carbon	5	5.0			5.5		4.3		2.3	6.2	3.4	4.4	3.7	8.1	4.8	4.4	3.8	5.1	4.3	8.5	4.6
Flouride	1.5	0.5			<0.1		<0.1		0.2	0.1	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness	500	388			410		558		243	524	526	553	215	569	259	460	228	561	252	652	285
Iron	0.3	0.2			4.63		6.71		1.23	1.55	1.51	4.07	0.173	4.78	0.857	0.885	0.299	1.32	0.101	10.3	0.315
Lead	0.01	0.003			0.00003		0.00004		< 0.00002	0.00006	< 0.00002	< 0.00002	< 0.00002	0.00012	0.00009	0.00004	0.00009	0.00011	0.00014	0.00016	0.00015
Magnesium	NV	NV			12		15.9		3.9	10.6	15.1	14.7	2.93	14.9	4.19	14.6	3.39	14.9	3.55	15.2	4.34
Manganese	0.05	0.0			0.558		0.9		0.165	0.635	0.383	0.608	0.051	0.643	0.207	0.338	0.09	0.599	0.091	0.92	0.228
Mercury	0.001	0.0003			<0.00002		<0.00002		< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	NV	NV			0.0002		0.0001		0.0008	< 0.0001	0.0009	0.0002	0.0004	0.0002	0.0002	0.00047	0.0002	0.0003	0.0002	0.0002	0.0002
Nickel	NV	NV			0.0035		0.0041		< 0.01	< 0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	10	2.6			0.06		<0.05		0.1	0.1	0.7	< 0.1	< 0.1	< 0.05	< 0.05	0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05
Nitrite	1	0.3			<0.05		<0.05		< 0.1	< 0.1	<0.1	< 0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
pH (unit)	6.5 - 8.5	NV			7.54		7.25		7.64	7.33	7.31	7.54	7.75	7.43	7.91	7.63	7.81	7.45	7.84	7.14	7.59
Phenols	NV	NV			<0.001		<0.001		< 0.001	< 0.001	<0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dissolved Phosphorous	NV	NV			<0.1		<0.1		< 0.1	< 0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Phosphorous	NV	NV			0.02		0.05		0.14	0.07	0.03	0.02	0.04	0.02	0.04	0.03	0.03	0.03	< 0.01	0.03	0.03
Potassium	NV	NV			1.8		1.9		0.9	1.6	2.1	2	0.5	2.7	0.9	1.7	0.8	1.8	0.7	3.5	0.9
Selenium	0.01	0.003			<0.001		<0.001		< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	NV			<0.0001		<0.0001		< 0.00002	< 0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	200	103			2.4		3.3		2.3	8.6	10.2	10.1	1.1	22.9	2	8.1	2.2	6.1	1.3	20.5	2.2
Strontium	NV	NV			0.32		0.38		0.175	0.402	0.435	0.46	0.143	0.43	0.178	0.383	0.158	0.419	0.157	0.528	0.191
Sulphate	500	103			6		7		8	6	28	19	8	8	5	17	5	14	5	9	6
Total Dissolved Solids	500	390			434		504		243	561	530	577	214	613	253	480	224	555	241	667	264
Total Kjeldahl Nitrogen	NV	NV			0.5		0.5		0.5	0.8	0.4	0.5	0.3	1	0.6	0.3	0.4	0.4	0.2	1.2	0.3
Thallium	NV	NV			<0.00005		<0.00005		< 0.00005	< 0.00005	0.00009	0.00006	< 0.00005	0.00009	< 0.00005	0.000074	< 0.00005	0.00011	0.00006	< 0.005	0.00007
Vanadium	NV	NV			0.0001		<0.0001		0.0006	0.0011	0.0031	0.0019	0.0012	0.0027	0.0015	0.00018	0.0002	0.0003	0.0002	0.0005	0.0002
Zinc	5	2.5			<0.005		<0.005		< 0.005	< 0.005	0.006	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV	NV			800		714		291	735	613	855	333	885	540	760	470	695	475	740	580
Field pH (units)	6.5 - 8.5	NV			7.55		6.45		7.33	6.27	6.89	7.27	7.77	7.19	7.27	7.51	7.83	7.1	7.48	7.19	7.77
Field Temperature (°C)	NV	NV			9.2		6.9		6.7	9.6	8.18	10.5	6.4	14.9	8.3	10.3	8.3	7.4	8.5	7.8	8.4

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Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW9	MW9	MW9	MW9	MW9	MW9	MW9	MW9	MW9	MW9
			20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	01-Jun-16	22-Aug-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20
Alkalinity	500	374	357	252	591	232	581	251	Dry	257	Dry	199	326	284	Dry	277	nd, not acce	303	nd, not acce	323	nd, not acce
Aluminum	0.1	0.08	0.08	0.04	0.1	0.02	0.1	0.03		0.05		0.02	0.04	0.04		0.06		0.08		0.06	
Ammonia, Total	NV	NV	1.01	2.94	0.9	0.85	0.55	0.22		0.18		< 0.01	0.1	0.12		0.05		0.07		0.03	
Antimony	0.006	0.002	< 0.0001	< 0.0001	0.0002	< 0.0001	0.0002	<0.0001		<0.0001		< 0.0001	<0.0001	0.0002		0.0001		0.00013		< 0.0001	
Arsenic	0.025	0.003	0.0004	0.0006	0.0005	0.0005	0.0003	0.0005		0.0004		< 0.0001	0.0003	0.0002		0.0002		0.0001		0.0001	
Barium	1	0.3	0.115	0.058	0.17	0.036	0.14	0.044		0.056		0.016	0.041	0.029		0.027		0.034		0.037	
Beryllium	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001		<0.0001		< 0.002	<0.002	< 0.002		< 0.002		< 0.002		< 0.002	
Boron	5	1.3	0.127	0.025	0.125	0.013	0.061	0.013		0.02		0.018	0.075	0.047		0.023		0.074		0.12	
Cadmium	0.005	0.001	< 0.000015	< 0.000015	0.000035	< 0.000010	0.000158	<0.000015		<0.000015		< 0.00002	<0.00002	< 0.00002		< 0.000014		0.000013		0.000019	
Calcium	NV	NV	150	102	220	76.8	190	87.8		106		77.2	153	118		112		119		133	
Chloride	250	129	12.8	2.7	23.8	1.7	10.1	2.4		2.3		1	24.2	12.8		3.5		16.9		21.7	
Chromium	0.05	0.01	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001		<0.001		0.0007	0.0008	0.0023		< 0.001		0.00023		< 0.001	
Chromium (VI)	NV	NV	-	-	-	< 0.001	<0.01	<0.01		<0.01		-	-	-		-		-		-	
Cobalt	NV	NV	< 0.005	< 0.005	0.006	< 0.005	0.0075	0.0009		0.0009		< 0.005	<0.005	< 0.005		< 0.005		0.000087		< 0.005	
Chemical Oxygen Demand	NV	NV	10	< 5	27	12	18	5		11		24	9	6		12		6		6	
Conductivity (uS/cm)	NV	NV	678	497	1130	452	1060	476		509		381	710	598		546		627		725	
Copper	1	0.5	0.0007	0.0002	0.0009	0.0003	0.0007	0.0008		0.0003		0.0002	0.0011	< 0.0001		0.0008		0.00039		0.0002	
Dissolved Organic Carbon	5	5.0	7.8	4.3	7.7	4.6	7.3	5.4		2.9		4	3.3	3.7		3.6		5.7		4.8	
Flouride	1.5	0.5	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1		<0.1		0.2	0.1	0.1		< 0.1		< 0.1		< 0.1	
Hardness	500	388	408	274	620	206	542	235		284		202	402	311		292		315		348	
Iron	0.3	0.2	4.71	1.04	4.6	0.519	1.55	0.995		0.949		0.049	0.254	0.293		0.027		0.169		0.008	
Lead	0.01	0.003	0.00019	0.00011	0.00014	0.00009	0.00004	0.00007		0.0001		< 0.00002	<0.00002	< 0.00002		0.00003		0.00009		0.00004	
Magnesium	NV	NV	7.98	4.59	17.1	3.4	16.3	3.86		4.52		2.05	4.36	3.87		2.89		4.22		3.79	
Manganese	0.05	0.0	0.446	0.218	0.676	0.126	0.759	0.16		0.195		0.007	0.02	0.018		0.004		0.009		0.001	
Mercury	0.001	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002		<0.00002		< 0.00002	<0.00002	< 0.00002		< 0.00002		< 0.00002		< 0.00002	
Molybdenum	NV	NV	< 0.0001	0.0002	0.0002	0.0002	0.0004	0.0002		0.0002		< 0.0001	<0.00001	< 0.0001		< 0.0001		< 0.00004		< 0.0001	
Nickel	NV	NV	< 0.01	< 0.01	< 0.01	< 0.01	0.0041	0.0006		0.0008		< 0.01	<0.01	< 0.01		< 0.01		< 0.01		< 0.01	
Nitrate	10	2.6	< 0.05	< 0.05	< 0.05	< 0.05	0.05	<0.05		<0.05		0.1	0.4	0.4		0.21		0.13		1.18	
Nitrite	1	0.3	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05		<0.05		< 0.1	<0.1	< 0.1		< 0.05		< 0.05		< 0.05	
pH (unit)	6.5 - 8.5	NV	8.16	7.64	7.39	7.7	7.44	7.69		7.65		7.91	7.43	7.77		7.84		7.65		7.59	
Phenols	NV	NV	< 0.002	< 0.001	0.003	< 0.001	<0.001	<0.001		<0.001		< 0.001	<0.001	< 0.001		0.004		0.003		< 0.002	
Dissolved Phosphorous	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1		<0.1		< 0.1	<0.1	< 0.1		< 0.1		< 0.1		< 0.1	
Total Phosphorous	NV	NV	0.03	0.03	0.02	0.02	0.02	0.02		0.03		0.08	0.08	0.61		0.05		0.04		0.05	
Potassium	NV	NV	2.8	1.1	2.9	0.8	2.3	0.8		0.8		0.4	0.7	0.5		0.4		0.6		0.6	
Selenium	0.01	0.003	< 0.001	< 0.001	0.002	< 0.001	<0.001	<0.001		<0.001		< 0.001	<0.0001	< 0.001		< 0.001		0.0003		< 0.001	
Silver	NV	NV	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001		<0.0001		< 0.00002	<0.00002	< 0.00002		< 0.00002		< 0.00002		< 0.0001	
Sodium	200	103	12.2	2.5	15.7	1.3	9	1.5		1.6		0.9	13.7	7		2.4		9.1		12.5	
Strontium	NV	NV	0.317	0.194	0.493	0.162	0.426	0.18		0.186		0.146	0.288	0.236		0.195		0.248		0.242	
Sulphate	500	103	9	5	7	4	10	5		5		2	9	7		4		6		8	
Total Dissolved Solids	500	390	415	274	648	228	567	246		263		203	403	322		292		338		373	
Total Kjeldahl Nitrogen	NV	NV	1.3	1.1	0.4	1.1	0.3	0.4		0.4		0.5	9	3.4		0.3		0.4		0.4	
Thallium	NV	NV	< 0.00005	< 0.00005	0.00016	< 0.00005	0.00014	<0.00005		<0.00005		< 0.00005	<0.00005	< 0.00005		< 0.00005		< 0.000004		< 0.00005	
Vanadium	NV	NV	0.0003	0.0001	0.0005	0.0002	0.0002	<0.0001		<0.0001		0.0003	0.0019	0.001		0.0011		< 0.00007		0.0002	
Zinc	5	2.5	0.005	< 0.005	0.006	< 0.005	<0.005	<0.005		<0.005		< 0.005	0.008	< 0.005		< 0.005		< 0.005		< 0.005	
Field Conductivity (µs/cm)	NV	NV	780	435	805	370	650	485		426		342	591	535		885		550		555	
Field pH (units)	6.5 - 8.5	NV	7.05	7.45	7.1	7.2	7.44	7.5		6.84		6.59	7.03	7.29		7.19		7.35		7.34	
Field Temperature (°C)	NV	NV	8.4	7.5	10.2	9.5	8.5	7.9		6.9		13.36	14	13.1		14.9		14.9		12.8	

Notes:

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4. Bold text and shading indicates values exceeding
5. Bold, underlined, red text indicates values exceed
6. Bold & red text indicate trigger parameter exceed
7. NV / "-" indicates no value.

Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	MW9	MW9	MW9	MW9	MW9	MW9	MW9	MW9	MW9	MW9	MW9	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14
			08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	22-Mar-16	01-Jun-16	22-Aug-16	18-Oct-16	20-Apr-17	23-Oct-17	25-Apr-18	27-Sep-18
Alkalinity	500	374	263	nd, not access	236	nd, not access	302	nd, not access	343	Flooded	Destroyed	inaccessable	inaccessable	362	794	832	815	298	800	185	756
Aluminum	0.1	0.08	0.08		0.06		0.04		0.06					0.04	0.07	0.09	0.08	0.04	0.13	0.07	0.14
Ammonia, Total	NV	NV	0.12		0.18		0.07		1.81					0.04	0.08	0.13	0.08	< 0.01	0.07	0.01	0.07
Antimony	0.006	0.002	< 0.0001		< 0.0001		< 0.0001		0.0001					< 0.0001	< 0.0001	<0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	0.00004
Arsenic	0.025	0.003	< 0.0001		0.0002		0.0001		0.0001					0.0008	0.0052	0.0036	0.0018	0.0004	0.0035	0.0001	0.0017
Barium	1	0.3	0.029		0.022		0.035		0.034					0.164	0.38	0.501	0.445	0.12	0.433	0.054	0.427
Beryllium	NV	NV	< 0.002		< 0.002		< 0.002		<0.0001					< 0.002	< 0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	0.06		0.013		0.068		0.076					0.015	0.053	0.038	0.03	< 0.005	0.033	0.009	0.037
Cadmium	0.005	0.001	< 0.000015		< 0.000015		< 0.000010		<0.000015					< 0.00002	< 0.00002	<0.00002	< 0.00002	0.000019	< 0.000014	< 0.000015	< 0.000006
Calcium	NV	NV	116		99		126		125					143	311	407	357	124	341	78	325
Chloride	250	129	8.1		3.2		13.8		14.3					7.7	81.6	118	138	12	82.4	2.2	90.3
Chromium	0.05	0.01	0.001		< 0.001		0.001		<0.001					0.0013	0.0057	0.0007	0.0076	< 0.001	< 0.001	0.001	0.00059
Chromium (VI)	NV	NV	-		-		-		<0.01					-	-	-	-	-	-	-	-
Cobalt	NV	NV	< 0.005		< 0.005		< 0.005		0.0003					0.009	0.011	0.008	0.009	< 0.005	0.009	0.009	0.00881
Chemical Oxygen Demand	NV	NV	82		33		54		48					18	24	<5	6	24	25	15	6
Conductivity (uS/cm)	NV	NV	549		424		610		665					708	1660	1820	1890	609	1730	377	1710
Copper	1	0.5	0.0005		0.0004		0.0023		0.0006					0.0006	< 0.0001	<0.0001	< 0.0001	0.0006	0.0007	0.0006	0.00054
Dissolved Organic Carbon	5	5.0	4.8		6		4.8		10.8					3.1	3.4	2	2	5.5	3.1	3.7	6.5
Flouride	1.5	0.5	< 0.1		< 0.1		< 0.1		<0.1					< 0.1	0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hardness	500	388	303		258		329		327					379	847	1110	974	328	929	205	894
Iron	0.3	0.2	0.052		0.071		0.024		0.078					0.419	7.55	7.76	5.84	0.019	6.86	0.081	6.13
Lead	0.01	0.003	0.00002		0.00006		0.00004		0.00002					0.00005	< 0.00002	<0.00002	< 0.00002	< 0.00002	0.00013	0.00026	0.00007
Magnesium	NV	NV	3.21		2.45		3.49		3.48					5.25	16.7	21.1	19.9	4.21	18.6	2.35	19.8
Manganese	0.05	0.0	0.003		0.016		0.001		0.003					0.595	1.49	1.75	1.68	0.311	1.74	0.011	1.8
Mercury	0.001	0.0003	< 0.00002		< 0.00002		< 0.00002		<0.00002					< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	NV	NV	< 0.0001		< 0.0001		< 0.0001		<0.0001					0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0001	< 0.00004
Nickel	NV	NV	< 0.01		< 0.01		< 0.01		0.0011					< 0.01	< 0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	10	2.6	0.3		< 0.05		0.88		0.3					< 0.1	0.1	0.1	< 0.1	< 0.1	< 0.05	0.08	< 0.05
Nitrite	1	0.3	< 0.05		< 0.05		< 0.05		0.1					< 0.1	< 0.1	<0.1	< 0.1	< 0.1	< 0.05	< 0.05	0.06
pH (unit)	6.5 - 8.5	NV	7.64		8.21		7.53		7.51					7.22	7.07	7	7.32	7.35	7.14	8.01	7.38
Phenols	NV	NV	< 0.002		< 0.002		< 0.001		0.004					< 0.001	< 0.001	<0.001	< 0.001	< 0.001	0.005	< 0.001	0.006
Dissolved Phosphorous	NV	NV	< 0.1		< 0.1		< 0.1		<0.1					< 0.1	< 0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Phosphorous	NV	NV	0.62		0.39		0.22		0.2					0.03	0.02	0.04	0.02	0.3	0.09	0.1	0.03
Potassium	NV	NV	0.4		0.4		0.5		0.5					0.8	1.5	2	1.9	0.5	1.9	0.4	2
Selenium	0.01	0.003	< 0.001		< 0.001		< 0.001		<0.001					< 0.001	< 0.001	0.004	0.007	< 0.001	0.002	< 0.001	0.0012
Silver	NV	NV	< 0.0001		< 0.0001		< 0.0001		<0.0001					< 0.00002	< 0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Sodium	200	103	5.3		1.1		5.7		7					8.6	26.3	38.5	40.2	6.8	35.2	2.1	39.1
Strontium	NV	NV	0.207		0.177		0.225		0.222					0.254	0.593	0.777	0.737	0.21	0.632	0.128	0.709
Sulphate	500	103	8		3		5		5					6	26	32	36	10	23	2	31
Total Dissolved Solids	500	390	299		251		336		345					390	950	1130	1090	337	991	198	968
Total Kjeldahl Nitrogen	NV	NV	2.6		1.7		1.3		2.3					0.3	0.4	0.1	0.3	1	0.3	0.4	0.3
Thallium	NV	NV	< 0.005		< 0.00005		< 0.00005		<0.00005					0.00011	< 0.00005	<0.00005	< 0.00005	0.00008	< 0.00005	< 0.00005	< 0.000004
Vanadium	NV	NV	0.0001		< 0.0001		0.0002		0.0001					0.0011	0.0025	0.0054	0.0034	0.0026	0.0043	0.0015	< 0.00007
Zinc	5	2.5	0.005		< 0.005		< 0.005		<0.005					< 0.005	< 0.005	0.009	< 0.005	< 0.005	0.006	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV	NV	485		470		500		490					454	1210	1392	1580	487	1395	420	1430
Field pH (units)	6.5 - 8.5	NV	7.55		7.59		7.71		7.68					6.72	6.12	6.41	6.66	7.33	7.11	7.71	6.67
Field Temperature (°C)	NV	NV	11.5		15.1		14.2		12.2					6.5	9.59	9.9	10.2	6.5	9.9	8	9

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Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW15	MW15	MW15	MW15	MW15
			16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	22-Mar-16	01-Jun-16	18-Oct-16	20-Apr-17	23-Oct-17
Alkalinity	500	374	176	800	311	774	448	755	763	458	530	764	346	720	242	687	260	268	258	230	248
Aluminum	0.1	0.08	0.05	0.12	0.08	0.14	0.11	0.12	0.07	0.14	0.06	0.13	0.11	0.09	0.05	0.09	0.03	0.03	0.03	0.03	0.06
Ammonia, Total	NV	NV	0.02	0.08	< 0.01	0.04	0.03	0.08	0.57	0.3	2.54	0.4	0.25	0.19	<0.05	0.1	0.03	0.01	0.01	< 0.01	< 0.01
Antimony	0.006	0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0004	< 0.0001	< 0.0001
Arsenic	0.025	0.003	0.0002	0.0014	0.0002	0.0012	0.0004	0.0015	0.0004	0.0012	0.0016	0.0013	0.0036	0.0012	0.0002	0.0008	< 0.0001	< 0.0001	0.0003	< 0.0001	0.0002
Barium	1	0.3	0.051	0.431	0.125	0.453	0.24	0.438	0.177	0.481	0.252	0.453	0.207	0.464	0.117	0.424	0.05	0.031	0.029	0.043	0.027
Beryllium	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	5	1.3	0.006	0.029	0.03	0.036	0.043	0.046	0.025	0.033	0.062	0.026	0.04	0.045	0.013	0.024	0.011	0.061	0.227	< 0.005	0.167
Cadmium	0.005	0.001	< 0.000015	< 0.000015	< 0.000015	< 0.000015	0.000034	< 0.000015	< 0.000015	< 0.000012	< 0.000010	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.00002	< 0.00002	< 0.00002	< 0.000014	< 0.000014
Calcium	NV	NV	73.7	342	136	344	208	335	153	355	177	329	133	347	104	297	111	102	111	97.6	100
Chloride	250	129	3.3	86.2	9.3	63	10.8	72.5	15.7	158	4.5	17.8	24.1	127	21	182	1.6	1.7	2.1	1.4	1.6
Chromium	0.05	0.01	< 0.001	0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.0008	0.0011	0.0019	< 0.001	< 0.001
Chromium (VI)	NV	NV	-	-	-	-	-	-	-	-	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	-	-	-	-
Cobalt	NV	NV	0.006	0.009	< 0.005	0.015	0.011	0.009	0.007	0.017	0.01	0.0165	0.0047	0.0113	0.0003	0.0111	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chemical Oxygen Demand	NV	NV	15	< 5	16	8	11	7	14	18	44	19	24	26	45	18	< 5	16	< 5	5	13
Conductivity (uS/cm)	NV	NV	377	1750	660	1600	952	1500	947	1800	992	1810	728	1720	538	1800	515	533	560	450	540
Copper	1	0.5	0.001	< 0.0001	0.0025	0.0002	0.0025	0.0003	0.0008	0.0006	0.0004	0.0003	0.0027	0.0004	0.0008	0.0004	0.0006	0.0002	< 0.0001	0.0007	0.0008
Dissolved Organic Carbon	5	5.0	4	6	6.4	3	9.8	7.8	6.8	1.2	9.1	7.3	7.9	6.7	3.6	7.1	1	1.5	1.4	2.1	1.4
Flouride	1.5	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.2	< 0.1	< 0.1
Hardness	500	388	193	936	359	942	555	910	408	967	483	896	357	946	274	816	287	274	306	253	275
Iron	0.3	0.2	0.04	6.81	0.18	7.72	1.69	14	3.15	13.1	15.6	9.87	11.2	17.2	0.196	6.84	< 0.005	< 0.005	0.011	0.015	< 0.005
Lead	0.01	0.003	0.00007	0.00017	0.00007	0.00007	0.00009	0.00021	0.00036	0.00066	0.00019	0.00004	0.0077	< 0.00004	0.00017	< 0.00004	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00002
Magnesium	NV	NV	2.22	19.7	4.63	19.9	8.48	17.6	6.21	19.4	9.69	17.8	5.65	19	3.51	18	2.19	4.46	6.89	2.17	6.03
Manganese	0.05	0.0	0.014	1.95	0.288	2.11	1.97	2.42	1.3	2.3	1.72	2.15	0.78	2.1	0.003	1.58	< 0.001	< 0.001	0.005	< 0.001	0.001
Mercury	0.001	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum	NV	NV	0.0001	0.0003	0.0002	0.0003	0.0003	0.0004	0.0003	0.0003	0.0007	0.0004	0.0004	0.0004	0.0003	0.0004	< 0.0001	0.0004	0.0009	0.0001	0.001
Nickel	NV	NV	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0068	0.0028	0.0053	0.001	0.0044	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrate	10	2.6	< 0.05	0.06	0.08	< 0.05	0.09	< 0.05	< 0.05	< 0.5	< 0.05	< 0.05	0.19	< 0.05	0.22	1.05	0.1	0.2	0.2	< 0.1	0.16
Nitrite	1	0.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.05	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	0.3	< 0.1	< 0.05
pH (unit)	6.5 - 8.5	NV	7.88	7.3	7.7	7.08	7.26	7.51	7.44	7.17	7.39	7.22	7.66	7.59	7.55	7.32	7.74	7.93	8.03	7.76	8
Phenols	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.007	< 0.001	0.003
Dissolved Phosphorous	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Phosphorous	NV	NV	0.05	0.04	0.03	0.01	0.07	0.05	0.06	0.07	0.28	0.06	0.34	0.1	0.63	0.09	0.01	0.05	0.02	0.02	0.03
Potassium	NV	NV	0.4	2	0.8	2.2	1.4	2.2	1.1	2.2	2	2.2	1.4	2.3	0.6	2.3	0.6	1.1	1.6	0.4	1.7
Selenium	0.01	0.003	< 0.001	0.002	< 0.001	0.001	< 0.001	0.002	0.001	0.004	< 0.001	0.004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	NV	NV	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Sodium	200	103	2.1	37.4	6.1	34.9	9.2	31.9	6.2	42.3	7.7	45.7	7.8	32.3	6.2	39	1.5	1.7	1.9	0.9	1.7
Strontium	NV	NV	0.125	0.652	0.223	0.645	0.354	0.625	0.264	0.671	0.367	0.639	0.252	0.634	0.174	0.678	0.232	0.597	1.09	0.246	0.826
Sulphate	500	103	4	29	11	27	20	23	12	23	11	3	9	21	7	29	7	13	38	9	25
Total Dissolved Solids	500	390	191	1005	355	965	530	952	475	1074	548	996	379	940	279	993	281	286	318	250	285
Total Kjeldahl Nitrogen	NV	NV	0.4	0.3	0.3	0.2	0.4	0.5	0.9	0.4	3.6	0.6	1.2	0.6	1.3	0.4	0.3	0.2	1.1	0.1	0.2
Thallium	NV	NV	< 0.00005	0.00006	< 0.00005	< 0.005	0.0001	0.00008	0.00006	0.00008	0.00006	0.00007	< 0.00005	0.00007	< 0.00005	0.00007	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	NV	0.0003	0.0006	0.0002	0.0004	0.0006	0.0006	0.0006	0.0005	0.0009	0.0003	0.0051	0.0003	0.0002	0.0002	0.0005	0.0003	0.0008	0.0015	0.0007
Zinc	5	2.5	< 0.005	0.006	< 0.005	< 0.005	< 0.005	0.005	< 0.005	0.006	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV	NV	410	1140	740	880	1000	1690	603	1190	730	1050	743	1536	419	1477	321	462	495	378	440
Field pH (units)	6.5 - 8.5	NV	7.16	6.77	7.08	6.66	7.07	6.69	7.07	6.87	6.84	6.92	7.21	8.21	6.78	6.62	7.21	6.97	7.46	8.15	7.88
Field Temperature (°C)	NV	NV	6.5	8	8.1	8	9.4	8.9	7.8	9.2	10.5	8.7	9.9	9.2	8.1	8.9	5.7	9.21	11.9	5.9	11.2

Notes:

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4. Bold text and shading indicates values exceeding
5. Bold, underlined, red text indicates values exceed
6. Bold & red text indicate trigger parameter exceed
7. NV / "-" indicates no value.

Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15
			25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	21-Apr-25	08-Oct-25	18-Oct-16	MW16-I	MW16-I
Alkalinity	500	374	238	271	204	232	228	232	224	221	254	252	249	272	265	253	240	239	266	290	200	
Aluminum	0.1	0.08	0.06	0.08	0.05	0.05	0.06	0.07	0.08	0.06	0.05	0.06	0.02	0.06	0.03	0.03	0.05	0.05	0.03	0.96	0.01	
Ammonia, Total	NV	NV	0.02	0.04	0.01	0.04	< 0.01	< 0.01	< 0.01	0.02	0.07	< 0.01	0.47	0.85	0.08	0.09	<0.05	<0.05	0.28	0.36	0.39	
Antimony	0.006	0.002	< 0.0001	0.00014	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0007	0.0001	
Arsenic	0.025	0.003	< 0.0001	0.00015	< 0.0001	0.0001	< 0.0001	0.0001	0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0001	0.0005	0.0003	
Barium	1	0.3	0.048	0.03	0.036	0.032	0.047	0.03	0.048	0.037	0.055	0.034	0.041	0.031	0.044	0.04	0.047	0.047	0.04	0.114	0.033	
Beryllium	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.002	< 0.002		
Boron	5	1.3	0.023	0.347	0.014	0.257	0.013	0.212	0.012	0.104	0.012	0.164	0.013	0.144	0.015	0.046	0.01	0.011	0.113	0.023	< 0.005	
Cadmium	0.005	0.001	< 0.000015	< 0.000006	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000010	< 0.000010	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015	< 0.00002	0.000021		
Calcium	NV	NV	103	102	87.2	108	104	107	105	111	110	109	86.7	102	95.9	111	102	102	102	110	61.3	
Chloride	250	129	< 0.5	2.1	1.1	1.8	1.7	2.1	1.3	2.3	1.2	1.2	1.8	2.1	2.1	2.9	3.8	4	3.1	33.3	5.1	
Chromium	0.05	0.01	< 0.001	0.00007	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0058	< 0.001	
Chromium (VI)	NV	NV	-	-	-	-	-	-	-	-	-	-	< 0.001	<0.01	<0.01	<0.01	<0.01	<0.01	-	-		
Cobalt	NV	NV	0.011	0.000016	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.012	< 0.005	
Chemical Oxygen Demand	NV	NV	8	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	17	<5	9	<5	<5	12	< 5	116	
Conductivity (uS/cm)	NV	NV	479	574	422	542	466	530	482	459	522	556	481	551	507	530	488	484	567	670	401	
Copper	1	0.5	0.0002	0.00026	0.0006	0.0002	0.0001	0.0004	0.0019	0.0005	0.0006	0.0011	0.0003	0.0005	0.0005	0.0005	0.0002	0.0002	0.0007	0.0037	0.0027	
Dissolved Organic Carbon	5	5.0	2.5	2.6	2.2	2.3	2.4	2.2	3.4	2.3	2.4	2.1	2.1	3.6	3.4	3	2.2	2.5	4.3	1.6	3.6	
Fluoride	1.5	0.5	< 0.1	0.2	< 0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.1	< 0.1	
Hardness	500	388	266	288	225	299	269	295	271	298	284	300	225	280	250	296	263	263	280	297	165	
Iron	0.3	0.2	< 0.005	0.031	< 0.005	0.021	< 0.005	0.038	< 0.005	0.007	< 0.005	0.149	0.006	0.006	<0.005	0.006	<0.005	0.008	0.005	1.73	0.08	
Lead	0.01	0.003	< 0.00002	< 0.00002	< 0.00002	0.00005	< 0.00002	< 0.00002	0.00007	< 0.00002	< 0.00002	0.00003	< 0.00002	<0.00002	0.00002	<0.00002	0.00004	0.00004	<0.00002	0.00177	0.00007	
Magnesium	NV	NV	2.17	8.06	1.75	7.02	2.08	6.65	2.15	4.89	2.22	6.6	2.01	6.04	2.58	4.3	2.05	2.05	6.37	5.66	2.91	
Manganese	0.05	0.0	< 0.001	0.008	< 0.001	0.002	< 0.001	0.01	< 0.001	< 0.001	< 0.001	0.021	< 0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.226	0.075	
Mercury	0.001	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002		
Molybdenum	NV	NV	< 0.0001	< 0.00004	< 0.0001	0.0014	< 0.0001	0.0011	0.0001	0.0005	< 0.0001	0.0012	0.0003	0.001	0.0002	0.0004	<0.0001	<0.0001	0.0009	0.0078	0.0056	
Nickel	NV	NV	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0008	0.0008	0.0004	0.0009	0.0008	0.0006	< 0.01	< 0.01	
Nitrate	10	2.6	< 0.05	0.08	0.14	0.18	0.11	0.13	0.19	0.13	< 0.05	< 0.05	0.09	0.22	0.19	0.26	0.13	0.12	0.15	0.3	0.1	
Nitrite	1	0.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.09	0.14	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.1	< 0.1	
pH (unit)	6.5 - 8.5	NV	8.03	7.73	7.95	7.84	7.91	7.79	7.84	7.93	7.75	7.7	7.75	7.68	7.93	8.04	7.68	7.81	7.73	7.99	8	
Phenols	NV	NV	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	< 0.001	< 0.001	
Dissolved Phosphorous	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	< 0.1	< 0.1	
Total Phosphorous	NV	NV	0.03	< 0.01	0.02	0.02	< 0.01	0.03	0.06	0.04	0.01	0.03	0.12	0.02	0.04	0.03	0.02	0.02	0.02	19.4	0.75	
Potassium	NV	NV	0.5	2.2	0.5	1.7	0.6	1.7	0.6	1.3	0.5	1.6	0.6	1.6	0.7	1.5	0.4	0.4	1.8	0.6	0.3	
Selenium	0.01	0.003	< 0.001	< 0.0002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	< 0.001	
Silver	NV	NV	< 0.00002	0.00005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002	< 0.00002		
Sodium	200	103	1.2	2.6	0.9	1.8	1	1.7	1.1	1.5	1.1	1.6	1	1.6	1.1	1.4	0.9	0.9	1.7	47.8	21.6	
Strontium	NV	NV	0.214	1.96	0.179	1.55	0.201	1.48	0.209	0.699	0.226	1.53	0.213	1.23	0.262	0.453	0.191	0.191	1.45	0.341	0.183	
Sulphate	500	103	9	52	6	39	7	40	11	31	9	41	9	36	10	19	10	9	35	9	6	
Total Dissolved Solids	500	390	259	332	220	299	253	298	256	284	276	312	250	286	262	275	252	250	310	384	218	
Total Kjeldahl Nitrogen	NV	NV	0.1	0.2	0.2	0.2	<0.1	0.2	>0.1	0.2	0.2	0.2	0.5	0.8	0.3	0.3	0.2	0.2	0.8	3	0.2	
Thallium	NV	NV	< 0.00005	< 0.000004	< 0.00005	< 0.00005	< 0.00005	< 0.0005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	< 0.00005	< 0.00005		
Vanadium	NV	NV	0.0015	< 0.00007	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	< 0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0024	0.0011	
Zinc	5	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	< 0.005	
Field Conductivity (µs/cm)	NV	NV	550	490	480	420	555	545	580	520	450	435	385	410	511	494	382	382	567	585	340	
Field pH (units)	6.5 - 8.5	NV	7.67	7.8	6.78	7.7	7.53	7.21	7.81	7.53	7.74	7.7	7.44	7.45	7.72	7.56	6.54	6.54	7.61	7.33	7.8	
Field Temperature (°C)	NV	NV	3.5	9.1	5.5	8.9	4.4	7.3	6.5	10.6	6.2	9.4	6.6	9.2	6.5	8.8	6.3	6.3	8.8	12	5.4	

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 5. Bold, underlined, red text indicates values exceed
 6. Bold & red text indicate trigger parameter exceed
 7. NV / "-" indicates no value.

Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-I	MW16-II	MW16-II	MW16-II
			23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	18-Oct-16	20-Apr-17	23-Oct-17
Alkalinity	500	374	Dry	174	Dry	149	253	171	Dry	170	235	186	185	Dry	198	Dry	175	Dry	Dry	184	Dry
Aluminum	0.1	0.08		0.04		0.16	0.06	0.05		0.06	0.06	0.04	0.02		0.03		0.03			0.02	
Ammonia, Total	NV	NV		0.61		0.34	0.29	0.01		< 0.01	0.06	0.71	1.03		0.15		<0.05			0.05	
Antimony	0.006	0.002		0.0001		0.0003	0.0002	< 0.0001		0.0001	< 0.0001	0.0001	0.0001		<0.0001		<0.0001			< 0.0001	
Arsenic	0.025	0.003		0.0003		0.0005	0.0004	< 0.0001		0.0001	< 0.0001	0.0002	0.0001		0.0001		<0.0001			0.0001	
Barium	1	0.3		0.034		0.024	0.047	0.031		0.035	0.042	0.033	0.024		0.029		0.032			0.041	
Beryllium	NV	NV		< 0.002		< 0.002	< 0.002	< 0.002		< 0.002	< 0.002	< 0.002	< 0.002		<0.0001		<0.0001			< 0.002	
Boron	5	1.3		0.011		0.008	0.02	0.009		0.01	0.016	0.011	0.008		0.008		0.005			< 0.005	
Cadmium	0.005	0.001		0.000024		< 0.000015	< 0.000015	< 0.000015		< 0.000015	< 0.000015	< 0.000015	< 0.000010		<0.000015		<0.000015			< 0.000014	
Calcium	NV	NV		56.8		56.6	110	73.5		81.2	101	79.5	62.3		70.4		73.1			75.6	
Chloride	250	129		2.8		2.3	35.3	2.9		2.4	9.8	3.2	2.8		4.2		2.5			3.1	
Chromium	0.05	0.01		< 0.001		< 0.001	0.001	< 0.001		< 0.001	< 0.001	< 0.001	< 0.001		<0.001		<0.001			< 0.001	
Chromium (VI)	NV	NV		-		-	-	-		-	-	-	< 0.001		<0.01		<0.01			-	
Cobalt	NV	NV		0.014		< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005	< 0.005		0.0002		0.0001			< 0.005	
Chemical Oxygen Demand	NV	NV		65		839	58	15		6	9	25	8		6		26			38	
Conductivity (uS/cm)	NV	NV		352		317	633	356		368	455	379	360		385		353			369	
Copper	1	0.5		0.0003		0.0009	0.0008	0.0003		0.0021	0.0003	0.0036	0.0005		0.0008		0.0003			0.0015	
Dissolved Organic Carbon	5	5.0		3.6		3.8	2.4	3.8		5.3	4.6	4.8	5.2		5.3		4.3			3.8	
Flouride	1.5	0.5		< 0.1		< 0.1	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1		<0.1		<0.1			< 0.1	
Hardness	500	388		153		152	295	193		213	267	211	164		186		194			199	
Iron	0.3	0.2		0.026		0.249	0.64	0.007		0.016	0.107	1.3	0.007		0.038		0.028			< 0.005	
Lead	0.01	0.003		< 0.00002		0.00107	0.00022	0.00002		0.00007	0.00012	0.00005	< 0.00002		0.00004		0.00006			< 0.00002	
Magnesium	NV	NV		2.56		2.46	4.75	2.17		2.4	3.48	2.9	1.97		2.56		2.67			2.39	
Manganese	0.05	0.0		0.088		0.086	0.143	0.003		0.001	0.024	0.097	< 0.001		0.003		0.001			< 0.001	
Mercury	0.001	0.0003		< 0.00002		< 0.00002	< 0.00002	< 0.00002		< 0.00002	< 0.00002	< 0.00002	< 0.00002		<0.00002		<0.00002			< 0.00002	
Molybdenum	NV	NV		0.0037		0.0022	0.0018	0.0001		0.0001	0.0002	0.0009	0.0001		0.0001		0.0002			0.0004	
Nickel	NV	NV		< 0.01		< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01		0.0007		0.0008			< 0.01	
Nitrate	10	2.6		0.25		0.1	0.69	0.05		< 0.05	0.25	0.06	< 0.05		0.12		0.06			< 0.1	
Nitrite	1	0.3		< 0.05		< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05		<0.05		<0.05			< 0.1	
pH (unit)	6.5 - 8.5	NV		8.2		8.09	7.82	7.93		7.84	8.23	7.72	7.73		7.9		7.44			7.89	
Phenols	NV	NV		< 0.001		< 0.002	< 0.002	< 0.002		< 0.002	< 0.002	< 0.001	< 0.001		<0.001		<0.001			< 0.001	
Dissolved Phosphorous	NV	NV		< 0.1		< 0.1	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1		<0.1		<0.1			< 0.1	
Total Phosphorous	NV	NV		6.65		4.51	3.72	0.07		0.04	0.23	0.94	0.05		0.04		0.04			0.34	
Potassium	NV	NV		0.1		0.3	0.6	0.4		0.4	0.5	0.4	0.3		0.4		0.3			0.4	
Selenium	0.01	0.003		< 0.001		< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	< 0.001		<0.001		<0.001			< 0.001	
Silver	NV	NV		< 0.00002		< 0.0001	< 0.0001	< 0.0001		< 0.0001	< 0.0001	< 0.0001	< 0.0001		<0.0001		<0.0001			< 0.00002	
Sodium	200	103		13.9		7.7	11.8	1.4		1.4	3.4	4.8	1.1		1.9		1.4			1.7	
Strontium	NV	NV		0.144		0.131	0.237	0.119		0.137	0.184	0.142	0.126		0.142		0.12			0.129	
Sulphate	500	103		4		4	8	3		4	4	3	2		3		4			6	
Total Dissolved Solids	500	390		186		163	323	186		194	264	210	182		198		182			200	
Total Kjeldahl Nitrogen	NV	NV		2.7		3.3	0.6	0.2		0.2	0.2	0.9	1.1		0.4		0.3			0.4	
Thallium	NV	NV		< 0.00005		< 0.00005	< 0.00005	< 0.00005		< 0.00005	< 0.00005	< 0.00005	< 0.00005		<0.00005		<0.00005			< 0.00005	
Vanadium	NV	NV		0.001		0.0003	0.0002	< 0.0001		< 0.0001	< 0.0001	< 0.0001	< 0.0001		<0.0001		<0.0001			0.001	
Zinc	5	2.5		< 0.005		< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005	< 0.005		<0.005		<0.005			< 0.005	
Field Conductivity (µs/cm)	NV	NV		390		360	505	420		460	500	335	370		311		311			305	
Field pH (units)	6.5 - 8.5	NV		7.96		7.43	7.36	7.61		8.05	7.35	7.99	7.05		7.77		6.95			7.85	
Field Temperature (°C)	NV	NV		8.2		7.9	7.5	4.7		7.2	10.6	6	9.4		8.7		7.8			5.4	

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 6. Bold & red text indicate trigger parameter exceed
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Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW16-II	MW201D	MW201D	MW201D
			25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	04-Nov-19	20-Apr-20	08-Oct-20
Alkalinity	500	374	181	Dry	177	Dry	172	Dry	Dry	Dry	182	Dry	195	Dry	198	Dry	174	Dry	248	216	228
Aluminum	0.1	0.08	0.05		0.06		0.05				0.04		0.02		0.02		0.03		0.07	0.05	0.05
Ammonia, Total	NV	NV	0.05		0.03		< 0.01				0.29		2.68		0.07		0.07		0.1	0.04	0.04
Antimony	0.006	0.002	< 0.0001		< 0.0001		< 0.0001				< 0.0001		< 0.0001		< 0.0001		< 0.0001		0.0007	0.0002	< 0.0001
Arsenic	0.025	0.003	< 0.0001		< 0.0001		< 0.0001				< 0.0001		0.0001		0.0001		< 0.0001		0.0012	0.0005	0.0009
Barium	1	0.3	0.052		0.047		0.039				0.043		0.039		0.038		0.035		0.061	0.036	0.038
Beryllium	NV	NV	< 0.002		< 0.002		< 0.002				< 0.002		< 0.002		< 0.0001		< 0.0001		< 0.002	< 0.002	< 0.002
Boron	5	1.3	0.008		0.009		0.009				0.006		0.008		0.005		0.005		0.083	0.06	0.067
Cadmium	0.005	0.001	< 0.000015		< 0.000015		< 0.000015				< 0.000015		0.000212		< 0.000015		< 0.000015		0.00002	< 0.000015	< 0.000015
Calcium	NV	NV	76.8		71.6		77.9				79.5		67.1		70.2		72.9		109	94.7	102
Chloride	250	129	5.4		5		3.9				3.3		5.6		4.9		2.5		17.6	8.8	10.3
Chromium	0.05	0.01	< 0.001		< 0.001		< 0.001				< 0.001		< 0.001		< 0.001		< 0.001		< 0.001	< 0.001	0.001
Chromium (VI)	NV	NV	-		-		-				-		< 0.001		< 0.01		< 0.01		-	-	-
Cobalt	NV	NV	< 0.005		0.005		< 0.005				< 0.005		< 0.005		0.0001		< 0.0001		0.001	< 0.005	< 0.005
Chemical Oxygen Demand	NV	NV	13		11		16				< 5		6		6		10		66	23	< 5
Conductivity (uS/cm)	NV	NV	389		376		361				379		388		393		355		601	483	523
Copper	1	0.5	0.0017		0.0015		0.0019				0.0008		0.0007		0.0006		0.0004		0.0009	0.0009	0.0003
Dissolved Organic Carbon	5	5.0	1.1		4.1		4.1				4.2		4.7		5.6		4.3		5.2	4.8	4.5
Flouride	1.5	0.5	< 0.1		< 0.1		< 0.1				< 0.1		< 0.1		< 0.1		< 0.1		< 0.1	< 0.1	< 0.1
Hardness	500	388	204		191		205				209		178		186		191		306	254	275
Iron	0.3	0.2	0.019		0.041		0.006				0.012		< 0.005		0.006		< 0.005		1.34	0.195	0.437
Lead	0.01	0.003	0.00005		0.0001		0.00004				< 0.00002		< 0.00002		0.00002		0.00003		0.00009	0.00006	0.00005
Magnesium	NV	NV	2.86		2.8		2.48				2.58		2.53		2.64		2.21		8.07	4.09	4.82
Manganese	0.05	0.0	0.005		0.003		< 0.001				0.001		< 0.001		< 0.001		< 0.001		0.063	0.038	0.091
Mercury	0.001	0.0003	< 0.00002		< 0.00002		< 0.00002				< 0.00002		< 0.00002		< 0.00002		< 0.00002		0.00006	< 0.00002	< 0.00002
Molybdenum	NV	NV	0.0013		0.001		0.0002				0.0002		0.0003		0.0002		0.0001		0.0093	0.0017	0.001
Nickel	NV	NV	< 0.01		< 0.01		< 0.01				< 0.01		< 0.01		0.0007		0.0007		< 0.01	< 0.01	< 0.01
Nitrate	10	2.6	< 0.05		< 0.05		< 0.05				0.07		< 0.05		0.05		0.06		0.12	0.08	0.07
Nitrite	1	0.3	< 0.05		< 0.05		< 0.05				< 0.05		< 0.05		< 0.05		< 0.05		< 0.05	< 0.05	< 0.05
pH (unit)	6.5 - 8.5	NV	8.13		7.98		7.92				7.65		7.75		7.91		7.52		7.95	7.86	7.82
Phenols	NV	NV	< 0.001		< 0.002		< 0.002				< 0.001		< 0.001		< 0.001		< 0.001		< 0.002	< 0.002	< 0.002
Dissolved Phosphorous	NV	NV	< 0.1		< 0.1		< 0.1				< 0.1		< 0.1		< 0.1		< 0.1		< 0.1	< 0.1	< 0.1
Total Phosphorous	NV	NV	0.06		0.08		0.02				0.07		0.07		0.05		0.04		1.22	0.47	0.19
Potassium	NV	NV	0.4		0.5		0.4				0.3		0.5		0.4		0.2		1.6	0.8	0.9
Selenium	0.01	0.003	< 0.001		< 0.001		< 0.001				< 0.001		< 0.001		< 0.001		< 0.001		< 0.001	< 0.001	< 0.001
Silver	NV	NV	< 0.00002		< 0.0001		< 0.0001				< 0.0001		< 0.0001		< 0.0001		< 0.0001		< 0.0001	< 0.0001	< 0.0001
Sodium	200	103	6.3		5.4		2.1				1.7		2.8		3		1.1		10.2	5.7	8.8
Strontium	NV	NV	0.133		0.126		0.122				0.133		0.137		0.141		0.118		1.05	0.637	0.865
Sulphate	500	103	2		3		3				3		3		3		4		60	19	32
Total Dissolved Solids	500	390	203		195		194				200		199		203		183		357	263	296
Total Kjeldahl Nitrogen	NV	NV	0.2		0.3		0.2				0.5		2.6		0.4		0.3		1.1	0.4	0.3
Thallium	NV	NV	< 0.00005		< 0.00005		< 0.00005				< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005	< 0.00005	< 0.005
Vanadium	NV	NV	0.0012		0.0001		< 0.0001				< 0.0001		< 0.0001		< 0.0001		< 0.0001		0.0001	0.0002	0.0002
Zinc	5	2.5	< 0.005		< 0.005		< 0.005				< 0.005		< 0.005		< 0.005		< 0.005		0.009	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV	NV	440		420		410				330		335		335		287		576	515	500
Field pH (units)	6.5 - 8.5	NV	7.7		7.5		7.63				8		7.22		7.96		7.03		8.25	7.65	7.6
Field Temperature (°C)	NV	NV	7.6		7.4		5.8				5.9		8.7		8.9		7.1		5.3	8.7	7.6

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Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	MW201D	MW201D	MW201D	MW201D	MW201D	MW201D	MW201D	MW201D	MW201D	MW201D	MW202	MW202	MW202	MW202	MW202	MW202	MW202	MW202	MW202
			14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	04-Nov-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23
Alkalinity	500	374	177	237	262	241	219	261	244	236	Obstructed	232	184	183	187	216	187	197	193	207	208
Aluminum	0.1	0.08	0.06	0.07	0.09	0.06	0.05	0.03	0.04	0.03		0.03	0.06	0.05	0.05	0.07	0.06	0.05	0.05	0.03	0.35
Ammonia, Total	NV	NV	0.45	0.07	1.02	0.09	1.55	1.24	0.99	0.62		0.22	0.43	0.31	0.25	0.04	0.28	1.22	0.25	4.26	1.25
Antimony	0.006	0.002	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	<0.0001	0.0001	<0.0001		<0.0001	0.0004	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001
Arsenic	0.025	0.003	0.0004	0.0009	0.0011	0.0019	0.0004	0.0019	0.0004	0.0011		0.0033	0.001	0.001	0.0004	0.0006	0.0002	0.0002	0.0003	0.0001	0.0003
Barium	1	0.3	0.014	0.044	0.047	0.048	0.03	0.043	0.032	0.044		0.042	0.056	0.018	0.016	0.043	0.017	0.014	0.016	0.012	0.013
Beryllium	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001	<0.0001		<0.0001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001
Boron	5	1.3	0.58	0.082	0.1	0.075	0.049	0.063	0.053	0.062		0.08	0.547	0.569	0.521	0.066	0.493	0.587	0.52	0.478	0.534
Cadmium	0.005	0.001	< 0.000015	< 0.000015	< 0.000015	< 0.000010	< 0.000010	<0.000015	<0.000015	<0.000015		<0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000010	< 0.000010	<0.000015
Calcium	NV	NV	85.3	112	112	108	75.4	102	83.8	105		93.8	85.2	82.3	81.9	106	83.6	82.6	80.8	66	80.6
Chloride	250	129	46.4	11.8	13.4	16.9	7.5	13.3	7.4	9.1		14.6	67.6	37.7	34.7	10.3	29.6	39.5	49.8	33.9	43.2
Chromium	0.05	0.01	< 0.001	< 0.001	< 0.001	< 0.001	0.001	<0.001	<0.001	<0.001		<0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Chromium (VI)	NV	NV	-	-	-	-	< 0.001	<0.01	<0.01	<0.01		<0.01	-	-	-	-	-	-	-	< 0.001	<0.01
Cobalt	NV	NV	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0004	0.0002	0.0007		0.0005	0.0001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0002
Chemical Oxygen Demand	NV	NV	< 5	< 5	16	18	31	13	53	39		70	44	6	< 5	< 5	< 5	< 5	11	8	7
Conductivity (uS/cm)	NV	NV	756	497	581	582	459	556	486	515		557	736	674	655	512	588	691	678	647	704
Copper	1	0.5	0.0014	0.0004	0.0009	0.0004	0.0009	0.0003	0.001	0.0004		0.0002	0.0003	0.0018	0.0002	0.0027	0.0001	0.0002	0.0009	0.0003	0.0003
Dissolved Organic Carbon	5	5.0	3.6	7.4	6.4	5.5	3.2	6.9	6	4.8		7.1	1.3	1.9	2.1	5.7	2.9	2	1.5	2	3.8
Flouride	1.5	0.5	0.8	< 0.1	< 0.1	< 0.1	0.1	<0.1	<0.1	<0.1		<0.1	0.6	0.4	0.7	< 0.1	< 0.1	0.4	0.5	0.9	1
Hardness	500	388	299	300	301	290	201	273	225	279		257	300	290	282	283	289	291	282	237	285
Iron	0.3	0.2	0.067	0.339	0.324	0.79	0.047	0.532	0.013	0.454		0.815	< 0.005	0.068	0.06	0.19	0.092	0.042	0.053	0.023	0.142
Lead	0.01	0.003	0.00007	0.00011	0.00034	0.00004	0.00012	0.00004	0.00007	0.00004		<0.00002	0.00004	0.00006	< 0.00002	0.00013	0.00003	0.00006	0.00005	0.00004	<0.00002
Magnesium	NV	NV	20.9	4.8	5.02	4.83	3.15	4.37	3.7	4.02		5.54	21.1	20.5	18.9	4.35	19.4	20.6	19.5	17.5	20.3
Manganese	0.05	0.0	0.006	0.136	0.092	0.165	0.014	0.087	0.008	0.125		0.045	0.013	0.007	0.006	0.039	0.006	0.005	0.006	0.003	0.004
Mercury	0.001	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002		<0.00002	0.00005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002
Molybdenum	NV	NV	0.0001	0.0005	0.0005	0.0008	0.0005	0.0009	0.0007	0.0004		0.0009	0.0012	0.0004	0.0002	0.0008	0.0004	0.0002	0.0005	0.0002	0.0002
Nickel	NV	NV	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0028	0.0016	0.0023		0.0017	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0008
Nitrate	10	2.6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.34	< 0.05		< 0.05	< 0.05	< 0.05	0.13	0.06	0.1	< 0.05	0.11	< 0.05	< 0.05
Nitrite	1	0.3	0.07	< 0.05	< 0.05	0.14	< 0.05	0.08	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06
pH (unit)	6.5 - 8.5	NV	7.79	8	7.75	7.66	7.85	7.9	7.77	7.97		7.75	8.03	7.96	7.91	7.79	8.07	7.79	7.88	7.97	8.11
Phenols	NV	NV	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002		< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Dissolved Phosphorous	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Phosphorous	NV	NV	0.07	0.12	0.15	0.09	0.2	0.13	0.42	0.18		0.8	0.78	0.17	0.09	0.17	0.09	0.07	0.05	0.03	0.03
Potassium	NV	NV	3.8	0.9	0.9	1	0.8	0.9	0.8	1		1.4	3.8	3.8	3.8	0.8	3.7	3.8	3.6	3.5	3.8
Selenium	0.01	0.003	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.001	< 0.001	< 0.001
Silver	NV	NV	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001		< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	200	103	25.1	9.4	12.5	16.7	6.4	10.6	5	7.1		14.6	35.6	27.4	25.3	7.6	19.6	27.2	19.8	16.2	29
Strontium	NV	NV	8.94	0.789	0.786	0.802	0.467	0.749	0.592	0.569		0.935	8.24	8.6	8.62	0.672	7.73	8.85	7.97	7.04	9.1
Sulphate	500	103	130	23	24	54	17	32	12	17		48	136	104	97	21	83	97	118	102	123
Total Dissolved Solids	500	390	419	305	328	347	242	288	251	267		318	464	386	375	280	352	391	409	364	366
Total Kjeldahl Nitrogen	NV	NV	0.5	0.3	1.1	0.4	1.7	1.7	1	1.1		1.2	1	0.5	0.4	0.3	0.4	1.2	1.6	4.4	1.1
Thallium	NV	NV	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005		< 0.00005	< 0.00005	< 0.00005	< 0.005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Vanadium	NV	NV	< 0.0001	< 0.0001	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002		0.0002	0.0003	< 0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Zinc	5	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Field Conductivity (µs/cm)	NV	NV	600	580	495	490	370	418	486	529		580	693	685	486	590	625	475	475	405	388
Field pH (units)	6.5 - 8.5	NV	7.85	7.55	7.83	7.72	7.22	7.78	8.05	7.65		7.69	8.9	8.1	8.1	8.2	7.35	7.94	7.94	7.05	7.95
Field Temperature (°C)	NV	NV	9.2	8.9	11.5	11	9.2	7.8	10	8.4		8	4.7	8.7	8.5	7.9	9.4	9.3	11.8	9.2	8.3

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 6. Bold & red text indicate trigger parameter exceed
 7. NV / "-" indicates no value.

Parameters	ODWQS	RUC	MW202	MW202	MW202	MW202	MW203	MW203	MW203	MW203	MW203	MW203	MW203	MW203	MW203	MW203	MW203	MW203	MW203	MW204	MW204
			16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	04-Nov-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	22-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	04-Nov-19	20-Apr-20
Alkalinity	500	374	214	193	211	220	195	144	145	138	159	147	142	144	148	142	139	138	138	158	181
Aluminum	0.1	0.08	0.04	0.02	0.02	0.02	0.04	0.08	0.09	0.09	0.08	0.06	0.09	0.04	0.05	0.06	0.05	0.05	0.05	0.08	0.06
Ammonia, Total	NV	NV	0.35	0.56	0.28	0.3	0.44	1.74	1.13	1.46	0.8	0.8	1.77	1.52	3.42	0.87	1.75	2.44	1.4	1.07	0.6
Antimony	0.006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	0.0014	0.0003	0.0003	0.0006	0.0001	0.0003	<0.0001	0.0004	0.0001	0.0002	0.0002	0.0008	0.0003	
Arsenic	0.025	0.003	0.0001	0.0003	0.0001	0.0002	0.0011	0.0022	0.0025	0.0028	0.0012	0.0028	0.0033	0.0042	0.0048	0.0013	0.0023	0.0015	0.0014	0.0045	0.0015
Barium	1	0.3	0.014	0.019	0.018	0.018	0.043	0.063	0.049	0.037	0.031	0.032	0.024	0.02	0.022	0.018	0.016	0.016	0.015	0.059	0.02
Beryllium	NV	NV	<0.0001	<0.0001	<0.0001	<0.0001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001	<0.0001	<0.0001	< 0.002	< 0.002	
Boron	5	1.3	0.485	0.458	0.393	0.387	0.414	3.43	3.51	3.73	3.77	3.71	4.08	3.92	4.17	4	4.24	4	4.41	1.87	2.19
Cadmium	0.005	0.001	<0.000015	<0.000015	<0.000015	<0.000015	0.000073	0.000037	< 0.000029	< 0.000029	< 0.000059	< 0.000029	< 0.000029	< 0.000029	<0.000030	<0.000015	<0.000015	<0.000030	<0.000030	< 0.000015	< 0.000015
Calcium	NV	NV	70.5	82	79.4	72.5	51.8	140	155	159	166	157	172	141	167	152	186	179	167	202	108
Chloride	250	129	24.5	39.7	15.6	16.7	40	574	612	552	659	623	834	724	900	749	729	816	797	177	30.9
Chromium	0.05	0.01	<0.001	<0.001	<0.001	<0.001	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	< 0.001
Chromium (VI)	NV	NV	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-	-	-	-	< 0.001	<0.01	<0.01	<0.01	<0.01	-	-
Cobalt	NV	NV	0.0001	0.0001	<0.0001	0.0002	0.0005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0003	0.0003	0.0003	0.0003	0.0003	< 0.0001	< 0.005
Chemical Oxygen Demand	NV	NV	<5	14	8	5	46	22	7	7	< 5	13	21	5	9	<5	43	41	31	5	< 5
Conductivity (uS/cm)	NV	NV	626	732	536	537	613	3590	3720	3880	4020	4130	4280	4270	4450	4500	4410	4510	4410	1710	1040
Copper	1	0.5	0.0003	0.0004	0.0004	0.0003	0.0016	0.0067	0.0002	0.0018	0.0051	< 0.0002	0.0003	< 0.0002	0.0002	0.0002	0.0002	<0.0002	0.0029	0.004	

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Bedrock Ground Water Quality Data

Parameters	ODWQS	RUC	MW204	MW204	MW204	MW204	MW204	MW204	MW204	MW204	MW204	MW204	MW204	MW204
			08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	08-Oct-25
Alkalinity	500	374	142	169	144	166	137	179	151	193	142	187	161	163
Aluminum	0.1	0.08	0.11	0.08	0.07	0.08	0.08	0.04	0.06	0.09	0.07	0.04	0.13	0.13
Ammonia, Total	NV	NV	0.95	0.2	0.63	0.73	0.93	0.81	1.51	<0.05	0.11	0.14	0.07	0.08
Antimony	0.006	0.002	0.0001	0.0001	< 0.0001	0.0001	0.0002	0.0002	0.0001	0.0002	0.0002	0.0001	0.0006	0.0001
Arsenic	0.025	0.003	0.0031	0.002	0.0014	0.0009	0.0012	0.0007	0.0018	0.0007	0.0006	0.0006	0.0006	0.0006
Barium	1	0.3	0.045	0.038	0.023	0.028	0.043	0.016	0.031	0.032	0.018	0.034	0.027	0.027
Beryllium	NV	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron	5	1.3	1.65	1.05	2.38	1.7	1.23	1.89	1.6	1.01	2	1.13	1.88	1.79
Cadmium	0.005	0.001	< 0.000029	< 0.000015	< 0.000029	< 0.000015	< 0.000029	< 0.000012	<0.000015	<0.000015	<0.000015	<0.000015	0.000028	<0.000015
Calcium	NV	NV	240	139	290	179	212	146	226	136	281	167	265	257
Chloride	250	129	190	47.1	229	114	229	93.6	248	106	258	124	215	199
Chromium	0.05	0.01	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (VI)	NV	NV	-	-	-	-	-	< 0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	NV	NV	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0005	0.0002	0.0002	0.0002	0.0002	0.0002
Chemical Oxygen Demand	NV	NV	< 5	< 5	< 5	< 5	17	< 5	<5	<5	25	17	21	7
Conductivity (uS/cm)	NV	NV	2140	927	2420	1510	2580	1440	2520	1390	2520	1460	2210	2090
Copper	1	0.5	0.0002	0.0016	0.0007	0.0003	0.001	0.0005	0.0013	0.0005	0.0009	0.0005	0.0009	0.0007
Dissolved Organic Carbon	5	5.0	0.8	2.5	1	0.9	< 0.2	0.8	1.7	2.4	2.4	1.7	3.3	3.4
Flouride	1.5	0.5	0.7	0.4	0.2	0.4	< 1	1.8	1.3	<0.1	<0.7	0.2	<0.7	<0.7
Hardness	500	388	860	471	1080	645	708	389	814	481	1050	581	961	926
Iron	0.3	0.2	0.327	0.034	< 0.005	0.052	0.106	< 0.005	0.104	0.048	<0.005	0.011	<0.005	<0.005
Lead	0.01	0.003	< 0.00009	0.00004	0.00023	< 0.00004	0.0001	< 0.00004	<0.00004	0.00015	<0.00002	0.00005	<0.00004	<0.00004
Magnesium	NV	NV	63.3	30.1	86.1	48	47.2	42.1	60.5	34.2	84.3	39.9	72.6	68.9
Manganese	0.05	0.0	0.025	0.006	0.02	0.012	0.026	0.008	0.027	0.002	0.019	0.002	0.02	0.018
Mercury	0.001	0.0003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Molybdenum	NV	NV	0.0007	0.0006	0.0006	0.0006	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0017	0.0005
Nickel	NV	NV	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0004	0.0005	0.0004	0.0008	0.0013	0.0012
Nitrate	10	2.6	< 0.05	0.38	0.12	0.34	< 0.5	< 0.5	<0.40	0.41	<0.40	0.46	<0.40	<0.40
Nitrite	1	0.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.5	<0.40	<0.05	<0.40	<0.05	<0.40	<0.40
pH (unit)	6.5 - 8.5	NV	7.77	7.9	8.1	7.82	7.7	7.91	7.95	7.94	7.96	7.81	7.73	7.72
Phenols	NV	NV	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Phosphorous	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Phosphorous	NV	NV	0.05	0.08	0.08	0.04	0.03	0.07	0.06	0.07	0.04	0.05	0.02	0.03
Potassium	NV	NV	8	4.9	10.1	7	5.9	6.8	7.4	5.1	9	5.6	8.1	7.9
Selenium	0.01	0.003	0.003	0.001	0.004	0.004	0.005	0.002	<0.001	<0.001	<0.001	0.002	<0.001	<0.001
Silver	NV	NV	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	200	103	113	52.5	163	101	85.1	97.3	116	69.5	155	79.1	139	131
Strontium	NV	NV	5.47	2.59	7.09	3.99	4.2	3.59	5.36	3.03	7.02	3.29	6.2	5.98
Sulphate	500	103	829	239	930	464	873	448	923	357	906	410	741	703
Total Dissolved Solids	500	390	1530	615	1796	1015	1536	942	1400	754	1400	793	1540	1470
Total Kjeldahl Nitrogen	NV	NV	1.1	0.3	0.7	1.1	1.2	1.2	1.6	0.3	0.6	0.4	0.2	0.2
Thallium	NV	NV	< 0.005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Vanadium	NV	NV	< 0.0004	0.0004	< 0.0004	0.0003	0.0005	0.0006	0.0003	0.0006	0.0004	0.0004	0.0004	0.0003
Zinc	5	2.5	0.013	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005	<0.005	0.005	<0.005	0.006
Field Conductivity (µs/cm)	NV	NV	950	1120	1870	980	970	790	1087	1167	964	1423	1423	1423
Field pH (units)	6.5 - 8.5	NV	7.15	7.93	7.7	7.75	7.64	6.95	7.48	7.59	8.72	7.02	7.88	7.88
Field Temperature (°C)	NV	NV	6.3	7.2	12.5	6.6	9.4	7.9	7.6	8.1	7.7	6.2	7.6	7.6

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Surface Water Quality Data

Parameters	PWQO	Trigger Limit	SW A 01-Jun-16	SW A 22-Aug-16	SW A 18-Oct-16	SW A 17-Jul-17	SW A 23-Oct-17	SW A 25-Apr-18	SW A 27-Sep-18	SW A 16-Apr-19	SW A 24-Oct-19	SW A 20-Apr-20	SW A 08-Oct-20	SW A 14-Apr-21	SW A 20-Oct-21	SW A 13-Apr-22	SW A 23-Oct-22
Alkalinity (as CaCO3)	decrease >25% of	235	150	Dry	Dry	198	Dry	160	Dry	149	240	158	Dry	176	Dry	169	Dry
Aluminum	0.075	NV	0.02			0.03		0.04		0.05	0.07	0.05		0.02		0.06	
Ammonia, total	NV	NV	0.01			0.02		0.02		0.03	0.07	0.02		0.11		0.72	
Antimony	0.02	NV	0.0001			0.0002		< 0.0001		0.0002	0.0004	0.0002		0.0002		0.0003	
Arsenic	0.005	NV	< 0.0001			0.0002		0.0004		< 0.0001	0.0002	< 0.0001		0.0001		0.0001	
Barium	NV	NV	0.008			0.015		0.012		0.014	0.03	0.012		0.012		0.014	
Beryllium	0.011	NV	< 0.002			< 0.002		< 0.002		< 0.002	< 0.002	< 0.002		< 0.002		< 0.002	
Boron	0.2	NV	0.031			0.011		< 0.005		0.006	0.012	0.007		0.006		< 0.005	
Cadmium	0.0001	NV	< 0.00002			< 0.000014		< 0.000014		< 0.000015	< 0.000015	< 0.000015		< 0.000015		< 0.000015	
Calcium	NV	NV	56.3			75.7		61.8		62	91.8	66.8		68.3		72.3	
Chloride	NV	NV	1			1.3		1.4		1.4	4.9	1.9		1.5		3.3	
Chromium	0.001	NV	0.0006			< 0.001		< 0.001		< 0.001	0.014	0.001		< 0.001		< 0.001	
Chromium (VI)	NV	NV	-			-		-		-	-	-		-		-	
Cobalt	0.0009	NV	< 0.005			< 0.0001		< 0.0001		0.0001	< 0.0001	< 0.0001		< 0.0001		< 0.0001	
Chemical Oxygen Demand	NV	30	25			20		12		< 5	13	10		8		16	
Conductivity (uS/cm)	NV	NV	293			390		312		306	490	328		341		338	
Copper	0.005	NV	< 0.0001			0.0004		< 0.0001		0.0002	0.0007	0.0005		0.0003		0.0006	
Dissolved Organic Carbon	NV	13	6.2			7.7		4.2		4	6.4	4.5		6.2		5.8	
Fluoride	NV	NV	0.1			< 0.1		< 0.1		< 0.1	< 0.1	< 0.1		< 0.1		< 0.1	
Hardness	NV	NV	149			197		162		157	242	189		197		189	
Iron	0.3	NV	0.008			0.031		0.006		0.025	0.089	0.039		0.006		0.049	
Lead	0.003	NV	< 0.00002			0.00004		< 0.00002		< 0.00002	0.00005	0.00005		< 0.00002		0.00005	
Magnesium	NV	NV	1.97			1.92		1.72		1.71	3.03	1.62		1.7		2.03	
Manganese	NV	NV	< 0.001			0.004		0.001		0.002	0.02	0.004		0.001		0.003	
Mercury	0.0002	NV	< 0.00002			< 0.00002		< 0.00002		< 0.00002	< 0.00002	< 0.00002		< 0.00002		< 0.00002	
Molybdenum	0.04	NV	< 0.0001			< 0.0001		< 0.0001		< 0.0001	0.0003	< 0.0001		0.0001		< 0.0001	
Nickel	0.025	NV	< 0.01			< 0.01		< 0.01		< 0.01	0.01	< 0.01		< 0.01		< 0.01	
Nitrate	NV	NV	< 0.1			< 0.05		< 0.05		< 0.05	1.38	< 0.05		< 0.05		0.07	
Nitrite	NV	NV	< 0.1			< 0.05		< 0.05		< 0.05	< 0.05	0.06		< 0.05		< 0.05	
pH (units)	6.5 - 8.5	NV	8.2			8.02		7.99		7.85	7.97	7.97		7.78		7.39	
Phenols	0.001	NV	< 0.001			0.006		< 0.001		< 0.002	< 0.002	< 0.002		< 0.002		< 0.001	
Dissolved Phosphorus	-	NV	< 0.1			0.03		< 0.1		< 0.1	< 0.1	< 0.1		< 0.1		< 0.1	
Total Phosphorus	0.03	NV	0.81			< 0.1		0.02		0.24	0.09	< 0.01		< 0.01		0.09	
Potassium	NV	NV	0.2			0.3		0.6		0.6	4.2	0.4		0.3		0.5	
Selenium	0.1	NV	< 0.001			< 0.001		< 0.001		< 0.001	< 0.001	< 0.001		< 0.001		< 0.001	
Silver	0.0001	NV	< 0.00002			< 0.00002		< 0.00002		< 0.0001	< 0.0001	< 0.0001		< 0.0001		< 0.0001	
Sodium	NV	NV	0.7			0.7		0.7		1	2.5	1		1.1		1	
Strontium	NV	NV	0.121			0.147		0.1		0.103	0.169	0.103		0.116		0.117	
Sulphate	NV	NV	1			< 1		2		3	13	5		4		3	
Total Dissolved Solids	NV	NV	151			199		164		159	266	171		182		184	
Total Kjeldahl Nitrogen	NV	NV	0.4			0.4		0.3		0.2	0.7	0.2		0.2		0.9	
Thallium	0.0003	NV	< 0.00005			< 0.00005		< 0.00005		< 0.00005	< 0.00005	< 0.00005		< 0.00005		< 0.00005	
Vanadium	0.006	NV	0.0003			0.0001		0.0002		< 0.0001	0.0004	0.0001		< 0.0001		0.0001	
Zinc	0.02	0.02	< 0.005			< 0.005		< 0.005		0.011	0.023	0.013		< 0.005		< 0.005	
Ammonia, unionized	0.02	0.01	< 0.01			< 0.01		< 0.01		< 0.01	< 0.01	< 0.01		< 0.01		0.02	
Biological Oxygen Demand	NV	NV	< 2			< 3		< 3		< 3	< 3	< 3		< 3		< 3	
Cyanide - Free (µg/L)	5	NV	< 0.005			< 0.005		< 0.005		< 0.005	< 0.005	< 0.005		< 0.005		< 0.005	
Colour (TCU)	NV	NV	17			21		8		14	24	8		14		11	
Total Suspended Solids	NV	NV	3			82		< 3		< 3	< 3	< 3		< 3		14	
Turbidity	NV	NV	1.3			2.1		0.3		0.5	0.9	0.9		1.5		0.8	
Field Conductivity (µs/cm)	NV	NV	-			297		390		350	365	410		440		305	
Field pH (units)	6.5 - 8.5	NV	-			7.9		7.97		7.8	8.2	7.94		8.15		8.34	
Field Temperature (°C)	NV	NV	-			22.3		3.8		7.8	9.6	9.3		12.9		7	
Dissolved Oxygen	NV	NV	-			4.92		6.81		10.01	6.81	-		14.21		-	

Notes:

1. Results in mg/L unless otherwise stated.
2. PWQO means Provincial Water Quality Objectives.
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Surface Water Quality Data

Parameters	PWQO	Trigger Limit	SW A 10-May-23	SW A 18-Oct-23	SW A 16-Apr-24	SW A 08-Oct-24	SW A 21-Apr-25	SW A 08-Oct-25	SW B 01-Jun-16	SW B 22-Aug-16	SW B 18-Oct-16	SW B 20-Apr-17	SW B 17-Jul-17	SW B 23-Oct-17	SW B 25-Apr-18	SW B 27-Sep-18	SW B 16-Apr-19
Alkalinity (as CaCO3)	decrease >25% of	235	167	Dry	183	Dry	164	Dry	171	222	Dry	159	202	213	32	Dry	137
Aluminum	0.075	NV	0.03		0.09		0.05		0.02	0.03		0.02	0.03	0.06	0.01		0.05
Ammonia, total	NV	NV	1.81		0.35		<0.05		< 0.01	0.07		< 0.01	0.03	0.63	0.11		0.03
Antimony	0.02	NV	0.0001		0.0004		0.0004		< 0.0001	0.0004		< 0.0001	0.0002	< 0.0001	< 0.0001		0.0003
Arsenic	0.005	NV	0.0001		0.0001		0.0001		0.0001	0.0002		0.0001	0.0001	0.0002	0.0002		< 0.0001
Barium	NV	NV	0.012		0.015		0.013		0.011	0.028		0.011	0.013	0.025	0.003		0.012
Beryllium	0.011	NV	< 0.002		<0.0001		<0.0001		< 0.002	< 0.002		< 0.002	< 0.002	< 0.002	< 0.002		< 0.002
Boron	0.2	NV	0.006		<0.005		<0.005		0.03	0.017		< 0.005	0.011	0.012	< 0.005		0.005
Cadmium	0.0001	NV	< 0.000015		<0.000015		<0.000015		< 0.00002	< 0.00002		< 0.000014	0.000041	< 0.000014	< 0.000014		< 0.000015
Calcium	NV	NV			75.1		68.1		68.7	103		60.6	68.9	84.3	12.8		56.4
Chloride	NV	NV	1.1		2.2		1.1		1	2		1	1.1	1.6	0.6		1.4
Chromium	0.001	NV	< 0.001		<0.001		<0.001		0.0005	0.0005		< 0.001	< 0.001	< 0.001	< 0.001		< 0.001
Chromium (VI)	NV	NV	0.003		<0.001		<0.001		-	-		-	-	-	-		-
Cobalt	0.0009	NV	< 0.0001		0.0002		0.0002		< 0.005	< 0.005		< 0.0001	< 0.0001	< 0.0001	< 0.0001		0.0002
Chemical Oxygen Demand	NV	30	5		10		15		19	18		13	14	28	12		13
Conductivity (uS/cm)	NV	NV	339		338		321		325	455		311	386	410	65		285
Copper	0.005	NV	0.0005		0.0004		0.0003		< 0.0001	< 0.0001		< 0.0001	0.0062	0.0001	< 0.0001		0.0002
Dissolved Organic Carbon	NV	13	6.3		6.4		5.6		5.5	8.7		4.3	7.3	8	2.2		4.4
Fluoride	NV	NV	< 0.1		<0.1		<0.1		0.1	0.1		< 0.1	< 0.1	< 0.1	< 0.1		< 0.1
Hardness	NV	NV	156		195		177		180	269		172	179	224	34		147
Iron	0.3	NV	0.028		0.091		0.019		0.01	0.009		< 0.005	0.013	0.024	< 0.005		0.027
Lead	0.003	NV	0.00005		0.00015		<0.00002		< 0.00002	< 0.00002		0.00004	0.00042	< 0.00002	0.00004		0.00006
Magnesium	NV	NV	1.59		1.82		1.59		2.04	2.47		1.54	1.71	3.16	0.38		1.56
Manganese	NV	NV	0.003		0.004		0.004		0.003	0.009		< 0.001	0.003	0.008	0.002		0.002
Mercury	0.0002	NV	< 0.00002		<0.00002		<0.00002		< 0.00002	< 0.00002		< 0.00002	< 0.00002	< 0.00002	< 0.00002		< 0.00002
Molybdenum	0.04	NV	< 0.0001		<0.0001		<0.0001		< 0.0001	< 0.0001		< 0.0001	0.0002	< 0.0001	< 0.0001		< 0.0001
Nickel	0.025	NV	< 0.01		0.0005		0.0007		< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01		< 0.01
Nitrate	NV	NV	0.18		<0.05		<0.05		< 0.1	< 0.1		< 0.1	< 0.05	< 0.05	< 0.05		< 0.05
Nitrite	NV	NV	< 0.05		<0.05		<0.05		< 0.1	< 0.1		< 0.1	< 0.05	< 0.05	< 0.05		< 0.05
pH (units)	6.5 - 8.5	NV	7.78		8.07		7.96		8.32	7.82		8.1	8.22	8.15	7.75		7.79
Phenols	0.001	NV	< 0.001		<0.001		<0.001		< 0.001	< 0.001		0.005	0.004	0.008	< 0.001		< 0.002
Dissolved Phosphorus	-	NV	< 0.1		0.04		0.02		< 0.1	< 0.1		< 0.01	< 0.01	0.03	< 0.1		< 0.1
Total Phosphorus	0.03	NV	0.06		0.04		0.02		1.11	0.04		< 0.1	< 0.1	< 0.1	0.02		0.25
Potassium	NV	NV	0.4		0.3		0.4		0.1	0.7		0.2	0.2	0.5	0.4		0.4
Selenium	0.1	NV	< 0.001		<0.001		<0.001		< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	< 0.001		< 0.001
Silver	0.0001	NV	< 0.0001		<0.0001		<0.0001		< 0.00002	< 0.00002		0.00002	< 0.00002	< 0.00002	< 0.00002		< 0.0001
Sodium	NV	NV	1.1		1.2		0.8		0.7	0.8		0.4	0.6	1.9	0.2		1
Strontium	NV	NV	0.115		0.125		0.102		0.139	0.189		0.104	0.134	0.176	0.021		0.094
Sulphate	NV	NV	3		3		4		1	11		5	< 1	2	< 1		2
Total Dissolved Solids	NV	NV	173		194		174		177	254		164	194	221	34		145
Total Kjeldahl Nitrogen	NV	NV	2.6		0.6		0.3		0.3	0.5		0.2	0.3	0.7	0.3		0.3
Thallium	0.0003	NV	< 0.00005		<0.00005		<0.00005		< 0.00005	< 0.00005		< 0.00005	< 0.00005	< 0.00005	< 0.00005		< 0.00005
Vanadium	0.006	NV	< 0.0001		0.0002		<0.0001		0.0002	0.0003		< 0.0001	< 0.0001	< 0.0001	0.0001		< 0.0001
Zinc	0.02	0.02	< 0.005		<0.005		0.01		< 0.005	< 0.005		< 0.005	< 0.005	0.024	0.007		0.009
Ammonia, unionized	0.02	0.01	0.02		0.01		<0.01		< 0.01	< 0.01		< 0.01	< 0.01	0.05	< 0.01		< 0.01
Biological Oxygen Demand	NV	NV	< 3		<3		<3		< 2	< 3		< 3	< 3	3	< 3		< 3
Cyanide - Free (µg/L)	5	NV	< 0.005		<0.005		<0.005		< 0.005	< 0.005		< 0.005	< 0.005	< 0.005	< 0.005		< 0.005
Colour (TCU)	NV	NV	16		10		8		12	17		14	15	13	10		10
Total Suspended Solids	NV	NV	< 3		7		17		6	4		< 3	< 3	20	< 3		< 3
Turbidity	NV	NV	0.9		0.4		0.4		0.8	0.9		0.4	0.6	1.6	0.3		0.7
Field Conductivity (µs/cm)	NV	NV	275		350		261		299	385		266	300	370	150		350
Field pH (units)	6.5 - 8.5	NV	7.58		8.38		7.21		7.17	7.83		8.12	7.77	7.8	7.95		7.15
Field Temperature (°C)	NV	NV	15.5		8		7.5		20.87	15.4		6.2	23.1	12.6	2.8		1
Dissolved Oxygen	NV	NV	6.75		3.01		7.51		12.01	4.01		7.21	5.24	4.91	6.92		9.2

Notes:

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Surface Water Quality Data

Parameters	PWQO	Trigger Limit	SW B	SW B	SW B	SW B	SW B	SW B	SW B	SW B	SW B	SW B	SW B	SW B	SW B	SW D	SW D
			24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23	18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25	01-Jun-16	22-Aug-16
Alkalinity (as CaCO3)	decrease >25% of	235	193	154	214	175	234	168	Dry	172	Dry	182	Dry	159	Dry	Dry	Dry
Aluminum	0.075	NV	0.06	0.05	0.06	0.02	0.06	0.04		0.02		0.03		0.04			
Ammonia, total	NV	NV	0.04	0.01	0.05	0.02	0.03	0.04		2.48		0.07		<0.05			
Antimony	0.02	NV	0.0004	< 0.0001	0.0003	0.0003	0.0002	0.0004		0.0003		0.0003		0.0003			
Arsenic	0.005	NV	0.0002	< 0.0001	0.0001	0.0001	0.0002	< 0.0001		0.0001		0.0001		0.0001			
Barium	NV	NV	0.023	0.012	0.019	0.011	0.018	0.012		0.011		0.014		0.013			
Beryllium	0.011	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		< 0.002		<0.0001		<0.0001			
Boron	0.2	NV	0.01	0.005	0.008	0.006	0.009	< 0.005		0.006		<0.005		<0.005			
Cadmium	0.0001	NV	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015		< 0.000015		<0.000015		<0.000015			
Calcium	NV	NV	82.6	70	97.7	65.4	96.3	69.5		59.1		73.8		68.8			
Chloride	NV	NV	2.2	2	2.8	1.4	2.6	3.2		1		2.2		1.2			
Chromium	0.001	NV	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		< 0.001		<0.001		<0.001			
Chromium (VI)	NV	NV	-	-	-	-	-	-		< 0.001		<0.001		<0.001			
Cobalt	0.0009	NV	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001		< 0.0001		0.0001		0.0001			
Chemical Oxygen Demand	NV	30	12	9	6	10	4	26		15		15		13			
Conductivity (uS/cm)	NV	NV	426	324	422	341	422	333		335		340		311			
Copper	0.005	NV	0.0005	0.0002	0.0006	0.0002	0.0002	0.0008		0.0005		0.0007		0.0002			
Dissolved Organic Carbon	NV	13	6.9	3.7	5.6	6.1	6	5.3		3.8		6.6		5.5			
Fluoride	NV	NV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		<0.1		<0.1			
Hardness	NV	NV	217	184	240	205	254	186		154		192		179			
Iron	0.3	NV	0.029	0.013	0.023	< 0.005	0.014	0.025		0.01		0.017		0.017			
Lead	0.003	NV	0.00005	< 0.00002	0.00003	< 0.00002	0.00002	0.00021		0.00003		0.00005		0.00002			
Magnesium	NV	NV	2.6	1.69	2.09	1.64	2.39	1.91		1.57		1.76		1.6			
Manganese	NV	NV	0.012	0.001	0.002	0.001	0.001	0.004		0.003		0.002		0.003			
Mercury	0.0002	NV	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002		< 0.00002		<0.00002		<0.00002			
Molybdenum	0.04	NV	0.0004	< 0.0001	0.0001	< 0.0001	0.0002	< 0.0001		< 0.0001		0.0001		<0.0001			
Nickel	0.025	NV	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		0.0007		0.0006			
Nitrate	NV	NV	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07		< 0.05		<0.05		<0.05			
Nitrite	NV	NV	< 0.05	0.08	< 0.05	< 0.05	< 0.05	<0.05		< 0.05		<0.05		<0.05			
pH (units)	6.5 - 8.5	NV	8.01	7.92	8	8	8.2	7.43		8.03		8.09		7.99			
Phenols	0.001	NV	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001		< 0.001		<0.001		<0.001			
Dissolved Phosphorus	-	NV	< 0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1		< 0.1		0.37		0.01			
Total Phosphorus	0.03	NV	0.04	< 0.01	0.23	0.03	0.08	0.03		0.02		0.37		0.01			
Potassium	NV	NV	1.3	0.3	0.5	0.3	0.5	0.4		0.4		0.3		0.3			
Selenium	0.1	NV	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		< 0.001		<0.001		<0.001			
Silver	0.0001	NV	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001		< 0.0001		<0.0001		<0.0001			
Sodium	NV	NV	1.1	0.9	1.2	1	0.9	0.9		1		1.1		0.9			
Strontium	NV	NV	0.149	0.106	0.156	0.11	0.164	0.112		0.113		0.122		0.102			
Sulphate	NV	NV	15	3	6	4	2	3		2		4		3			
Total Dissolved Solids	NV	NV	225	170	239	179	245	180		174		192		172			
Total Kjeldahl Nitrogen	NV	NV	0.4	0.2	2.1	0.8	1.3	0.4		2.4		3.5		0.2			
Thallium	0.0003	NV	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005		< 0.00005		<0.00005		<0.00005			
Vanadium	0.006	NV	0.0002	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001		< 0.0001		<0.0001		<0.0001			
Zinc	0.02	0.02	0.007	< 0.005	0.008	0.12	0.017	< 0.005		< 0.005		<0.005		0.007			
Ammonia, unionized	0.02	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		0.03		<0.01		<0.01			
Biological Oxygen Demand	NV	NV	< 3	< 3	< 3	< 3	7.1	< 3		< 3		<3		<3			
Cyanide - Free (µg/L)	5	NV	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005		<0.005		<0.005			
Colour (TCU)	NV	NV	22	7	14	13	17	10		11		10		8			
Total Suspended Solids	NV	NV	< 3	< 3	17	< 3	16	14		< 3		3		10			
Turbidity	NV	NV	0.6	0.3	1.1	1.6	0.5	5.2		0.4		1.4		0.5			
Field Conductivity (µs/cm)	NV	NV	355	375	420	450	455	295		280		387		262			
Field pH (units)	6.5 - 8.5	NV	7.88	7.85	7.43	8.03	8.22	8		7.58		7.73		7.17			
Field Temperature (°C)	NV	NV	8.4	4.6	7.9	8.8	12.1	5.9		10.4		8.4		6.7			
Dissolved Oxygen	NV	NV	5.79	-	-	11.32	2.69	-		7.9		2.42		7.62			

Notes:

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- NV / "-" indicates no value.

Surface Water Quality Data

Parameters	PWQO	Trigger Limit	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D	SW D
			18-Oct-16	20-Apr-17	17-Jul-17	23-Oct-17	25-Apr-18	27-Sep-18	16-Apr-19	24-Oct-19	20-Apr-20	08-Oct-20	14-Apr-21	20-Oct-21	13-Apr-22	23-Oct-22	10-May-23
Alkalinity (as CaCO3)	decrease >25% of	235	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Aluminum	0.075	NV															
Ammonia, total	NV	NV															
Antimony	0.02	NV															
Arsenic	0.005	NV															
Barium	NV	NV															
Beryllium	0.011	NV															
Boron	0.2	NV															
Cadmium	0.0001	NV															
Calcium	NV	NV															
Chloride	NV	NV															
Chromium	0.001	NV															
Chromium (VI)	NV	NV															
Cobalt	0.0009	NV															
Chemical Oxygen Demand	NV	30															
Conductivity (uS/cm)	NV	NV															
Copper	0.005	NV															
Dissolved Organic Carbon	NV	13															
Fluoride	NV	NV															
Hardness	NV	NV															
Iron	0.3	NV															
Lead	0.003	NV															
Magnesium	NV	NV															
Manganese	NV	NV															
Mercury	0.0002	NV															
Molybdenum	0.04	NV															
Nickel	0.025	NV															
Nitrate	NV	NV															
Nitrite	NV	NV															
pH (units)	6.5 - 8.5	NV															
Phenols	0.001	NV															
Dissolved Phosphorus	-	NV															
Total Phosphorus	0.03	NV															
Potassium	NV	NV															
Selenium	0.1	NV															
Silver	0.0001	NV															
Sodium	NV	NV															
Strontium	NV	NV															
Sulphate	NV	NV															
Total Dissolved Solids	NV	NV															
Total Kjeldahl Nitrogen	NV	NV															
Thallium	0.0003	NV															
Vanadium	0.006	NV															
Zinc	0.02	0.02															
Ammonia, unionized	0.02	0.01															
Biological Oxygen Demand	NV	NV															
Cyanide - Free (µg/L)	5	NV															
Colour (TCU)	NV	NV															
Total Suspended Solids	NV	NV															
Turbidity	NV	NV															
Field Conductivity (µs/cm)	NV	NV															
Field pH (units)	6.5 - 8.5	NV															
Field Temperature (°C)	NV	NV															
Dissolved Oxygen	NV	NV															

- Notes:
- 1. Results in mg/L unless otherwise stated.
 - 2. PWQO means Provincial Water Quality Objectives.
 - 3. Bold & shading indicates PWQO exceedance.
 - 4. NV / "-" indicates no value.

Surface Water Quality Data

Parameters	PWQO	Trigger Limit	SW D	SW D	SW D	SW D	SW D
			18-Oct-23	16-Apr-24	08-Oct-24	21-Apr-25	08-Oct-25
Alkalinity (as CaCO3)	decrease >25% of	235	Dry	170	Dry	164	Dry
Aluminum	0.075	NV		0.03		0.04	
Ammonia, total	NV	NV		0.41		<0.05	
Antimony	0.02	NV		0.0003		0.0004	
Arsenic	0.005	NV		0.0001		0.0001	
Barium	NV	NV		0.02		0.019	
Beryllium	0.011	NV		<0.0001		<0.0001	
Boron	0.2	NV		<0.005		0.006	
Cadmium	0.0001	NV		<0.000015		<0.000015	
Calcium	NV	NV		77.4		69	
Chloride	NV	NV		3		2.3	
Chromium	0.001	NV		<0.001		<0.001	
Chromium (VI)	NV	NV		<0.001		<0.001	
Cobalt	0.0009	NV		0.0001		0.0002	
Chemical Oxygen Demand	NV	30		9		11	
Conductivity (uS/cm)	NV	NV		329		316	
Copper	0.005	NV		0.0005		0.0003	
Dissolved Organic Carbon	NV	13		6.3		5.1	
Fluoride	NV	NV		<0.1		<0.1	
Hardness	NV	NV		202		181	
Iron	0.3	NV		0.021		0.064	
Lead	0.003	NV		0.00008		0.00004	
Magnesium	NV	NV		2.05		1.96	
Manganese	NV	NV		0.002		0.008	
Mercury	0.0002	NV		<0.00002		<0.00002	
Molybdenum	0.04	NV		0.0004		<0.0001	
Nickel	0.025	NV		0.0005		0.0007	
Nitrate	NV	NV		<0.05		<0.05	
Nitrite	NV	NV		<0.05		<0.05	
pH (units)	6.5 - 8.5	NV		8.02		8.06	
Phenols	0.001	NV		<0.001		<0.001	
Dissolved Phosphorus	-	NV		0.02		0.02	
Total Phosphorus	0.03	NV		0.02		0.02	
Potassium	NV	NV		0.3		0.4	
Selenium	0.1	NV		<0.001		<0.001	
Silver	0.0001	NV		<0.0001		<0.0001	
Sodium	NV	NV		1.5		1.5	
Strontium	NV	NV		0.133		0.121	
Sulphate	NV	NV		2		2	
Total Dissolved Solids	NV	NV		189		176	
Total Kjeldahl Nitrogen	NV	NV		1		0.3	
Thallium	0.0003	NV		<0.00005		<0.00005	
Vanadium	0.006	NV		<0.0001		0.0001	
Zinc	0.02	0.02		<0.005		<0.005	
Ammonia, unionized	0.02	0.01		<u>0.02</u>		<0.01	
Biological Oxygen Demand	NV	NV		<3		<3	
Cyanide - Free (µg/L)	5	NV		<0.005		<0.005	
Colour (TCU)	NV	NV		9		8	
Total Suspended Solids	NV	NV		<3		4	
Turbidity	NV	NV		0.8		0.5	
Field Conductivity (µs/cm)	NV	NV		349		282	
Field pH (units)	6.5 - 8.5	NV		8.32		7.47	
Field Temperature (°C)	NV	NV		10.4		6.5	
Dissolved Oxygen	NV	NV		2.46		8.01	

Notes:

1. Results in mg/L unless otherwise stated.
2. PWQO means Provincial Water Quality Objectives.
3. Bold & shading indicates PWQO exceedance.
4. NV / "-" indicates no value.

VOC Summary Tables

		MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-I	MW1-II	MW1-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II
Parameters	ODWQS	01-Jun-16	18-Oct-16	20-Apr-17	43031	27-Sep-18	24-Oct-19	08-Oct-20	20-Oct-21	23-Oct-22	18-Oct-23	08-Oct-24	08-Oct-25	01-Jun-16	20-Apr-17	01-Jun-16	18-Oct-16	20-Apr-17	23-Oct-17	27-Sep-18
Acetone	NV	< 30	< 30	< 30	< 30	< 30	<2	< 30	< 30	< 30	<30	<30	<30	150	180	< 30	< 30	< 30	< 30	< 30
1,1,1-Trichloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloro-ethylene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	NV	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Bromoform	NV	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<5	<5	<5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2,4-Trichloro-benzene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride	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	< 0.2	< 0.2	< 0.2
Chlorobenzene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	NV	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1	<1	<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	NV	-	-	-	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	NV	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Dichloromethane	50	< 5	< 5	< 5	< 5	-	-	-	-	-	< 5	<5	<5	< 5	< 5	< 5	< 5	< 5	< 5	-
Ethylbenzene	2.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylenedibromide	NV	< 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	< 0.2	< 0.2
Methyl Ethyl Ketone	NV	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	<20	<20	<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl-tert-butyl-ether	NV	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Methyl-isobutyl-ketone	NV	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	<20	<20	<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl Chloride	NV	-	-	-	-	< 0.3	< 0.3	< 5	< 5	< 5	<2	<5	<5	-	-	-	-	-	-	< 0.3
m-p-xylene	NV	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1	<1	<1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloro-ethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	24	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	NV	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<5	<5	<5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trihalomethanes	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 0.2	< 0.2	< 0.2	<0.2	<0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Xylene; total	300	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.5			< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
2-Chloroethyvinyl Ether	NV	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-

- Notes:
1. All results in µg/L unless otherwise stated.
 2. ODWQS means Ontario Drinking Water Quality Standards.
 3. Bold text and shading indicates values exceeding the ODWQS.
 4. Bold text indicates detection
 5. NV / "-" indicates no value.

VOC Summary Tables

		MW1-I	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW2-II	MW5-I	MW7	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III	MW8-III
Parameters	ODWQS	01-Jun-16	24-Oct-19	08-Oct-20	20-Oct-21	23-Oct-22	18-Oct-23	08-Oct-24	08-Oct-25	20-Oct-21	20-Oct-21	22-Mar-16	01-Jun-16	22-Aug-16	18-Oct-16	42845	23-Oct-17	27-Sep-18	24-Oct-19	08-Oct-20
Acetone	NV	< 30	<2	< 30	< 30	< 30	<30	<30	<30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	<2	<2
1,1,1-Trichloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.7	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloro-ethylene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	NV	< 2	< 2	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Bromoform	NV	< 5	< 5	< 5	< 5	< 5	<5	<5	<5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2,4-Trichloro-benzene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride	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	< 0.2	< 0.2	< 0.2
Chlorobenzene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	NV	< 1	< 1	< 1	< 1	< 1	<1	<1	<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	NV	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	NV	< 2	< 2	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Dichloromethane	50	< 5	-	-	-	-	<5	<5	<5	-	-	< 5	< 5	< 5	< 5	< 5	< 5	-	-	-
Ethylbenzene	2.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylenedibromide	NV	< 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	< 0.2	< 0.2
Methyl Ethyl Ketone	NV	< 20	< 20	< 20	< 20	< 20	<20	<2	<2	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl-tert-butyl-ether	NV	< 2	< 2	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Methyl-isobutyl-ketone	NV	< 20	< 20	< 20	< 20	< 20	<20	<20	<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl Chloride	NV	-	< 0.3	< 5	< 5	< 5	<2	<5	<5	< 5	< 5	-	-	-	-	-	-	< 0.3	< 0.3	< 0.3
m-p-xylene	NV	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1	<1	<1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloro-ethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	24	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	NV	< 5	< 5	< 5	< 5	< 5	<5	<5	<5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trihalomethanes	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	1	< 0.5	< 0.5	< 0.2	< 0.2	< 0.2	<0.2	<0.2	0.4	< 0.2	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Xylene; total	300	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.5			< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
2-Chloroethyvinyl Ether	NV	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-

- Notes:
1. All results in µg/L unless otherwise stated.
 2. ODWQS means Ontario Drinking Water Quality Standards.
 3. Bold text and shading indicates values exceeding the ODWQS.
 4. Bold text indicates detection
 5. NV / "-" indicates no value.

VOC Summary Tables

[illegible]

Notes:

1. All results in µg/L unless otherwise stated.
2. ODWQS means Ontario Drinking Water Quality Standards.
3. Bold text and shading indicates values exceeding the ODWQS.
4. Bold text indicates detection
5. NV / * indicates no value.

VOC Summary Tables

[illegible]

Notes:

1. All results in µg/L unless otherwise stated.
2. ODWQS means Ontario Drinking Water Quality Standards.
3. Bold text and shading indicates values exceeding the ODWQS.
4. Bold text indicates detection
5. NV / "-" indicates no value.

VOC Summary Tables

		MW1-I	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW14	MW15	MW15	MW15	MW15	MW15	MW15	MW15
Parameters	ODWQS	01-Jun-16	20-Apr-17	23-Oct-17	27-Sep-18	24-Oct-19	44112	20-Oct-21	23-Oct-22	18-Oct-23	08-Oct-24	08-Oct-25	22-Mar-16	01-Jun-16	18-Oct-16	20-Apr-17	23-Oct-17	27-Sep-18	24-Oct-19	08-Oct-20
Acetone	NV	< 30	< 30	< 30	< 30	<2	< 30	< 30	< 30	<30	<30	<30	< 30	< 30	< 30	< 30	< 30	< 30	<2	< 30
1,1,1-Trichloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloro-ethylene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	NV	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Bromoform	NV	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<5	<5	<5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2,4-Trichloro-benzene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride	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	< 0.2	< 0.2	< 0.2
Chlorobenzene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	NV	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1	<1	<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	NV	-	-	-	-	-	-	-	-	-	<2	<2	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	NV	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Dichloromethane	50	< 5	< 5	< 5	-	-	-	-	-	<5	<5	<5	< 5	< 5	< 5	< 5	< 5	-	-	-
Ethylbenzene	2.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylenedibromide	NV	< 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	< 0.2	< 0.2
Methyl Ethyl Ketone	NV	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	<20	<20	<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl-tert-butyl-ether	NV	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Methyl-isobutyl-ketone	NV	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	<20	<20	<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl Chloride	NV	-	-	-	< 0.3	< 0.3	< 5	< 5	< 5	<2	<5	<5	-	-	-	-	-	< 0.3	< 0.3	< 5
m-p-xylene	NV	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1	<1	<1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloro-ethane	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	24	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	NV	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<5	<5	<5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trihalomethanes	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 0.2	< 0.2	<0.2	<0.2	<0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
Xylene; total	300	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1			< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
2-Chloroethyvinyl Ether	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Notes:
- 1. All results in µg/L unless otherwise stated.
 - 2. ODWQS means Ontario Drinking Water Quality Standards.
 - 3. Bold text and shading indicates values exceeding the ODWQS.
 - 4. Bold text indicates detection
 - 5. NV / "-" indicates no value.

VOC Summary Tables

		MW1-I	MW15	MW15	MW15	MW15	MW15	MW15	MW16-I	MW16-I	MW16-I	MW16-I	MW16-II	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III	MW16-III
Parameters	ODWQS	01-Jun-16	20-Oct-21	23-Oct-22	18-Oct-23	08-Oct-24	08-Oct-25	18-Oct-16	20-Apr-17	24-Oct-19	20-Oct-21	20-Apr-17	18-Oct-16	20-Apr-17	23-Oct-17	27-Sep-18	24-Oct-19	08-Oct-20	08-Oct-24	08-Oct-25	
Acetone	NV	< 30	< 30	< 30	<30	<30	<30	< 30	< 30	<2	< 30	< 30	< 30	< 30	< 30	< 30	<2	< 30	<30	<30	
1,1,1-Trichloroethane	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
1,1,2,2-Tetrachloroethane	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
1,1,2-Trichloroethane	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
1,1-Dichloroethane	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
1,1-Dichloroethylene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
1,2-Dichlorobenzene	200	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
1,2-Dichloroethane	5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
cis-1,2-Dichloro-ethylene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
1,2-Dichloropropane	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
1,3-Dichlorobenzene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
1,4-Dichlorobenzene	5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Benzene	1	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Bromodichloromethane	NV	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	<2	
Bromoform	NV	< 5	< 5	< 5	<5	<5	<5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<5	<5	
1,2,4-Trichloro-benzene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Bromomethane	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Carbon tetrachloride	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	< 0.2	<0.2	<0.2	
Chlorobenzene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Chloroethane	NV	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-			
Chloroform	NV	< 1	< 1	< 1	<1	<1	<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1	<1	
Chloromethane	NV	-	-	-	-	<2	<2	-	-	-	-	-	-	-	-	-	-	-	<2	<2	
cis-1,3-Dichloropropene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Dibromochloromethane	NV	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	<2	
Dichloromethane	50	< 5	-	-	<5	<5	<5	< 5	< 5	< 5	-	< 5	< 5	< 5	< 5	-	-	-	<5	<5	
Ethylbenzene	2.4	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Ethylenedibromide	NV	< 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	<0.2	<0.2	
Methyl Ethyl Ketone	NV	< 20	< 20	< 20	<20	<20	<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	<20	<20	
Methyl-tert-butyl-ether	NV	< 2	< 2	< 2	<2	<2	<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<2	<2	
Methyl-isobutyl-ketone	NV	< 20	< 20	< 20	<20	<20	<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	<20	<20	
Methyl Chloride	NV	-	< 5	< 5	<2	<5	<5	-	-	-	< 5	-	-	-	-	< 0.3	< 0.3	< 5	<5	<5	
m-p-xylene	NV	< 1.0	< 1.0	< 1.0	<1	<1	<1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1	<1	
o-xylene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Styrene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
1,1,1,2-Tetrachloro-ethane	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Tetrachloroethene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Toluene	24	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
trans-1,2-Dichloroethene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
trans-1,3-Dichloropropene	NV	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Trichloroethylene	50	< 0.5	< 0.5	< 0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5	
Trichlorofluoromethane	NV	< 5	< 5	< 5	<5	<5	<5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	<5	<5	
Trihalomethanes	100	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-			
Vinyl Chloride	1	< 0.5	< 0.2	< 0.2	<0.2	<0.2	<0.2	< 0.5	< 0.5	< 0.5	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.2	<0.2	
Xylene; total	300	< 1.1	< 1.1	< 1.1	< 1.1			< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1			
2-Chloroethyvinyl Ether	NV	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-			

- Notes:
1. All results in µg/L unless otherwise stated.
 2. ODWQS means Ontario Drinking Water Quality Standards.
 3. Bold text and shading indicates values exceeding the ODWQS.
 4. Bold text indicates detection
 5. NV / "-" indicates no value.

VOC Summary Tables

		MW1-I	MW16-III (Dup)	MW17	MW201D	MW201D	MW202	MW202	MW203	MW203	MW204	MW204	MW204 (Dup)
Parameters	ODWQS	01-Jun-16	08-Oct-25	08-Oct-24	08-Oct-24	08-Oct-25	08-Oct-24	08-Oct-25	08-Oct-24	08-Oct-25	08-Oct-24	08-Oct-25	08-Oct-25
Acetone	NV	< 30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
1,1,1-Trichloroethane	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	200	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloro-ethylene	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	5	< 0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	1	< 0.5	<0.5	9.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	NV	< 2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bromoform	NV	< 5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2,4-Trichloro-benzene	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	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
Chlorobenzene	NV	< 0.5	<0.5	6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	NV	-											
Chloroform	NV	< 1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	NV	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
cis-1,3-Dichloropropene	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	NV	< 2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Dichloromethane	50	< 5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ethylbenzene	2.4	< 0.5	<0.5	41.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylenedibromide	NV	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methyl Ethyl Ketone	NV	< 20	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Methyl-tert-butyl-ether	NV	< 2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Methyl-isobutyl-ketone	NV	< 20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Chloride	NV	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
m-p-xylene	NV	< 1.0	<1	58	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-xylene	NV	< 0.5	<0.5	3.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloro-ethane	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	24	< 0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	NV	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	50	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	NV	< 5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Trihalomethanes	100	-											
Vinyl Chloride	1	< 0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	300	< 1.1											
2-Chloroethyvinyl Ether	NV	-											

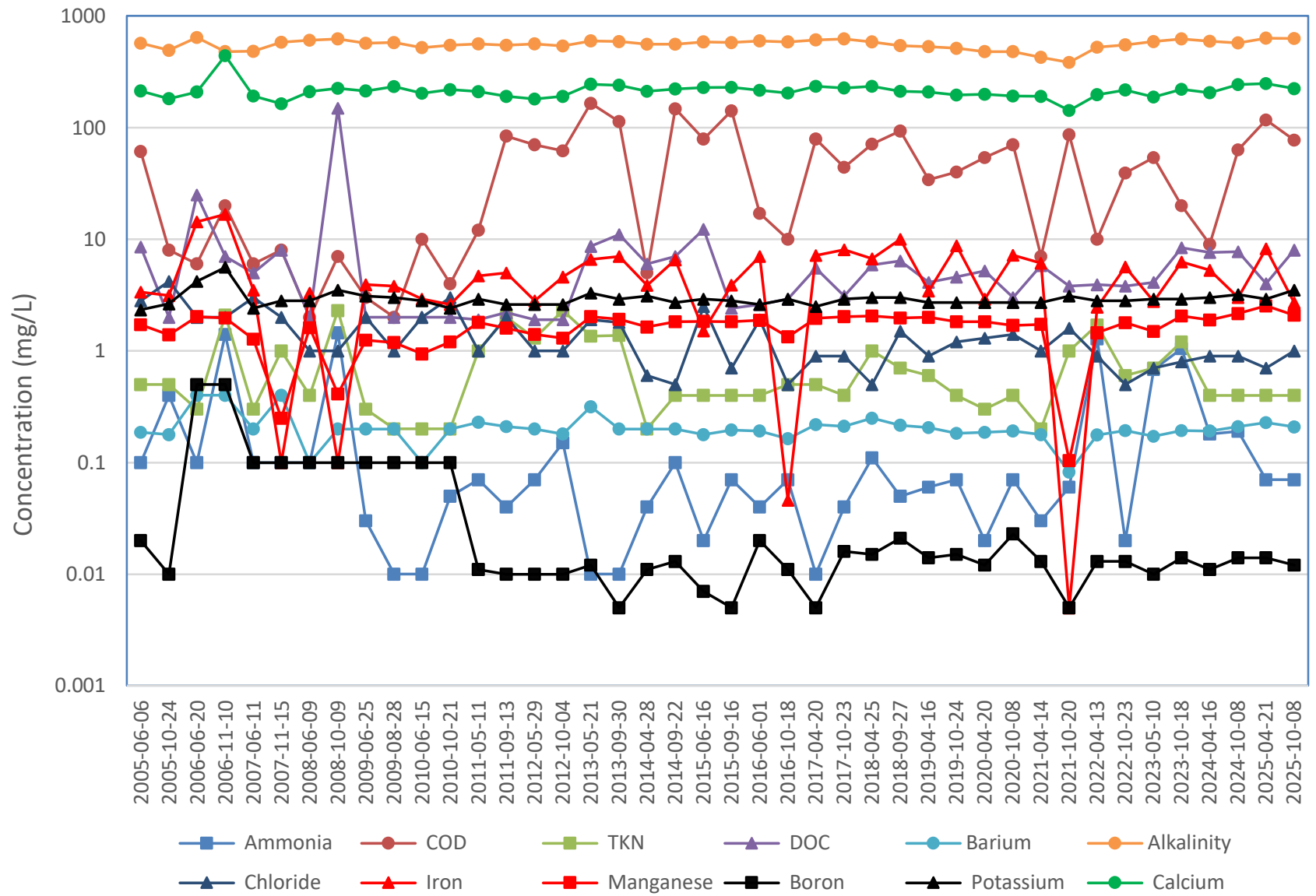
- Notes:
1. All results in µg/L unless otherwise stated.
 2. ODWQS means Ontario Drinking Water Quality Standards.
 3. Bold text and shading indicates values exceeding the ODWQS.
 4. Bold text indicates detection
 5. NV / "-" indicates no value.



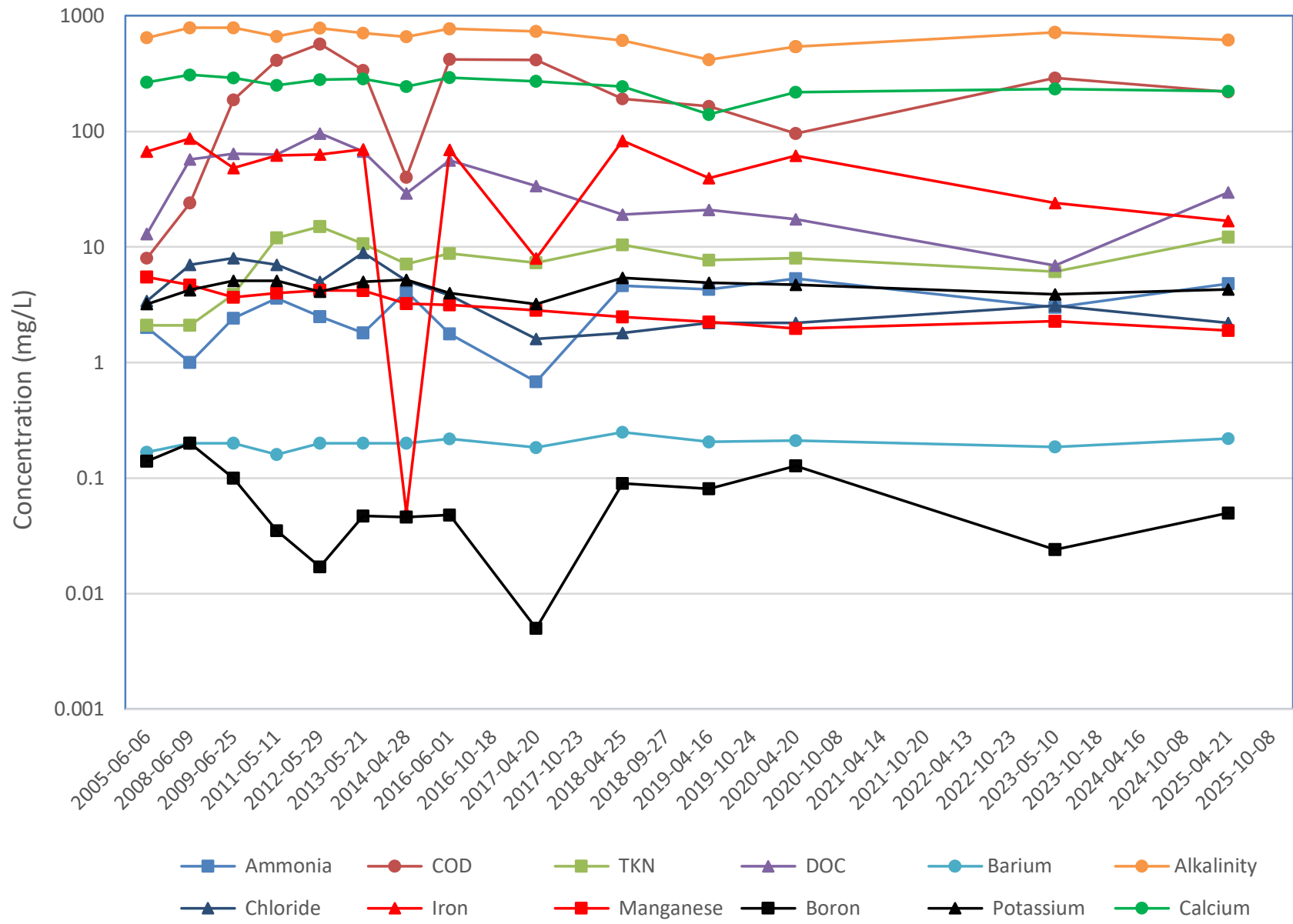
APPENDIX F

Chemistry Over Time Graphs

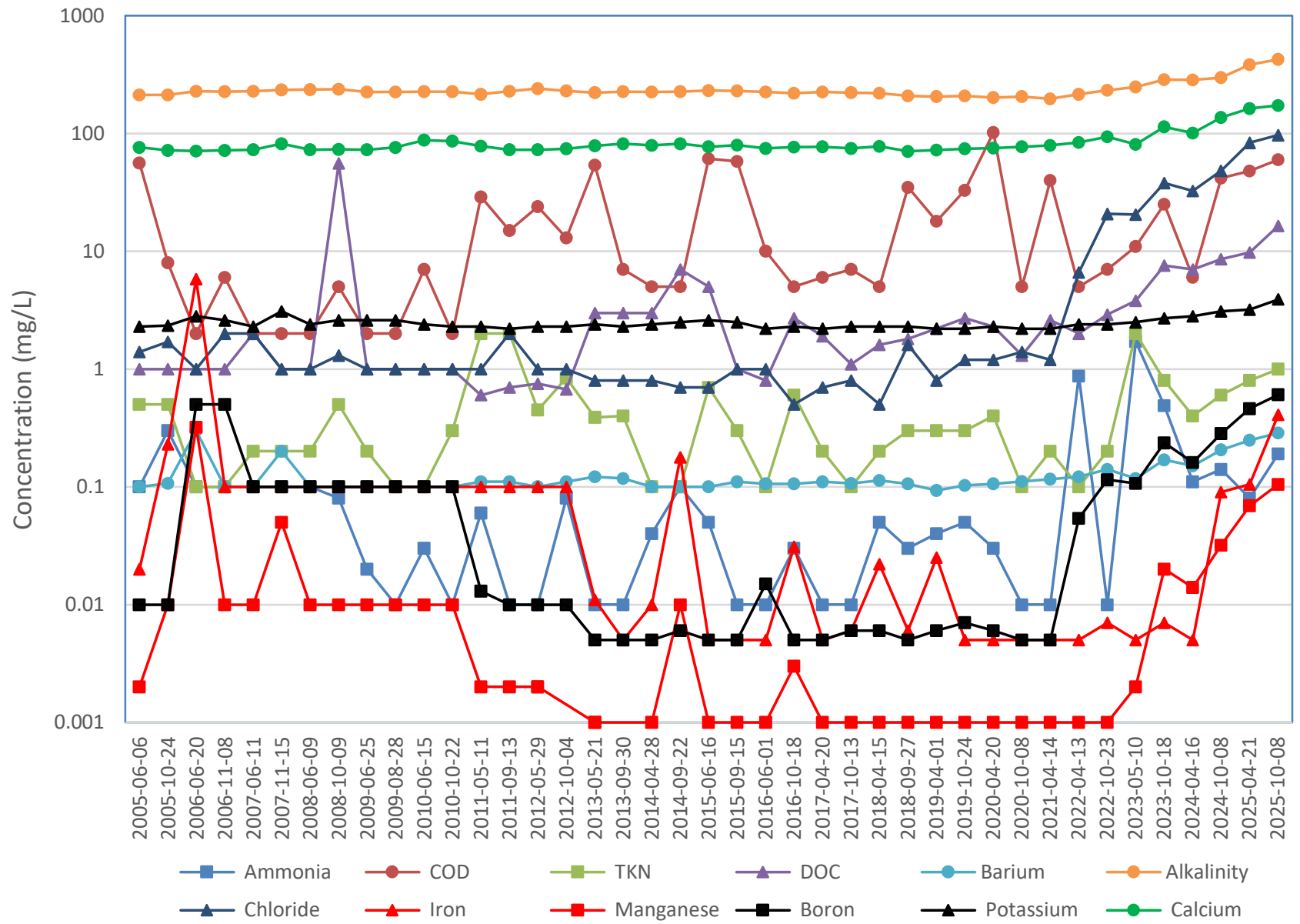
MW1-I



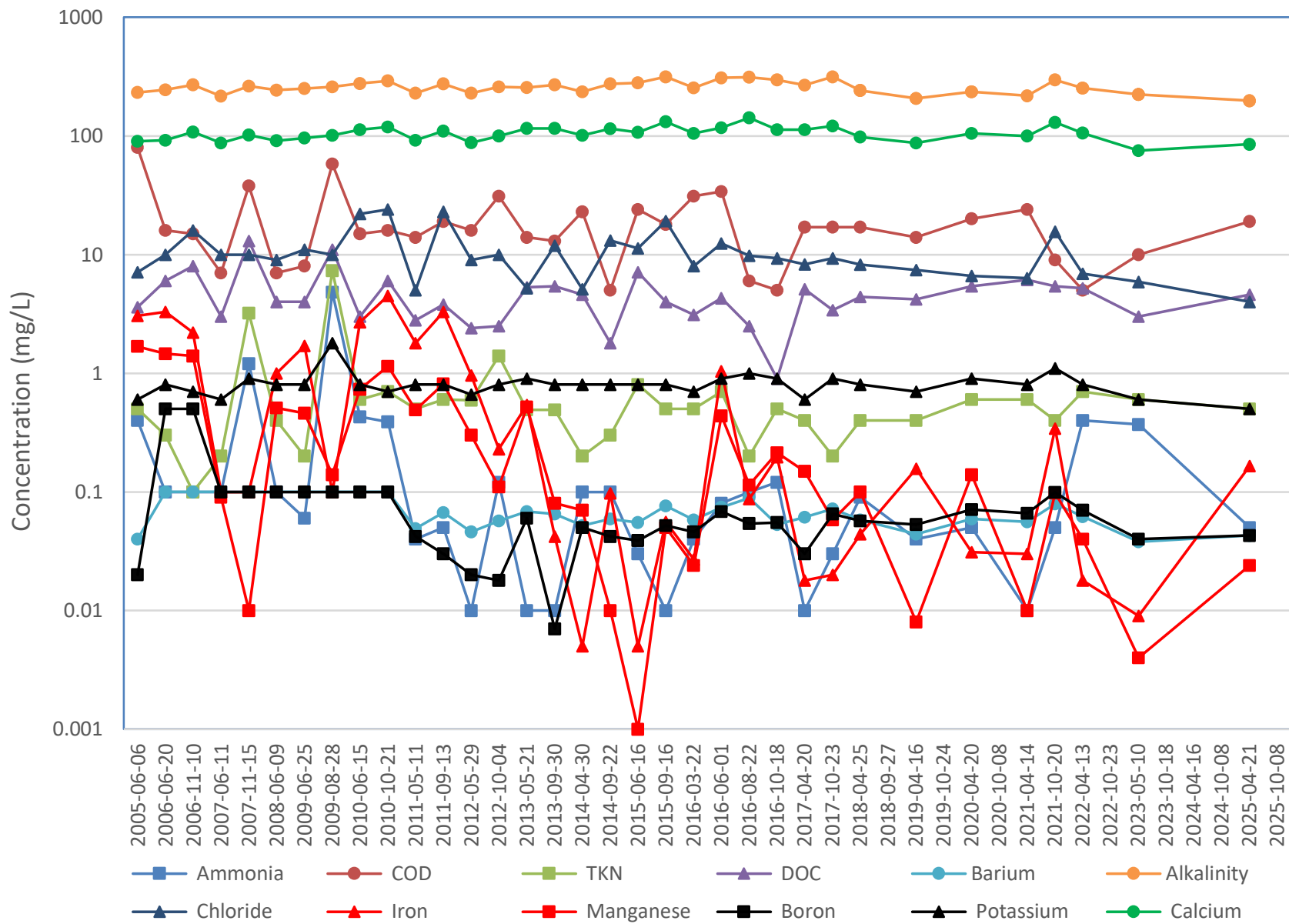
MW1-II

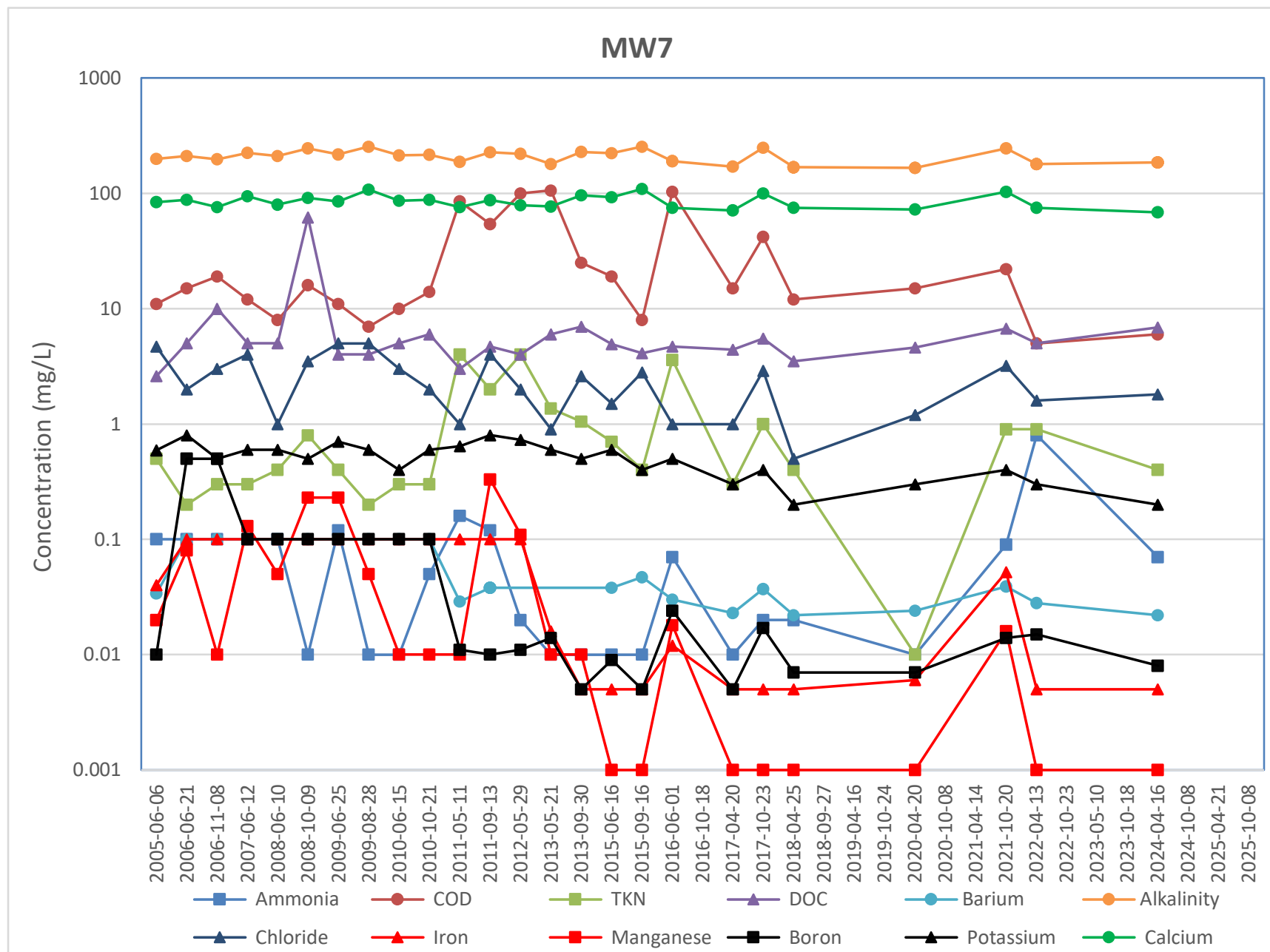


MW2-II

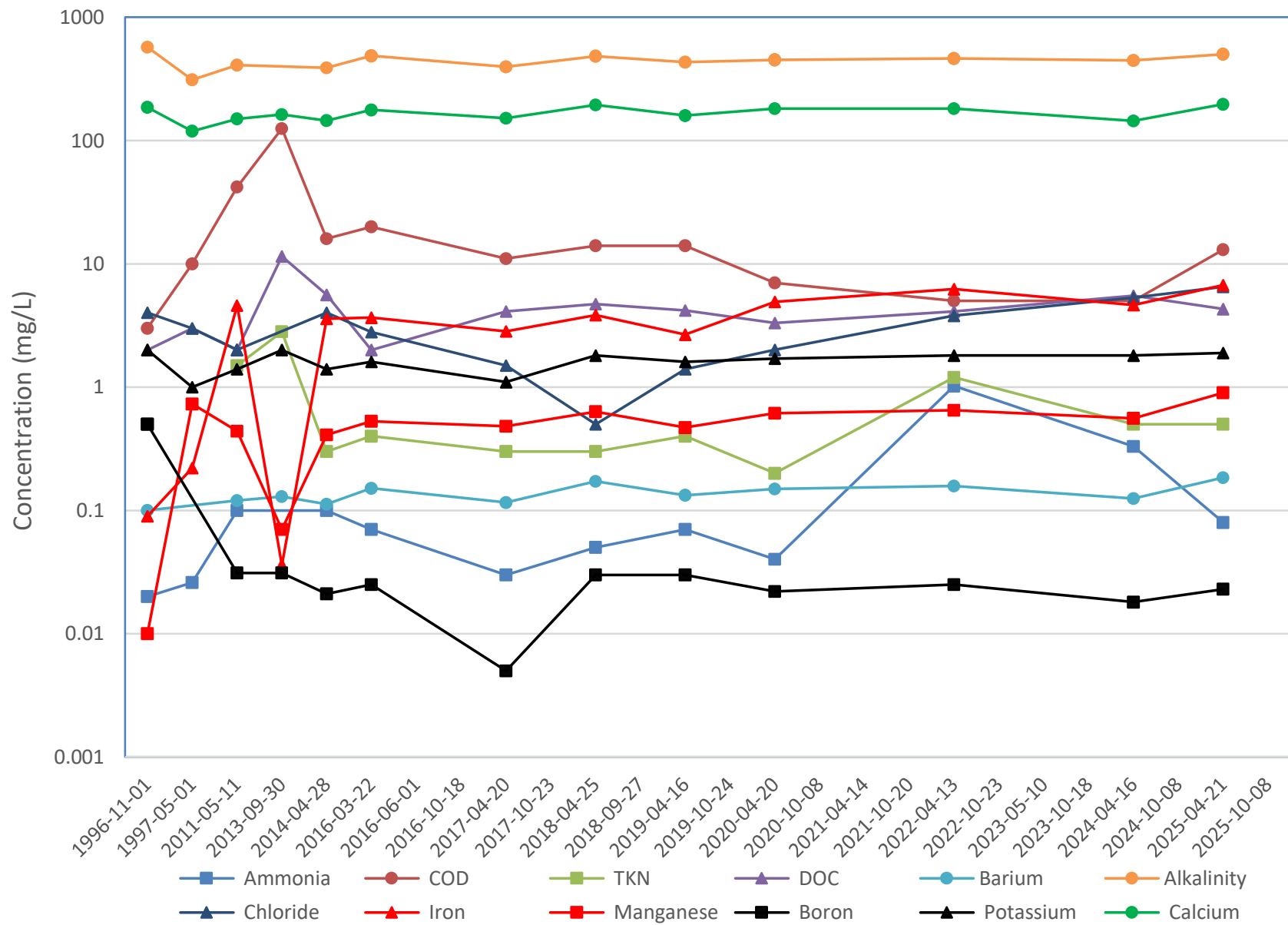


MW5-I

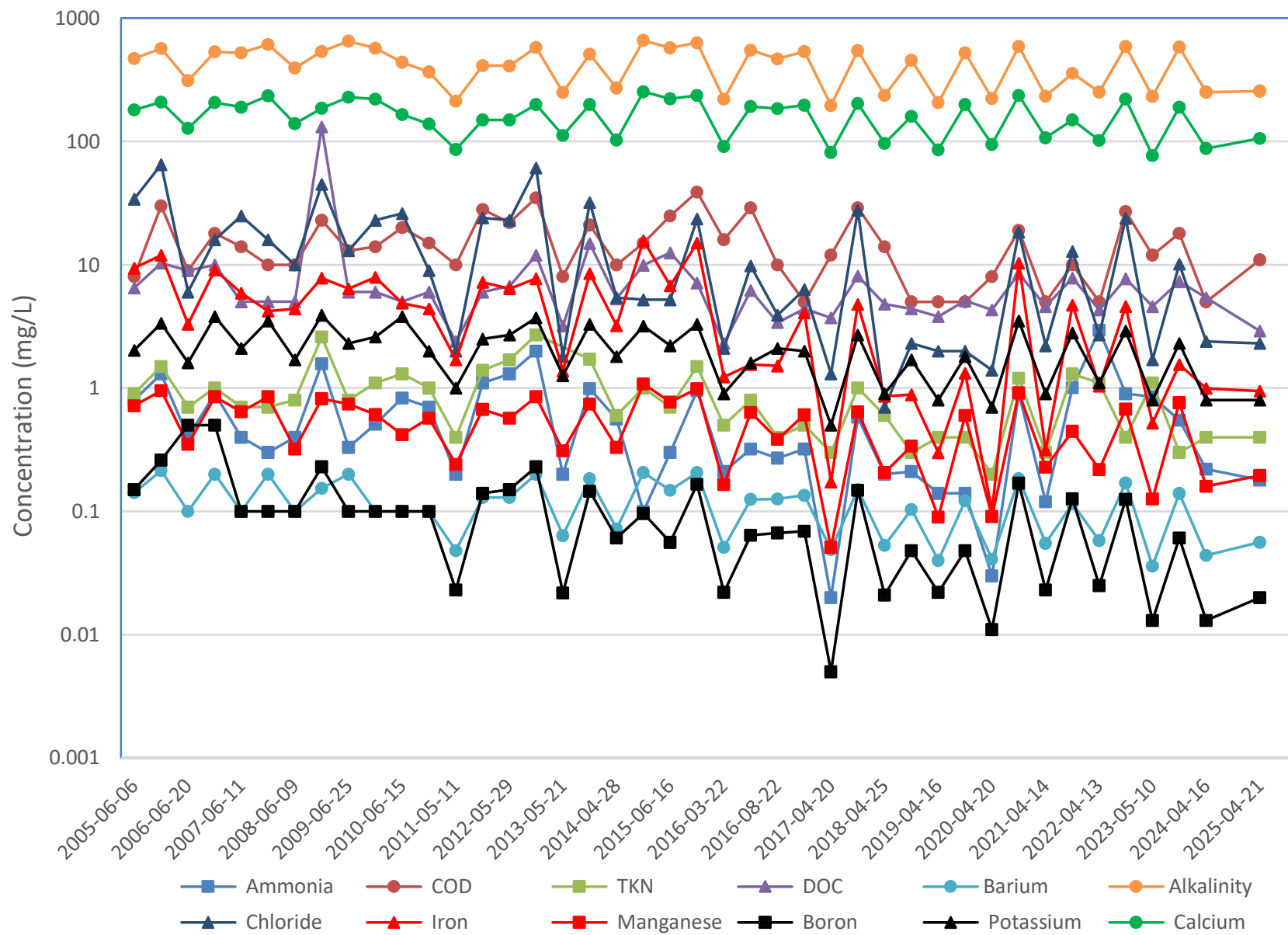




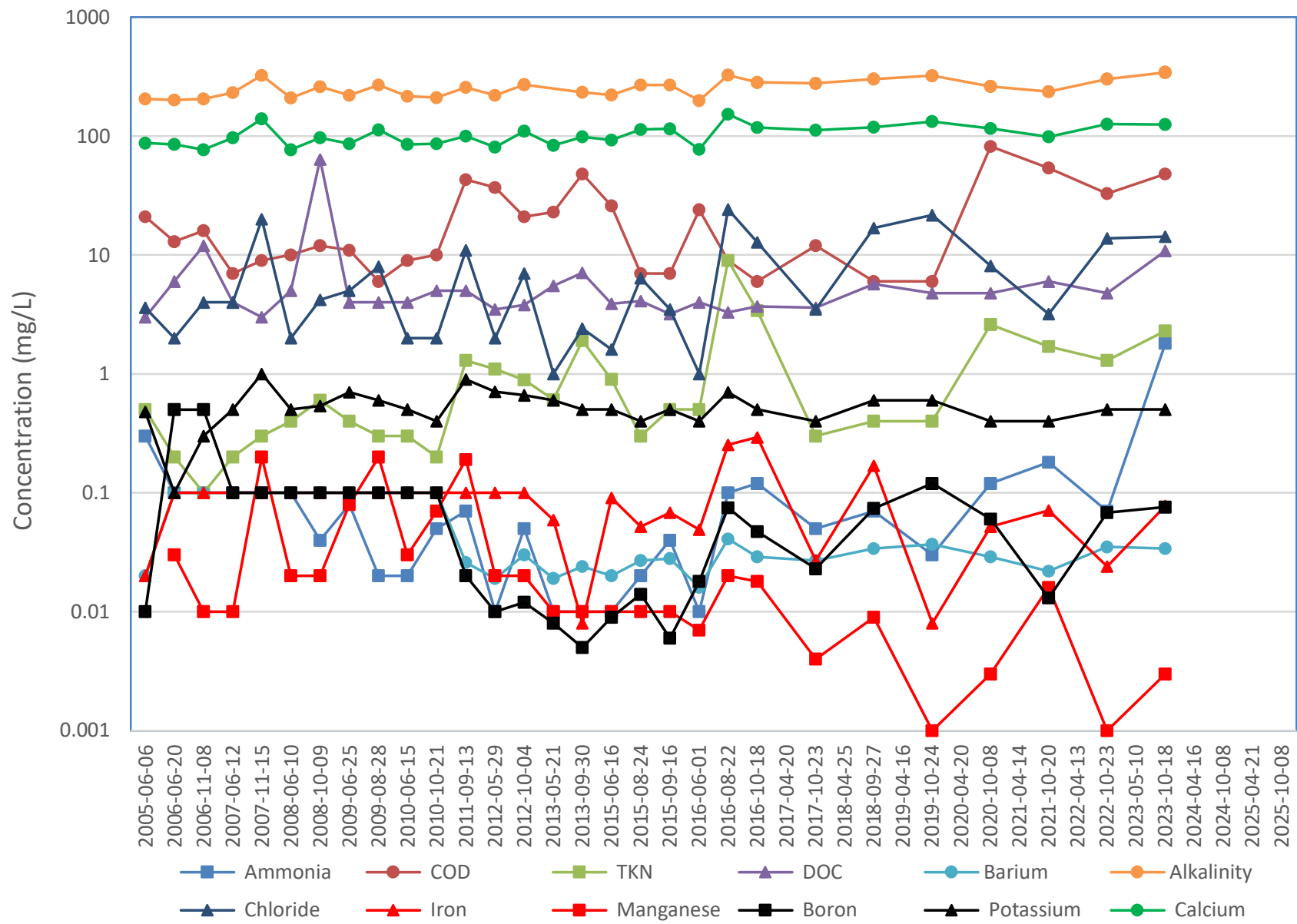
MW8-I



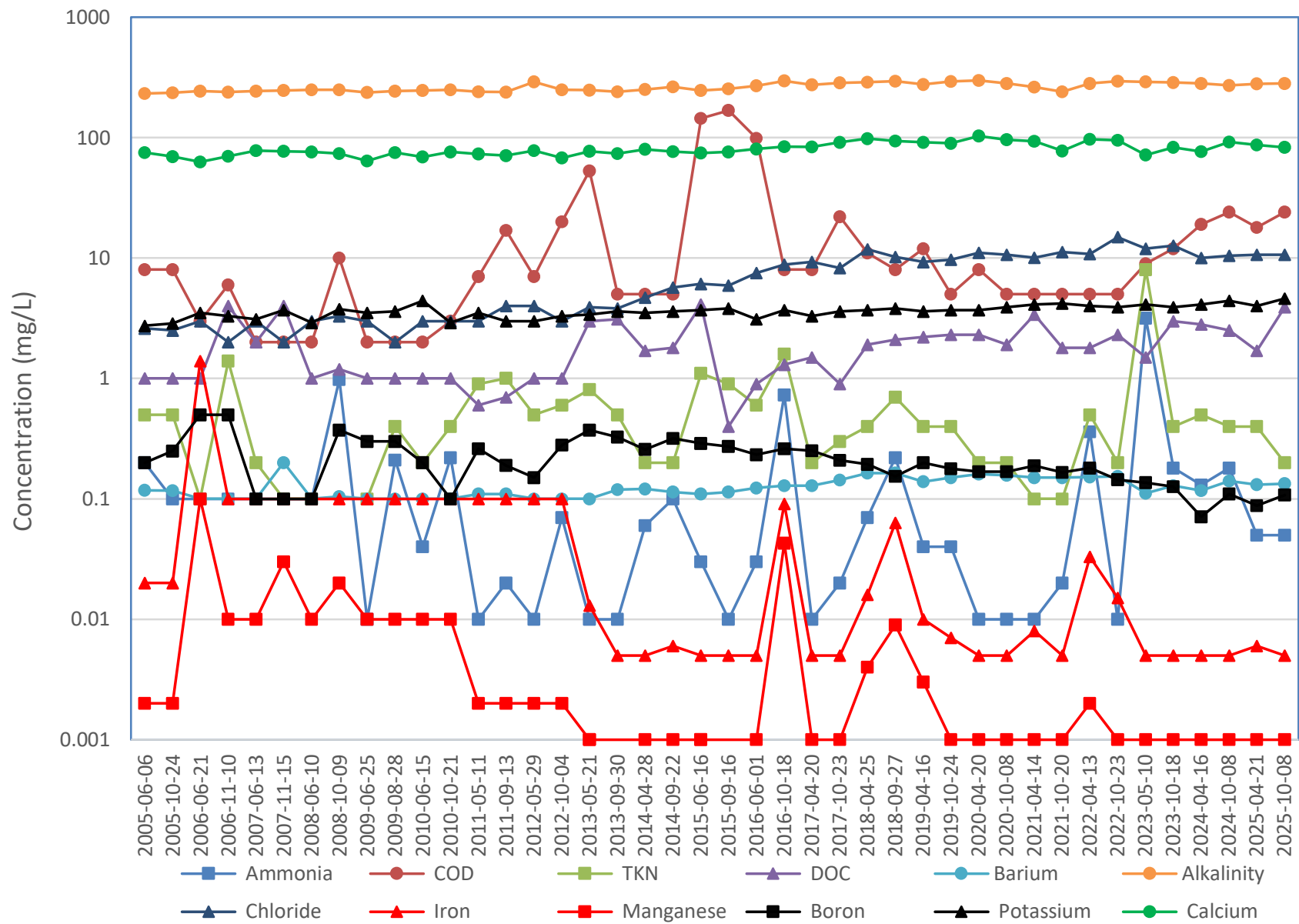
MW8-III



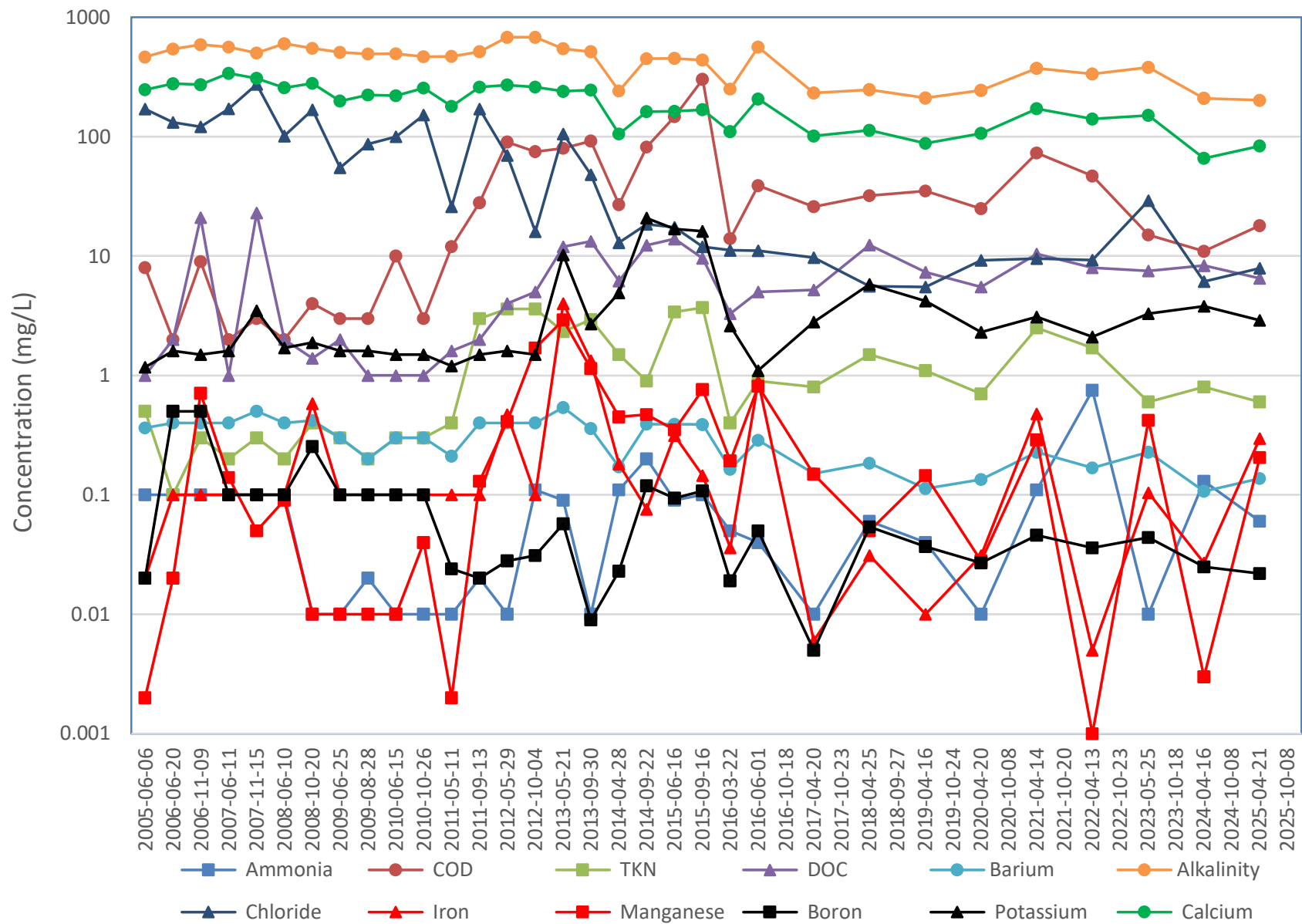
MW9



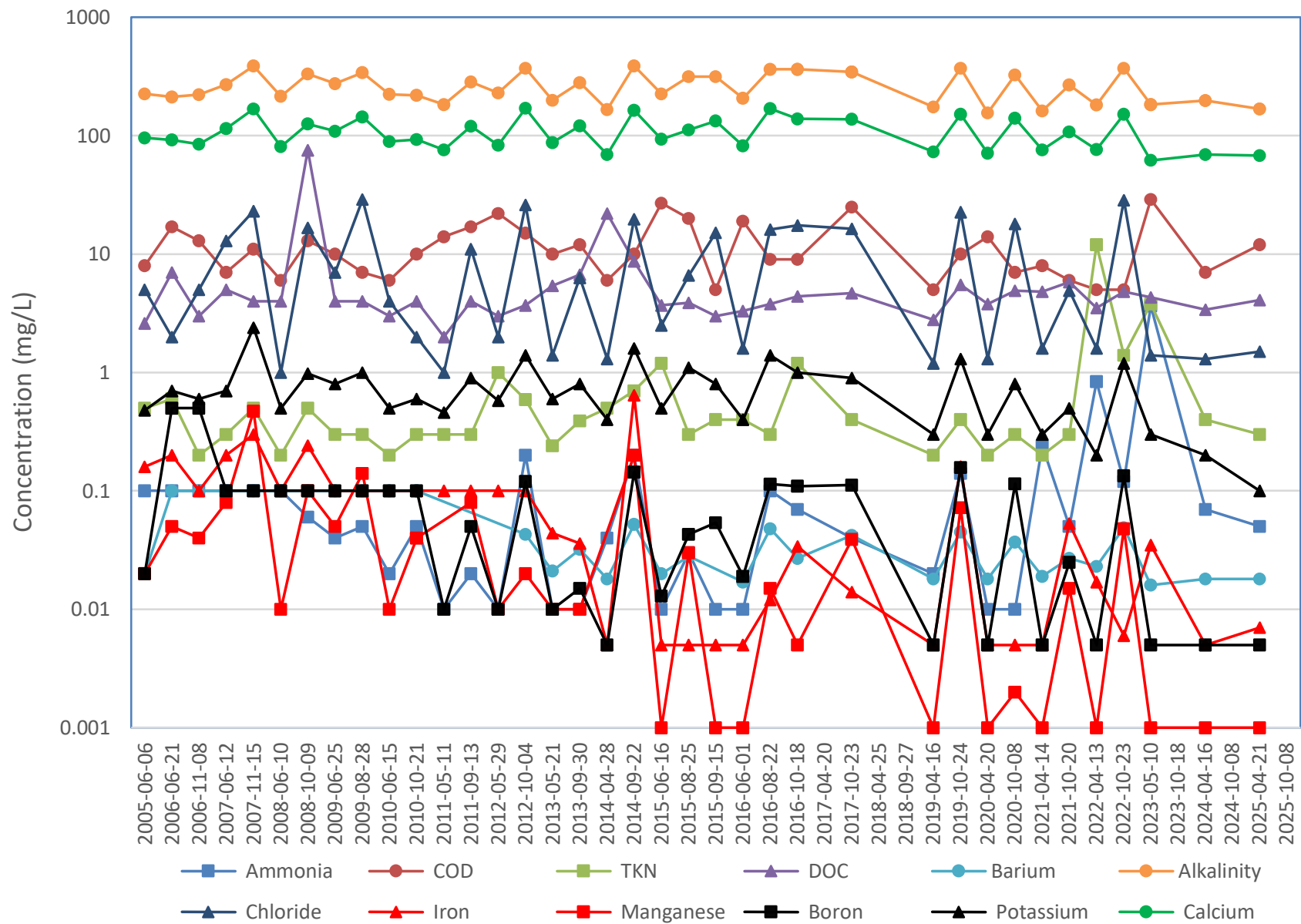
MW10-II



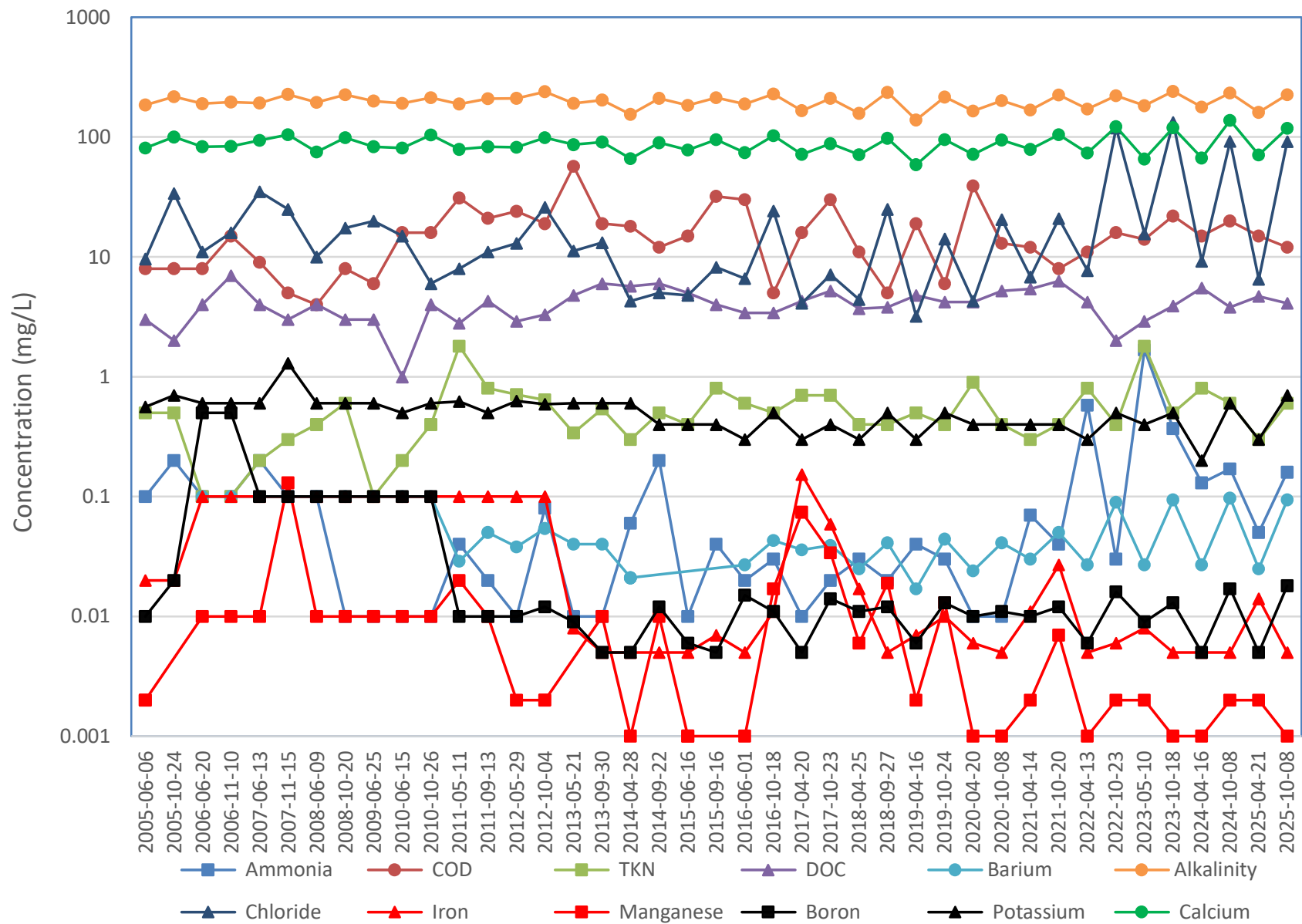
MW11



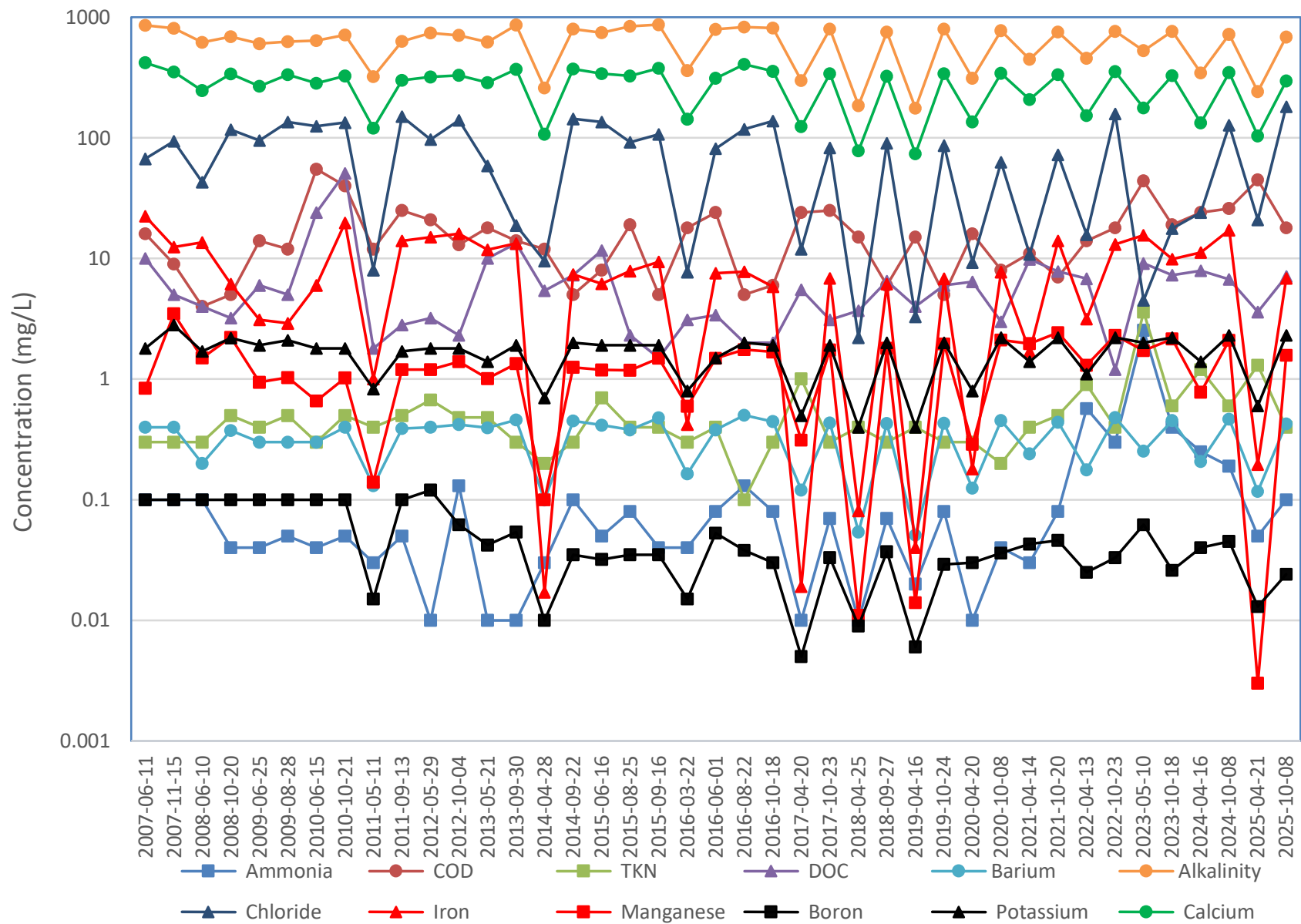
MW12



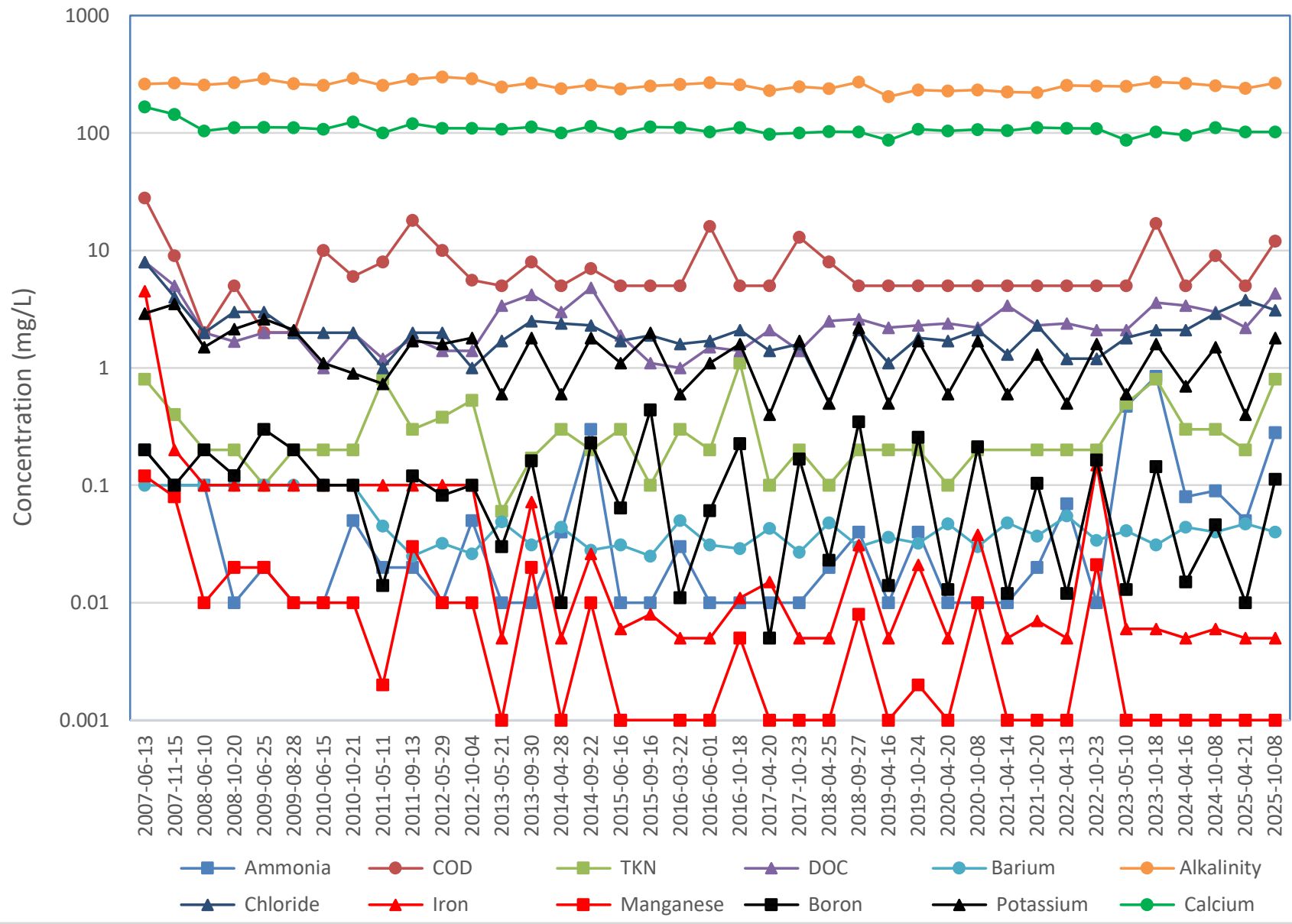
MW13



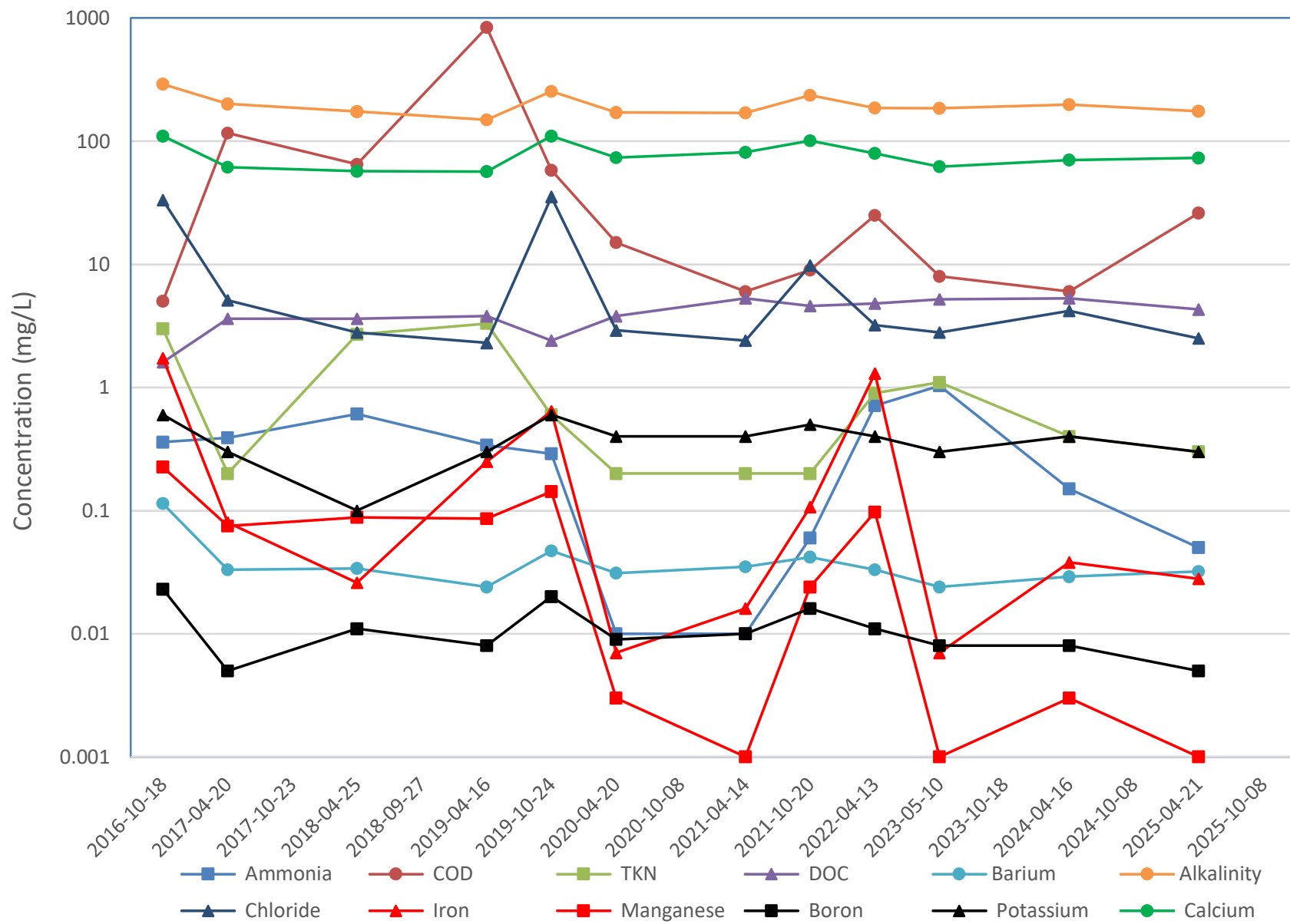
MW14

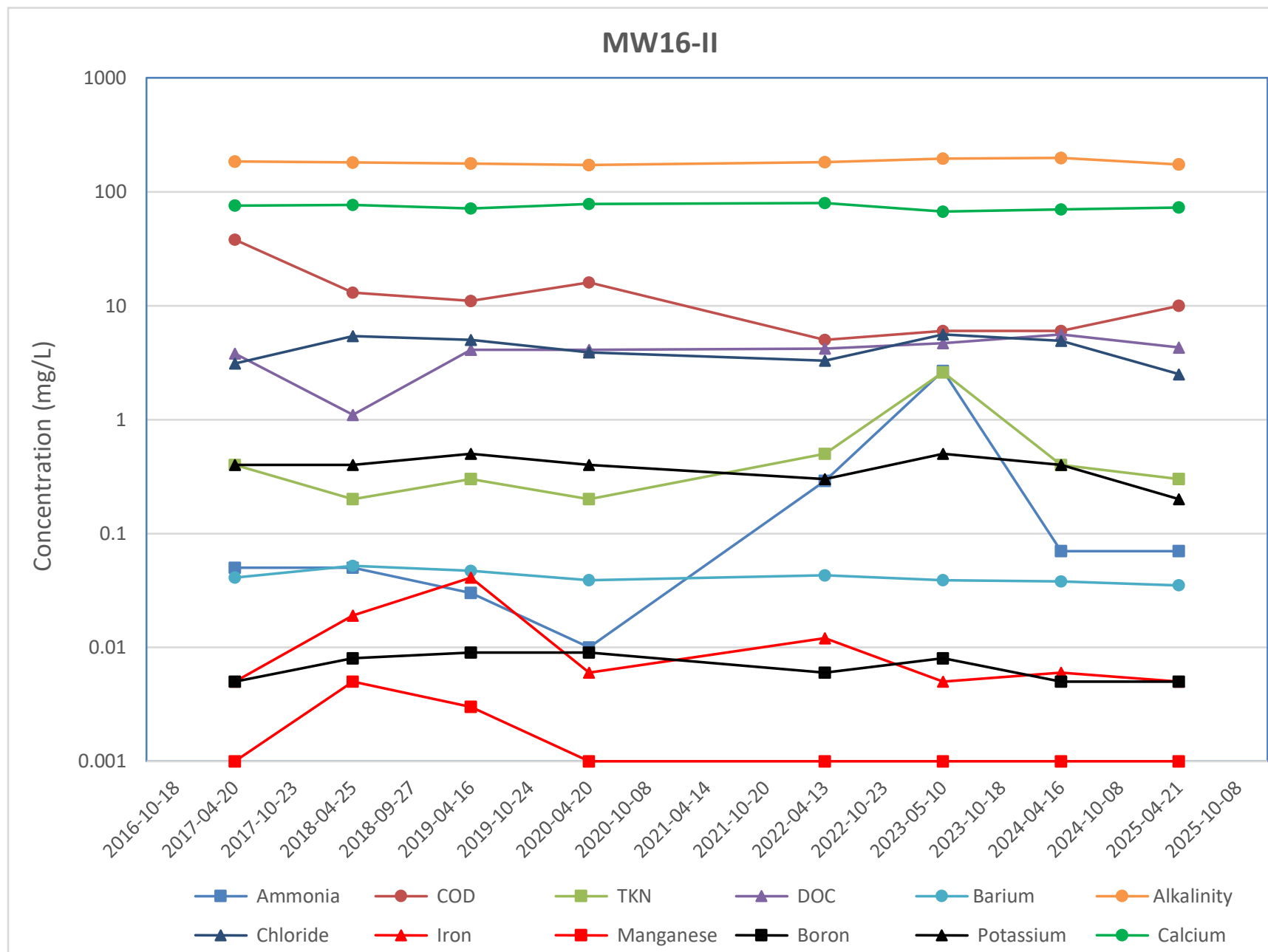


MW15

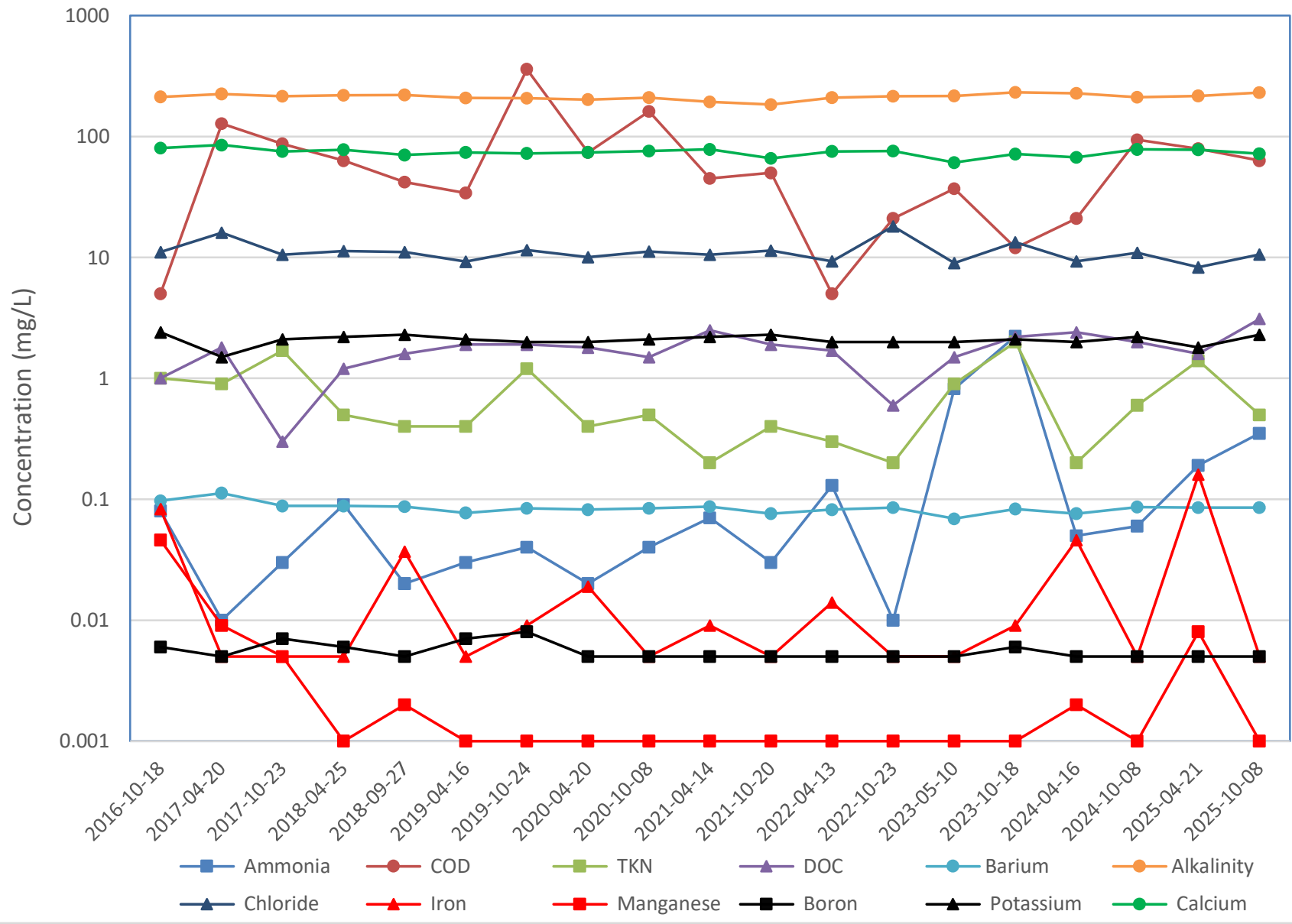


MW16-I

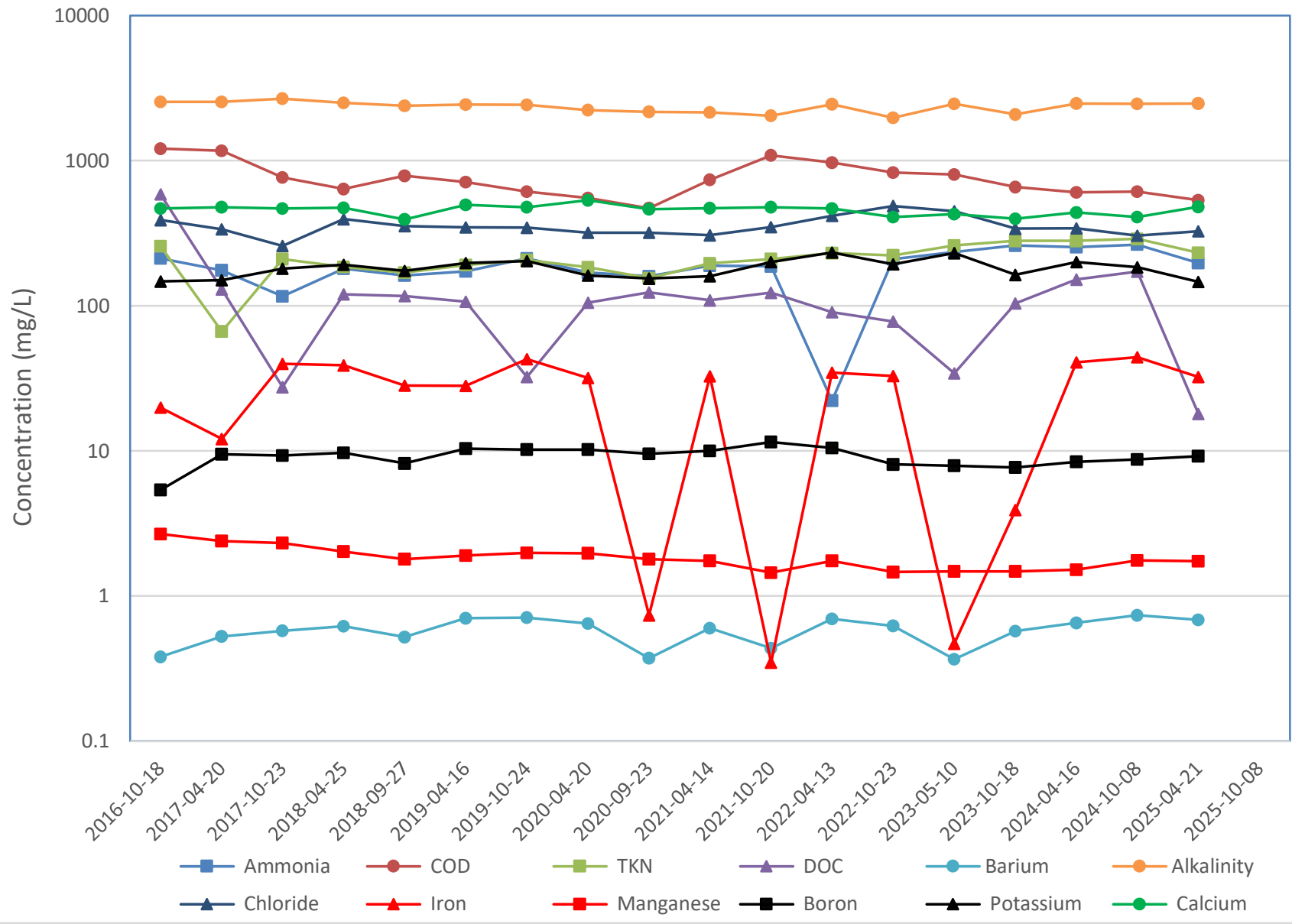




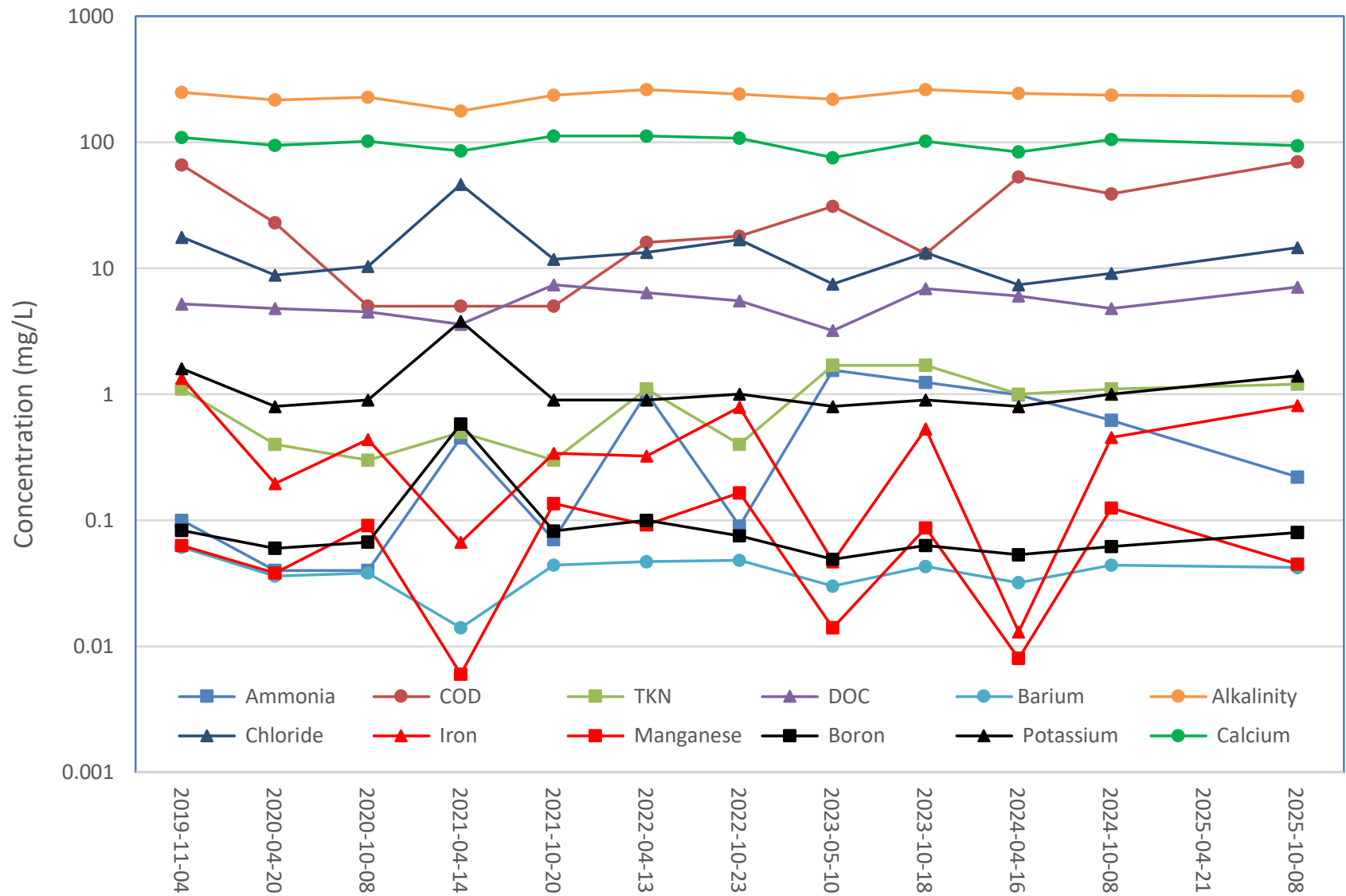
MW16-III



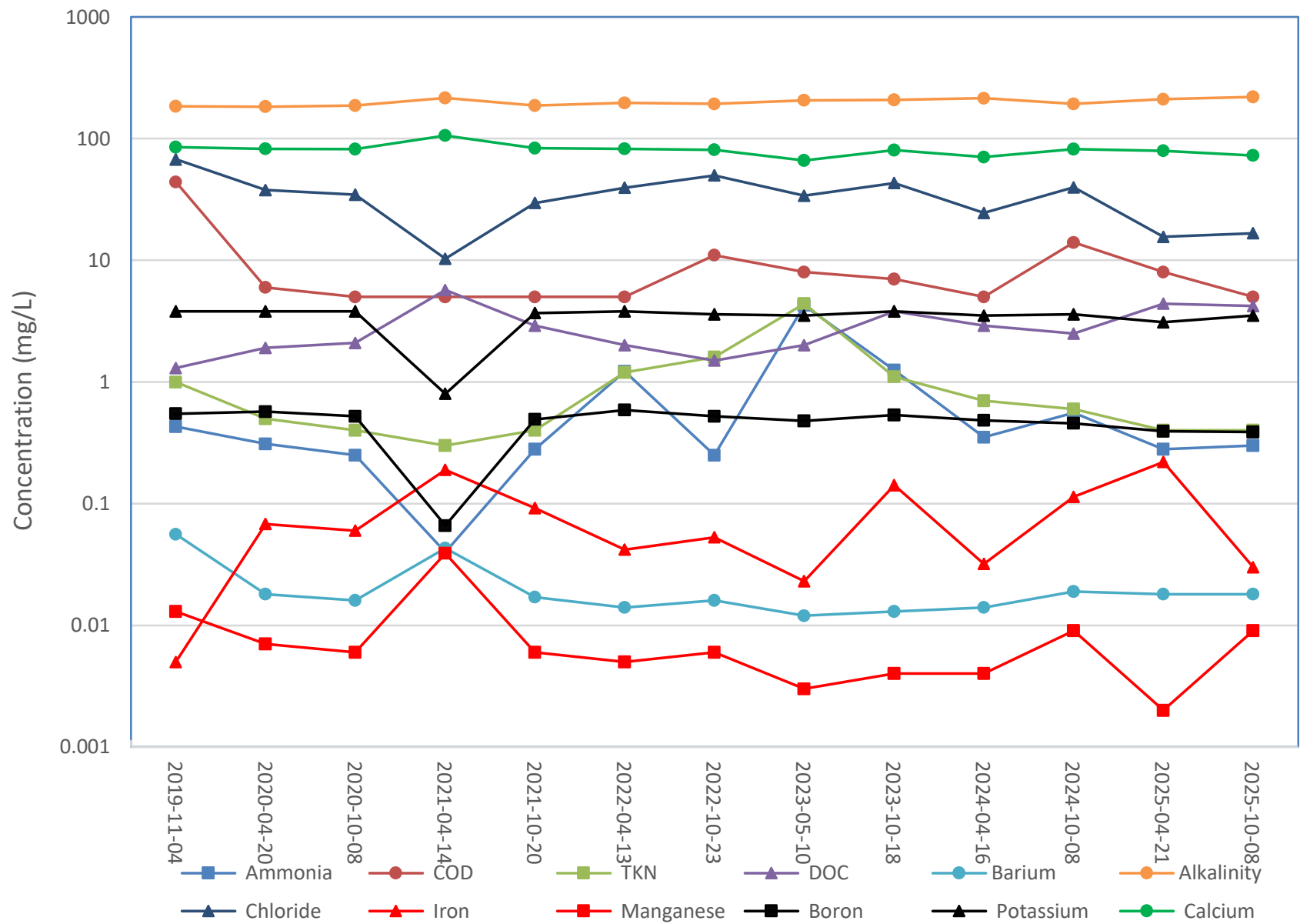
MW17



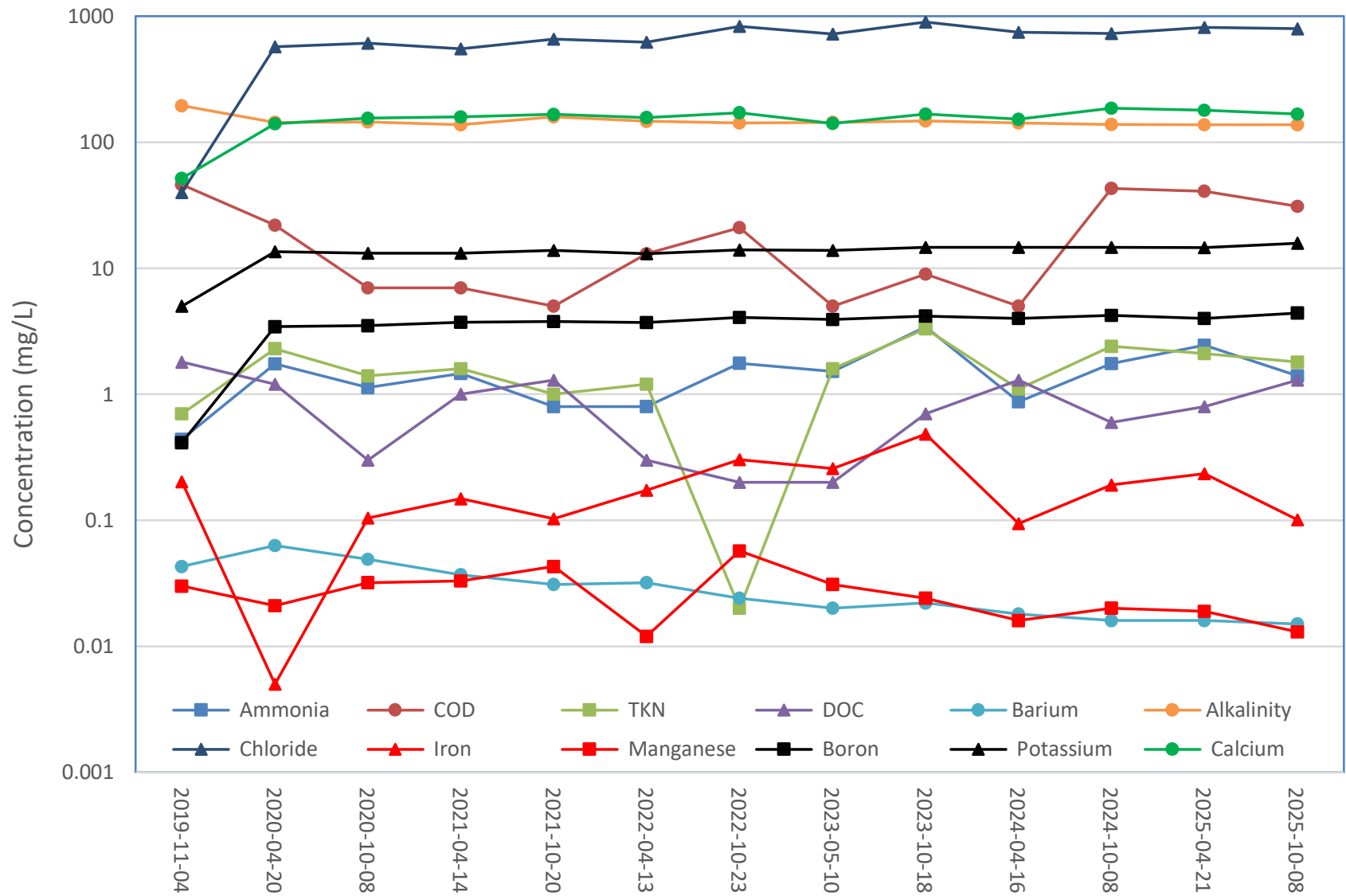
MW201D



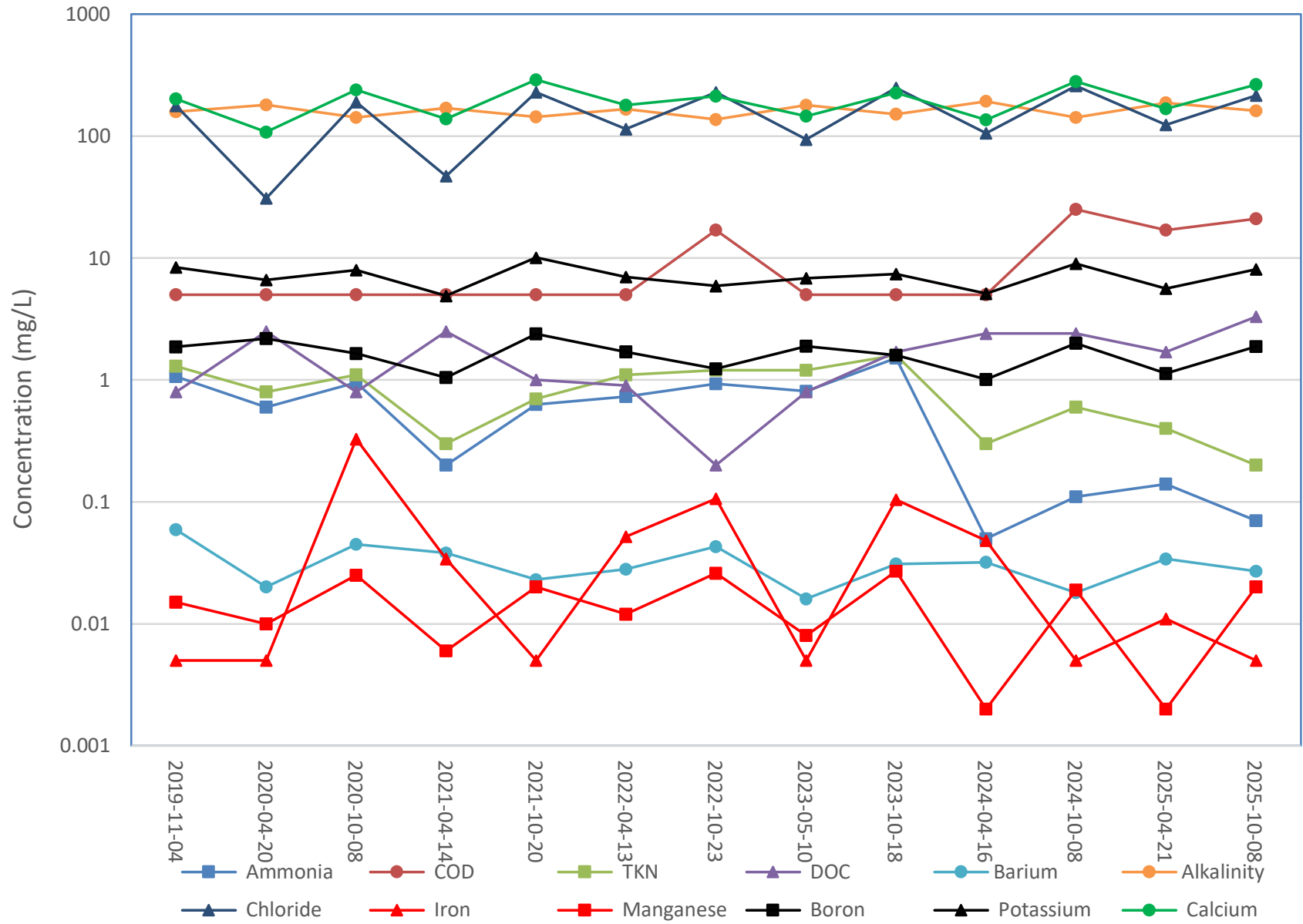
MW202



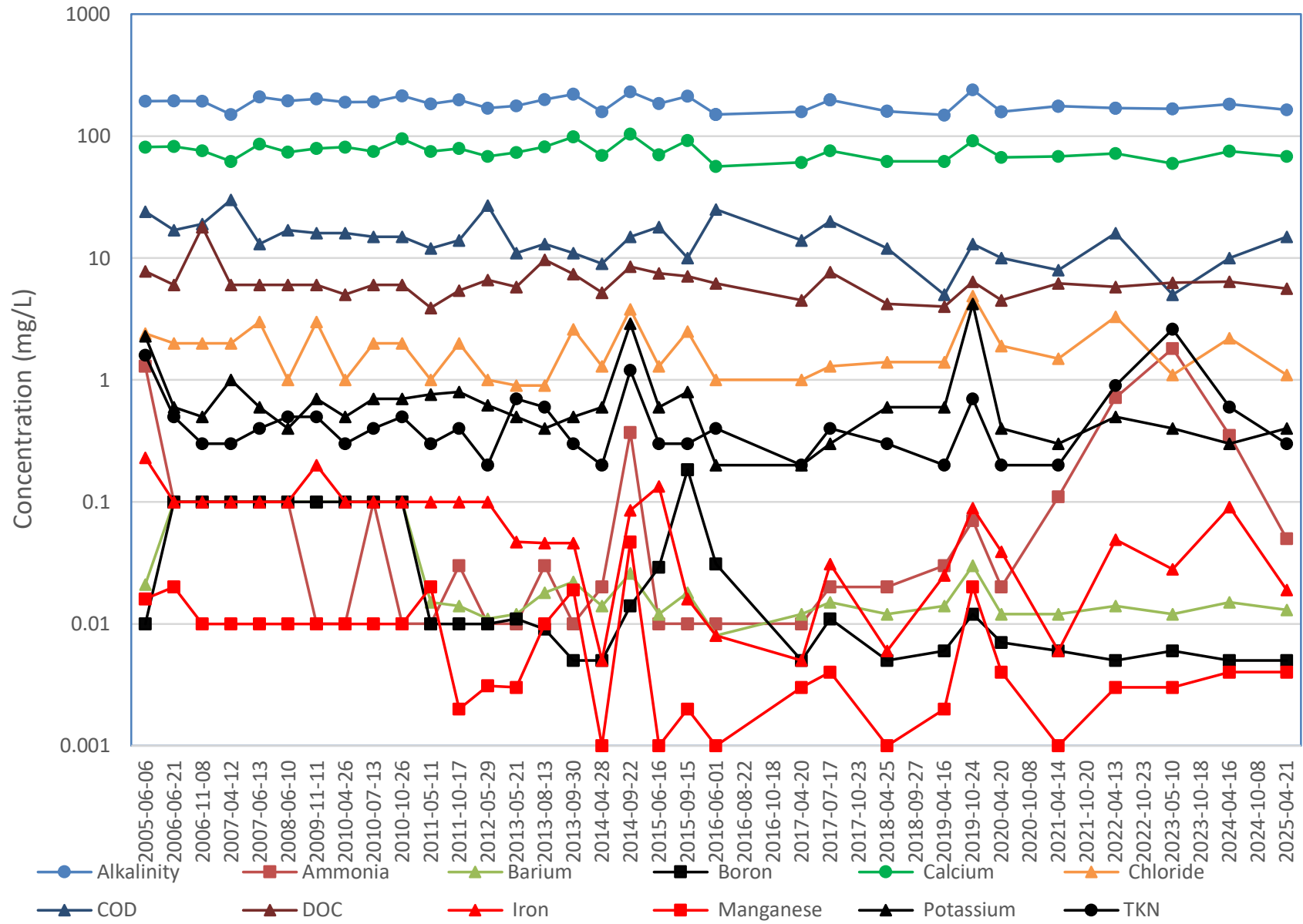
MW203



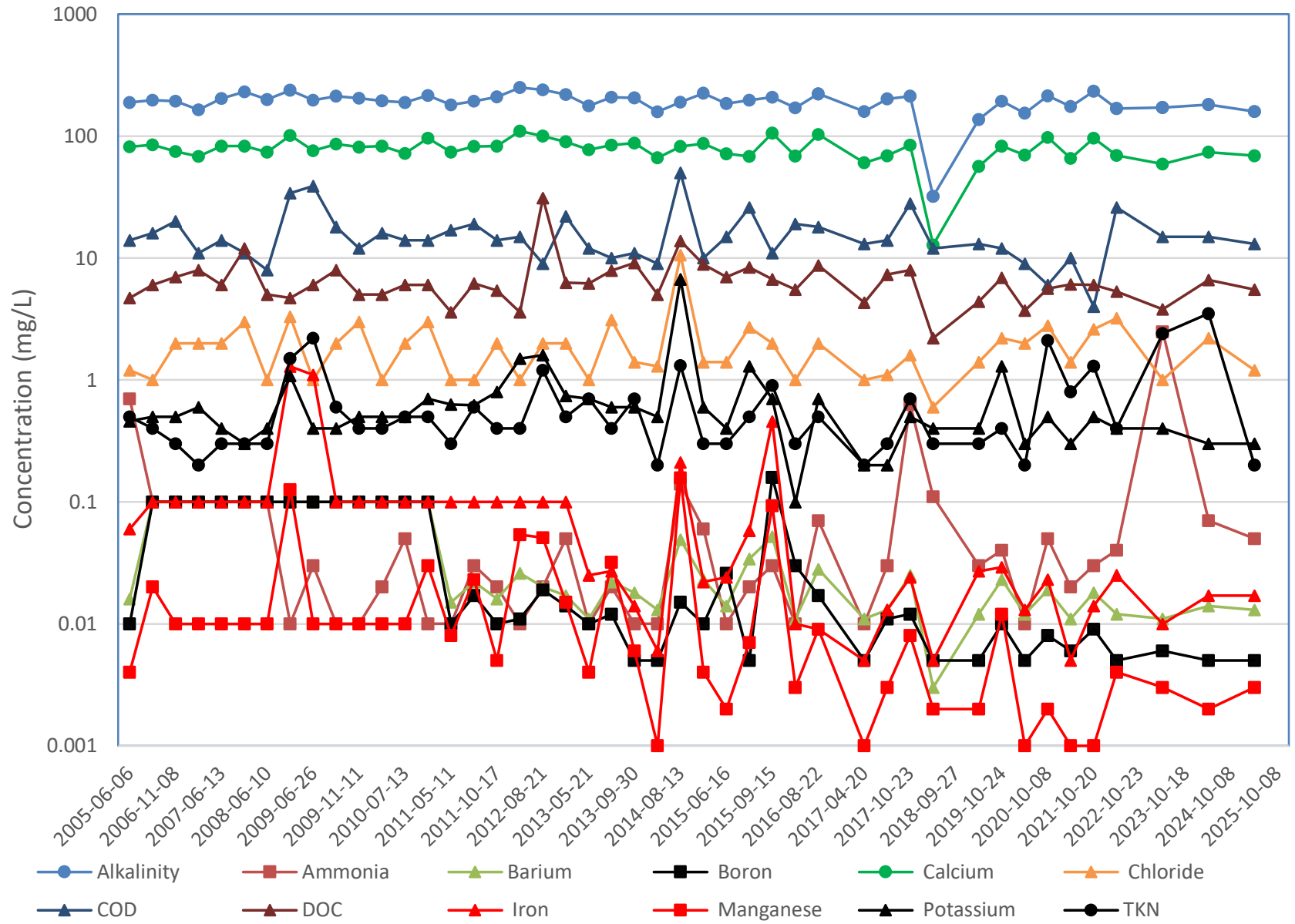
MW204



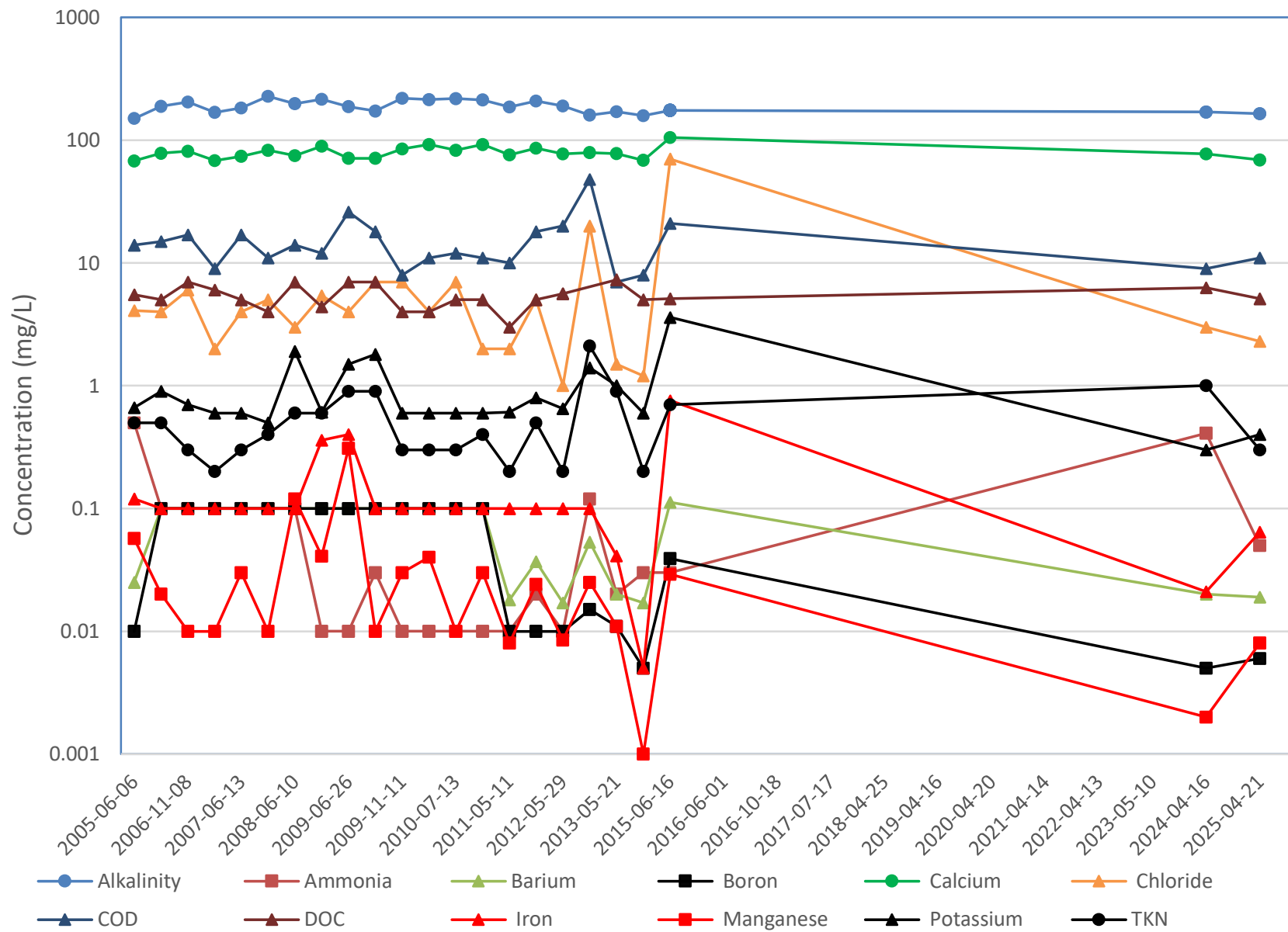
SWA



SWB



SWD





APPENDIX G

Surface Water Photos



26-010 – 2025 Somerville Landfill Monitoring Report



SW-A: April 2025



SW-A: October 2025



SW-B: April 2025



SW-B: October 2025



SW-D: April 2025



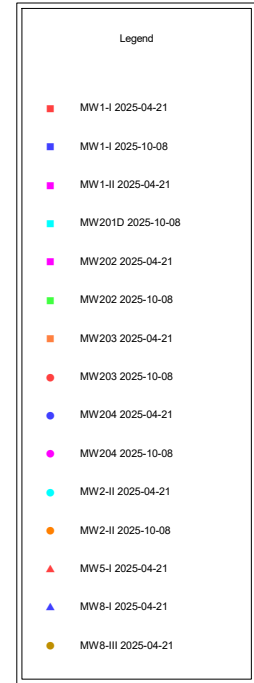
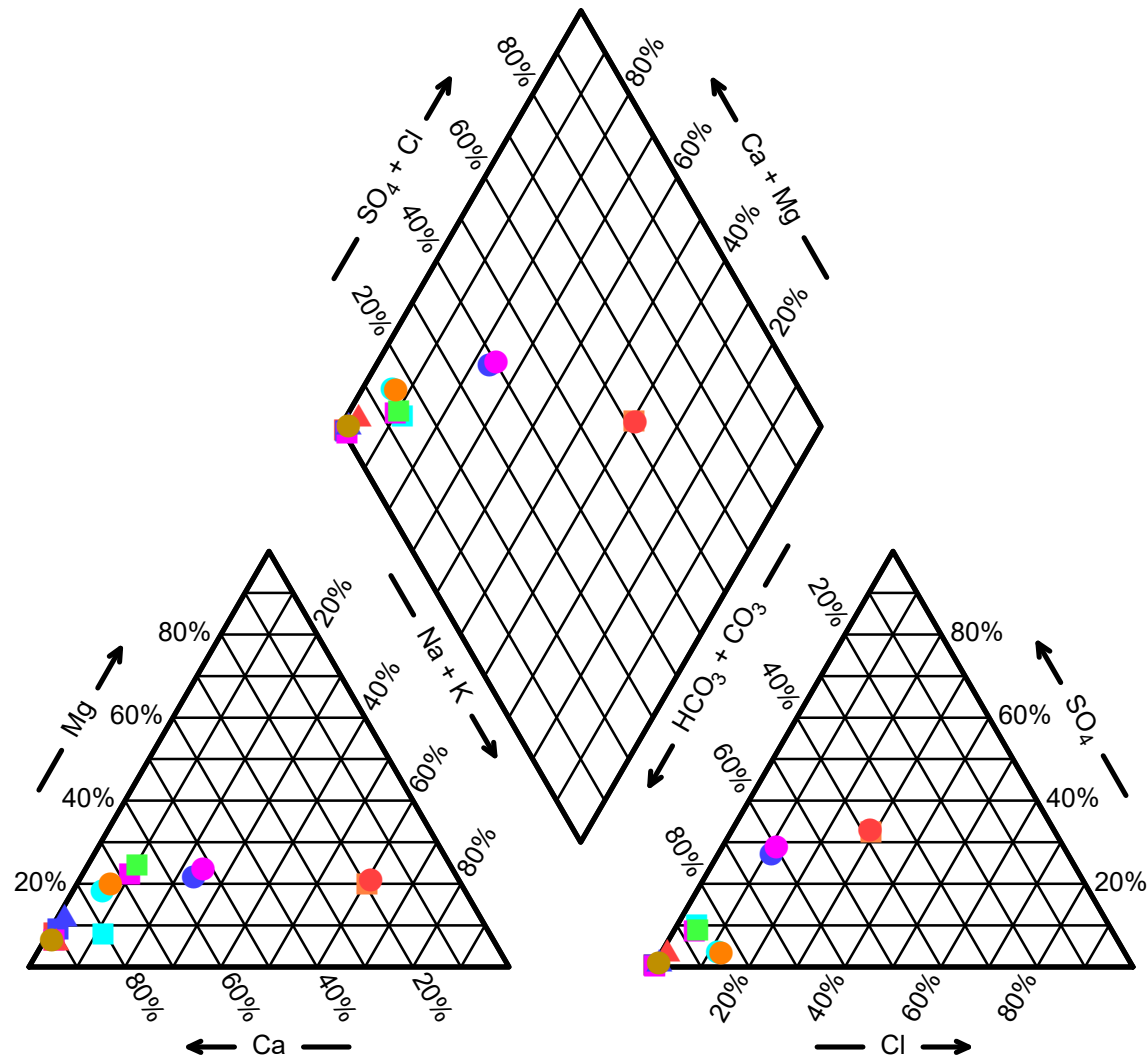
SW-D: October 2025



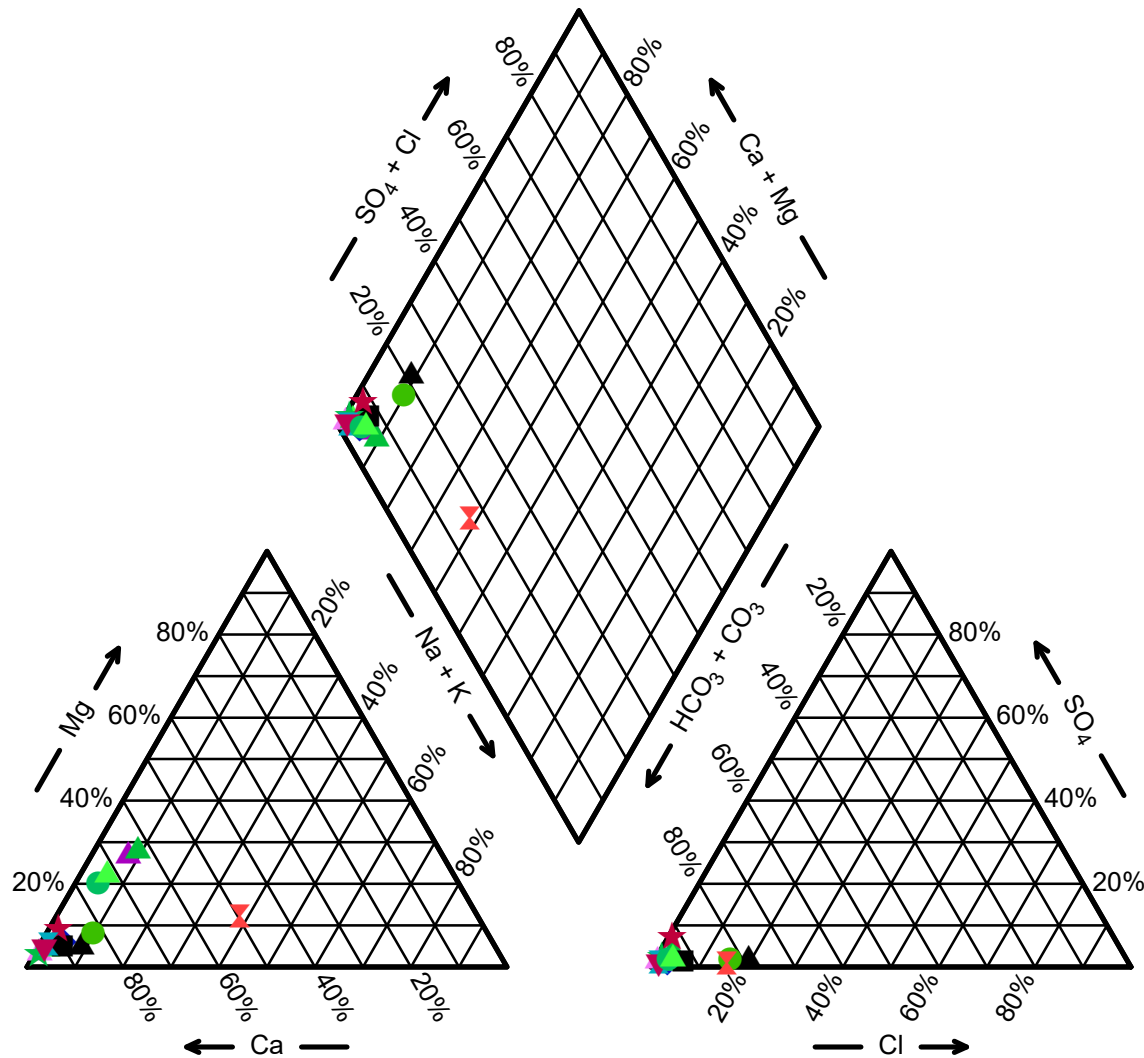
APPENDIX H

Graphical Analysis

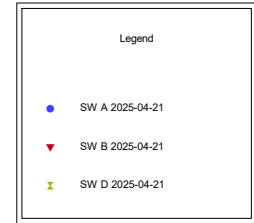
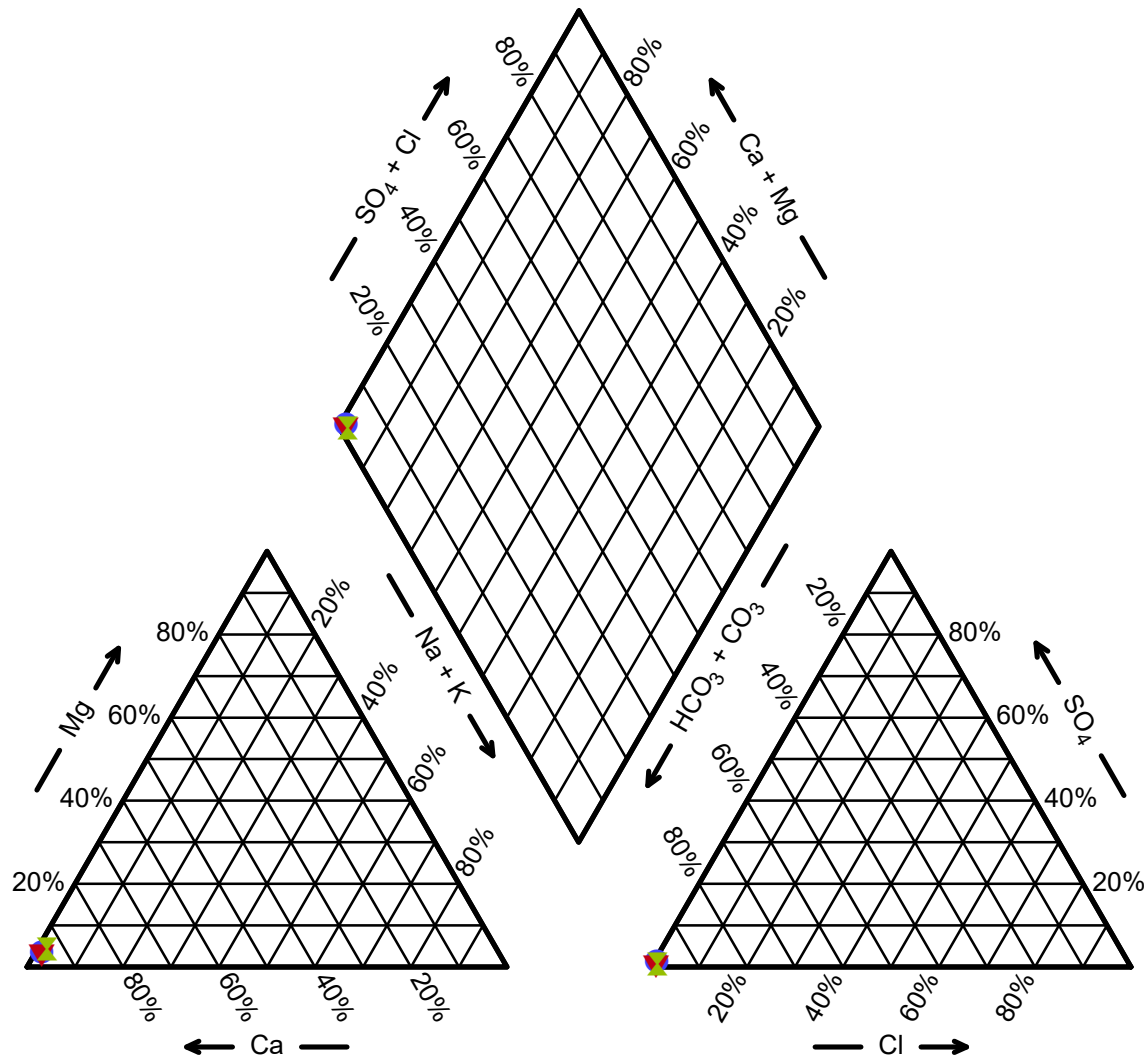
Groundwater Piper Diagram



Groundwater Piper Diagram



Surface Water Piper Diagram





APPENDIX I

Landfill Gas Summary Table

**Sommerville
Landfill Gas
Summary Table**

Monitoring Location	26-Feb-15		22-May-15		30-Nov-15		22-Feb-16		01-Jun-16		18-Oct-16		07-Feb-17		20-Apr-17	
	%VOL	%LEL	%VOL	%LEL	%VOL	%LEL	%VOL	%LEL	%VOL	%LEL	%VOL	%LEL	%VOL	%LEL	%VOL	%LEL
MW1-I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW1-II	0	0	0	0	18	>UEL	0	0	0	0	0	0	0	0	-	>100
MW2-II	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW5-I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<0.1	0
MW7	1	20	0	0	1	20	0	0	0	0	0	0	0	0	0	0
MW8-I	0	0	0	0	11	>LEL	2	40	0	0	0	0	0	0	0	0
MW8-III	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW9	0	0	1	20	0	0	0	0	0	0	0	0	-	-	0	0
MW10-II	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
MW11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW12	-	-	0	0	-	-	0	0	0	0	0	0	0	0	0	0
MW13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW14	0	0	0	0	0	0	0	0	2	40	0	0	0	0	0	0
MW15	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW16-I	-	-	-	-	-	-	-	-	-	-	<0.1	0	0	0	0	0
MW16-II	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0
MW16-III	-	-	-	-	-	-	-	-	-	-	0	0	0	0	<0.1	0
MW17	-	-	-	-	-	-	-	-	-	-	<0.1	0	34	>100	-	>100
GP-1	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	-
GP-2	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	-

Sommerville Landfill Gas Summary Table

[illegible]

Sommerville Landfill Gas Summary Table

[illegible]

**Sommerville
Landfill Gas
Summary Table**

Monitoring Location	08-Oct-24		21-Apr-25		08-Oct-25	
	%VOL	%LEL	%VOL	%LEL	%VOL	%LEL
MW1-I	0	0	0	0	0	0
MW1-II	max reading		max reading		max reading	
MW2-II	<0.1	0	0	0	0	0
MW5-I	0	0	0	0	0	0
MW7	0	0	0	0	0	0
MW8-I	0	0	0	0	0	0
MW8-III	0	0	0	0	0	0
MW9	0	0	0	0	0	0
MW10-II	0	0	0	0	0	0
MW11	0	0	<0.1	0	0	0
MW12	0	0	<0.1	0	0	0
MW13	0	0	0	0	0	0
MW14	0.4	9	<0.1	0	0.12	2
MW15	0	0	0	0	0	0
MW16-I	0	0	0	0	0	0
MW16-II	0	0	0	0	0	0
MW16-III	0	0	0	0	0	0
MW17	max reading		max reading		max reading	
GP-1	<0.1	0	0	0	0	0
GP-2	0	0	0	0	0	0



APPENDIX J

Site Inspections

CITY OF KAWARTHA LAKES
OPERATING LANDFILL INSPECTION FORM

LANDFILL: SOMERVILLE WDS

LANDFILL TYPE

Inspected by: BAAD PETERSONE

Date: APRIL 21, 2025

Time: 13:15

Weather Conditions: RAIN, 6°C

A. GENERAL OBSERVATIONS

A.1 Landfill Site: OPERATING, GENERALLY NEAT & TIDY, ORGANIZED
@ TIPPING FACE. LOTS OF BRUSH

A.2 Status of Landfill Development/Construction Activities: ACTIVE

A.3 Tipping Face: GOOD, MAINTAINED BY 2 STAFF @ TIME
OF INSPECTION

A.4 Residential Container Station: N/A

A.5 Maintenance and Administration Building: N/A

A.6 Weigh Scale Inspection Building: OK

A.7 Reuse Centre: N/A

A.8 HHW Facility: N/A

A.9 Leaf & Yard Waste Composting Facility: OK, Very Full, Lots of Brush
AND MOST DROP OFFS APPEARED TO BE FOR THAT SERVICE.

B. STAFFING:

B.1 Is staffing for the landfill operations and ancillary landfill operations (i.e., HHW Facility, Reuse Centre Leaf & Yard Waste Composting Facility) adequate? _____

YES, OK

B.2 Are staff wearing adequate safety equipment? YES

C. LANDFILL COVER:

C.1 Any evidence of leachate seeps or erosion of landfill cover on waste disposal fill area? _____

NO

C.2 Condition of ~~North~~ Slope? STABLE

C.3 Condition of vegetation? None, but NO FINAL COVER APPLIED.

D. STORM WATER MANAGEMENT SYSTEM:

D.1 Is the surface water management system in good operating order? (e.g. any erosion, litter, debris of the perimeter stormwater ditches or stormwater sedimentation ponds? Are culverts free from debris? _____

POND FULL, FLOODING.

E. LEACHATE COLLECTION SYSTEM

E.1 Are manholes free of litter and debris? _____

N/A

E.2 Condition of manholes/need repairs? _____

F. MAIN ENTRANCE AND INTERNAL ROADS:

F.1 Is the main entrance or internal roads in need of repair or maintenance work? _____

No

G. DUST CONTROL:

G.1 Any dust problems because of the internal roads, working face or fill stockpiles? _____

No

G.2 Condition of Roads: Good

H. ODOURS:

H.1 Any odour problems? NOT AT TIME OF INSPECTION

I. LITTER CONTROL:

I.1 Any evidence of litter on the landfill buffer area site fencing, along Wilson Road, on adjacent properties or around the residential container station? _____

SOME BLOWN REFUSE IN WOODED AREA NORTH AND WEST OF SITE

J. LANDSCAPING:

J.1 Does the landscaping (trees, shrubs, and ground cover) require maintenance work (e.g. grass cutting, replacement or vegetation)?

SOME FALLEN TREES NEAR ACCESS POINTS FOR MONITORING

K. SITE PERIMETER FENCING AND SIGNING:

K.1 Is the site perimeter fencing in good condition? YES.

K.2 Are the traffic and information signs in good condition? YES.

L. LANDFILL OPERATIONS:

L.1 Is there sufficient material for daily and interim cover? YES.

L.2 Is the landfill operations equipment in good working order? Assumed YES.

L.3 Is the waste being spread, compacted and covered in accordance with the Maintenance & Operations Report?

YES, OBSERVED.

M. SITE SECURITY AND SAFETY PROTOCOLS

M.1 Are waste loads being adequately inspected (weigh scale/inspection building, residential container station, tipping face)? _____

YES

M.2 Are there sufficient fire extinguishers (fully loaded and operable) at tipping face, weigh scale/inspection building, maintenance and administration building, HHW Facility, Reuse Centre? _____

UNKNOWN

M.3 Location and condition of medical emergency kits (eye wash stations and first aid kits): _____

UNKNOWN

M.4 Staff knowledge of emergency procedures/numbers? _____

UNKNOWN

N. OTHER COMMENTS:

+ MW-9 - SUBMERGED, MW-7 FLOODED.

+ FALLEN TREE OVER MW-14 + MW-11

O. RECOMMENDATIONS:

+ CONSIDER REDRILLING MW-9 FARTHER WEST FOR YEARROUND

ACCESS ON DAY LAND, NOT IN POND FOOTPRINT

+ REMOVE FALLEN TREES @ MW-14 + MW-11

+ CLEAN REFUSE IN WOODEN AREAS.

CITY OF KAWARTHA LAKES
OPERATING LANDFILL INSPECTION FORM

LANDFILL: SOMERVILLE LANDFILL

Inspected by: BRAD PETERSON

Date: OCTOBER 8, 2025

Time: 16:30

Weather Conditions: SUN, COOL, $\approx 10^{\circ}\text{C}$

A. GENERAL OBSERVATIONS

A.1 Landfill Site: SITE CLOSED DURING INSPECTION

A.2 Status of Landfill Development/Construction Activities: ACTIVE, SOME

CHANGES NOTED IN WASTE AREA AND FUTURE CELLS.

A.3 Tipping Face: GOOD, COVERED

A.4 Residential Container Station: GOOD

A.5 Maintenance and Administration Building: Good

A.6 Weigh Scale Inspection Building: Closed, Good

A.7 Reuse Centre: Good

A.8 HHW Facility: Closed, N/A

A.9 Leaf & Yard Waste Composting Facility: Good, very full

B. STAFFING:

B.1 Is staffing for the landfill operations and ancillary landfill operations (i.e., HHW Facility, Reuse Centre Leaf & Yard Waste Composting Facility) adequate? _____

Closed - Not Inspected

B.2 Are staff wearing adequate safety equipment? _____

Closed

C. LANDFILL COVER:

C.1 Any evidence of leachate seeps or erosion of landfill cover on waste disposal fill area? _____

NO, SOME POOLING WATER NOTED IN LOCATION OF NEW WASTE CELL,
WHICH IS CONTAINED.

C.2 Condition of ~~North~~ Slope? GOOD

C.3 Condition of vegetation? GRASSES, GOOD

D. STORM WATER MANAGEMENT SYSTEM:

D.1 Is the surface water management system in good operating order? (e.g. any erosion, litter, debris of the perimeter stormwater ditches or stormwater sedimentation ponds? Are culverts free from debris? _____

GOOD, NO PONDS ON SITE.

E. LEACHATE COLLECTION SYSTEM

E.1 Are manholes free of litter and debris? N/A

E.2 Condition of manholes/need repairs? N/A

F. MAIN ENTRANCE AND INTERNAL ROADS:

F.1 Is the main entrance or internal roads in need of repair or maintenance work? _____

NO, SITE IS GOOD.

G. DUST CONTROL:

G.1 Any dust problems because of the internal roads, working face or fill stockpiles? _____

NOT ACTIVE DURING INSPECTION.

G.2 Condition of Roads: GOOD - NO PROBLEMS NOTED.

H. ODOURS:

H.1 Any odour problems? NOT NOTED.

I. LITTER CONTROL:

I.1 Any evidence of litter on the landfill buffer area site fencing, along Wilson Road, on adjacent properties or around the residential container station? _____

SOME BAGS NOTED IN AREA BY WELLS MW-11 & MW-14,

LOOKS TO HAVE BEEN THROWN OVER FENCE FROM ROADSIDE

J. LANDSCAPING:

J.1 Does the landscaping (trees, shrubs, and ground cover) require maintenance work (e.g. grass cutting, replacement or vegetation)?

NO, ALL GOOD.

K. SITE PERIMETER FENCING AND SIGNING:

K.1 Is the site perimeter fencing in good condition? YES, GOOD.

K.2 Are the traffic and information signs in good condition? YES.

L. LANDFILL OPERATIONS:

L.1 Is there sufficient material for daily and interim cover? YES

L.2 Is the landfill operations equipment in good working order? YES

L.3 Is the waste being spread, compacted and covered in accordance with the Maintenance & Operations Report?

YES

M. SITE SECURITY AND SAFETY PROTOCOLS

M.1 Are waste loads being adequately inspected (weigh scale/inspection building, residential container station, tipping face)?

CLOSED - NOT INSPECTED

M.2 Are there sufficient fire extinguishers (fully loaded and operable) at tipping face, weigh scale/inspection building, maintenance and administration building, HHW Facility, Reuse Centre?

CLOSED - NOT INSPECTED

M.3 Location and condition of medical emergency kits (eye wash stations and first aid kits):

CLOSED - NOT INSPECTED

M.4 Staff knowledge of emergency procedures/numbers?

CLOSED - NOT INSPECTED

N. OTHER COMMENTS:

MW-9 - WANT TO SAMPLE

MW-7 DRY, BUT LOTS OF BRUSH OVERGROW.

O. RECOMMENDATIONS:

AGAIN, MW-9 SHOULD BE RECONSTRUCTED ON DRY LAND, NOT IN POND FOOTPRINT. REMOVE FALLEN TREES OVER MW-14/MW-11 AND MW-7.



APPENDIX K

Yard Waste Quantity Summary

Date	Material Name	Tonnes
2025-01-04	Leaf and Yard Waste (kg)	0.05
2025-01-06	Leaf and Yard Waste (kg)	0.05
2025-01-10	Leaf and Yard Waste (kg)	0.54
2025-01-13	Leaf and Yard Waste (kg)	0.25
2025-01-17	Leaf and Yard Waste (kg)	0.2
2025-01-20	Leaf and Yard Waste (kg)	0.16
2025-01-24	Leaf and Yard Waste (kg)	0.19
2025-01-25	Leaf and Yard Waste (kg)	0.04
2025-01-31	Leaf and Yard Waste (kg)	0.1
2025-02-10	Leaf and Yard Waste (kg)	0.2
2025-02-21	Leaf and Yard Waste (kg)	0.13
2025-02-22	Leaf and Yard Waste (kg)	0.06
2025-03-07	Leaf and Yard Waste (kg)	0.06
2025-03-14	Leaf and Yard Waste (kg)	0.48
2025-03-17	Leaf and Yard Waste (kg)	0.16
2025-03-21	Leaf and Yard Waste (kg)	2.13
2025-03-22	Leaf and Yard Waste (kg)	1.8
2025-03-22	Leaf and Yard Waste (n/c)	0.3
2025-03-24	Leaf and Yard Waste (kg)	0.4
2025-03-28	Leaf and Yard Waste (kg)	1.14
2025-03-29	Leaf and Yard Waste (kg)	1.09
2025-03-31	Leaf and Yard Waste (n/c)	7.94
2025-04-04	Leaf and Yard Waste (n/c)	86.43
2025-04-05	Leaf and Yard Waste (n/c)	43.64
2025-04-07	Leaf and Yard Waste (kg)	0.06
2025-04-07	Leaf and Yard Waste (n/c)	55.29
2025-04-11	Leaf and Yard Waste (kg)	1
2025-04-11	Leaf and Yard Waste (n/c)	51.05
2025-04-12	Leaf and Yard Waste (n/c)	71.26
2025-04-14	Leaf and Yard Waste (n/c)	62.05
2025-04-14	Leaf and Yard Waste (yd3)	1.5
2025-04-19	Leaf and Yard Waste (n/c)	77.43
2025-04-21	Leaf and Yard Waste (kg)	0.05
2025-04-21	Leaf and Yard Waste (n/c)	40.48
2025-04-25	Leaf and Yard Waste (kg)	0.25
2025-04-25	Leaf and Yard Waste (n/c)	55.07
2025-04-26	Leaf and Yard Waste (n/c)	40.94
2025-05-02	Leaf and Yard Waste (n/c)	30.13
2025-05-03	Leaf and Yard Waste (n/c)	29.53
2025-05-16	Leaf and Yard Waste (n/c)	13.51
2025-05-17	Leaf and Yard Waste (n/c)	8.15
2025-05-19	Leaf and Yard Waste (n/c)	7.98
2025-05-24	Leaf and Yard Waste (n/c)	11.58
2025-05-26	Leaf and Yard Waste (n/c)	9.5
2025-05-30	Leaf and Yard Waste (kg)	0.22
2025-05-30	Leaf and Yard Waste (n/c)	9.13
2025-05-31	Leaf and Yard Waste (n/c)	13.19
2025-06-02	Leaf and Yard Waste (kg)	2.43

Date	Material Name	Tonnes
2025-06-02	Leaf and Yard Waste (n/c)	0.28
2025-06-06	Leaf and Yard Waste (kg)	5.47
2025-06-06	Leaf and Yard Waste (n/c)	28.03
2025-06-07	Leaf and Yard Waste (kg)	7.22
2025-06-09	Leaf and Yard Waste (kg)	3.24
2025-06-13	Leaf and Yard Waste (kg)	9.26
2025-06-14	Leaf and Yard Waste (kg)	4.14
2025-06-16	Leaf and Yard Waste (kg)	3.68
2025-06-20	Leaf and Yard Waste (kg)	8.28
2025-06-21	Leaf and Yard Waste (kg)	4.45
2025-06-23	Leaf and Yard Waste (kg)	1.6
2025-06-27	Leaf and Yard Waste (kg)	4.33
2025-06-28	Leaf and Yard Waste (kg)	1.81
2025-06-30	Leaf and Yard Waste (kg)	2.71
2025-07-04	Leaf and Yard Waste (kg)	6.79
2025-07-05	Leaf and Yard Waste (kg)	4.06
2025-07-07	Leaf and Yard Waste (kg)	5
2025-07-11	Leaf and Yard Waste (kg)	2.74
2025-07-11	Leaf and Yard Waste (n/c)	0.08
2025-07-12	Leaf and Yard Waste (kg)	2.47
2025-07-14	Leaf and Yard Waste (kg)	2.55
2025-07-14	Leaf and Yard Waste (n/c)	0.05
2025-07-18	Leaf and Yard Waste (kg)	3.54
2025-07-19	Leaf and Yard Waste (kg)	1.96
2025-07-19	Leaf and Yard Waste (n/c)	0.1
2025-07-21	Leaf and Yard Waste (kg)	1.69
2025-07-25	Leaf and Yard Waste (kg)	4.77
2025-07-26	Leaf and Yard Waste (kg)	2.64
2025-07-28	Leaf and Yard Waste (kg)	1.84
2025-07-28	Leaf and Yard Waste (n/c)	0.44
2025-08-01	Leaf and Yard Waste (kg)	4.73
2025-08-02	Leaf and Yard Waste (kg)	1.71
2025-08-02	Leaf and Yard Waste (n/c)	0.06
2025-08-04	Leaf and Yard Waste (kg)	2.52
2025-08-08	Leaf and Yard Waste (kg)	6.48
2025-08-09	Leaf and Yard Waste (kg)	3.87
2025-08-11	Leaf and Yard Waste (kg)	2.9
2025-08-11	Leaf and Yard Waste (n/c)	0.27
2025-08-15	Leaf and Yard Waste (kg)	3.62
2025-08-15	Leaf and Yard Waste (n/c)	0
2025-08-16	Leaf and Yard Waste (kg)	1.27
2025-08-18	Leaf and Yard Waste (kg)	2.9
2025-08-22	Leaf and Yard Waste (kg)	3.73
2025-08-23	Leaf and Yard Waste (kg)	4.6
2025-08-25	Leaf and Yard Waste (kg)	7.58
2025-08-29	Leaf and Yard Waste (kg)	2.01
2025-08-30	Leaf and Yard Waste (kg)	2.9
2025-09-01	Leaf and Yard Waste (kg)	2.1

Date	Material Name	Tonnes
2025-09-05	Leaf and Yard Waste (kg)	7.52
2025-09-06	Leaf and Yard Waste (kg)	2.6
2025-09-08	Leaf and Yard Waste (kg)	2.19
2025-09-12	Leaf and Yard Waste (kg)	2.21
2025-09-13	Leaf and Yard Waste (kg)	4.74
2025-09-13	Leaf and Yard Waste (n/c)	0.28
2025-09-15	Leaf and Yard Waste (kg)	6.78
2025-09-19	Leaf and Yard Waste (kg)	2.8
2025-09-20	Leaf and Yard Waste (kg)	2.79
2025-09-22	Leaf and Yard Waste (kg)	1.77
2025-09-26	Leaf and Yard Waste (kg)	2.34
2025-09-27	Leaf and Yard Waste (kg)	1.49
2025-09-29	Leaf and Yard Waste (kg)	2.69
2025-10-03	Leaf and Yard Waste (kg)	3.32
2025-10-04	Leaf and Yard Waste (kg)	3.56
2025-10-04	Leaf and Yard Waste (n/c)	0.14
2025-10-06	Leaf and Yard Waste (kg)	3.44
2025-10-10	Leaf and Yard Waste (kg)	2.655
2025-10-11	Leaf and Yard Waste (kg)	2.24
2025-10-11	Leaf and Yard Waste (n/c)	0.025
2025-10-13	Leaf and Yard Waste (kg)	2.645
2025-10-13	Leaf and Yard Waste (n/c)	0.065
2025-10-17	Leaf and Yard Waste (kg)	4.395
2025-10-17	Leaf and Yard Waste (n/c)	0.21
2025-10-18	Leaf and Yard Waste (kg)	3.78
2025-10-20	Leaf and Yard Waste (kg)	4.93
2025-10-24	Leaf and Yard Waste (kg)	4.28
2025-10-25	Leaf and Yard Waste (kg)	12.21
2025-10-27	Leaf and Yard Waste (kg)	3.91
2025-10-31	Leaf and Yard Waste (kg)	2.125
2025-11-01	Leaf and Yard Waste (kg)	3.81
2025-11-03	Leaf and Yard Waste (kg)	5.115
2025-11-07	Leaf and Yard Waste (kg)	5.215
2025-11-08	Leaf and Yard Waste (kg)	4.935
2025-11-08	Leaf and Yard Waste (n/c)	0.73
2025-11-10	Leaf and Yard Waste (kg)	1.605
2025-11-14	Leaf and Yard Waste (kg)	5.095
2025-11-15	Leaf and Yard Waste (kg)	1.14
2025-11-17	Leaf and Yard Waste (kg)	1.26
2025-11-21	Leaf and Yard Waste (kg)	5.405
2025-11-22	Leaf and Yard Waste (kg)	1.94
2025-11-24	Leaf and Yard Waste (kg)	2.565
2025-11-28	Leaf and Yard Waste (kg)	7.205
2025-11-29	Leaf and Yard Waste (kg)	1.335
2025-12-01	Leaf and Yard Waste (kg)	0.315
2025-12-01	Leaf and Yard Waste (n/c)	0.095
2025-12-06	Leaf and Yard Waste (kg)	0.125
2025-12-08	Leaf and Yard Waste (kg)	0.67

Date	Material Name	Tonnes
2025-12-22	Leaf and Yard Waste (kg)	0.345
		86.43



APPENDIX K

MECP Landfill Reporting Submission Forms

Appendix D-Monitoring and Screening Checklist

General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.

Instructions: A complete checklist consists of:

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

Definition of Groundwater CEP:

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

- (a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
- (b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

Definition of Surface water CEP:

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

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

Monitoring Report and Site Information	
Waste Disposal Site Name	Somerville Landfill Site
Location (e.g. street address, lot, concession)	381 Ledge Hill Road within the City of Kawartha Lakes
GPS Location (taken within the property boundary at front gate/ front entry)	683628 / 4945666
Municipality	City of Kawartha Lakes
Client and/or Site Owner	City of Kawartha Lakes
Monitoring Period (Year)	2025
This Monitoring Report is being submitted under the following:	
Certificate of Approval No.:	A321604
Director's Order No.:	Type Here
Provincial Officer's Order No.:	Type Here
Other:	Type Here

Report Submission Frequency	☒ Annual ☐ Other	Specify (Type Here):
The site is:	☒ Active ☐ Inactive ☐ Closed	
If closed, specify C of A, control or authorizing document closure date:		
Has the nature of the operations at the site changed during this monitoring period?	☐ Yes ☒ No	
If yes, provide details:	Type Here	
Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i. e. exceeded the LEL for methane)	☒ Yes ☐ No	

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:	☐ Yes ☒ No	MW9 damaged and needs repair
2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document(s):	☐ Yes ☒ No ☐ Not Applicable	If no, list exceptions below or attach information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
Type Here	deviations from program outlined in report	Select 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 WDS gas sampling and monitoring requirements have been established or defined outside of a ministry C of A, authorizing, or control document.		☐ Yes ☒ No ☐ Not Applicable	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:		☐ Yes ☐ No ☒ Not Applicable	If no, list exceptions below or attach additional information.
Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
4) All field work for groundwater investigations was done in accordance with standard operating procedures as established/outlined per the Technical Guidance Document (including internal/external QA/ QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	☒ Yes ☐ No	If no, specify (Type Here):	

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.	☒ Yes ☐ No		
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	If no, list exceptions and explain reason for increase/change (Type Here):	
1) Is one or more of the following risk reduction practices in place at the site: (a) There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/treatment; or (b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or (c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation): <i>i.</i> The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and <i>ii.</i> Seasonal and annual water levels and water quality fluctuations are well understood.	☒ Yes ☐ No	Note which practice(s):	☐ (a) ☒ (b) ☒ (c)
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	☐ Yes ☒ No ☐ Not Applicable		

Groundwater CEP Declaration:

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

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

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

11-Mar-2026

Recommendations:

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

☐ No changes to the monitoring program are recommended

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

gas monitoring to be removed from program

☒ No Changes to site design and operation are recommended

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

Type Here

Name:	Colin Ross, B.Sc., P.Geo.		
Seal:	Add Image 		
Signature:		Date:	11-May-2026
CEP Contact Information:	Colin Ross		
Company:	Azimuth Environmental Consulting Inc.		
Address:	642 Welham Road, Barrie, ON L4N 9A1		
Telephone No.:	705-721-8451	Fax No. :	705-721-8926
E-mail Address:	colin@azimuthenvironmental.com		
Co-signers for additional expertise provided:			
Signature:		Date:	Select Date
Signature:		Date:	Select Date

Surface Water WDS Verification:		
Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):		
Name (s)	Burnt River	
Distance(s)	1.5km	
Based on all available information and site knowledge, it is my opinion that:		
Sampling and Monitoring Program Status:		
1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	☒ Yes ☐ No	If no, identify issues (Type Here):
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):	☒ Yes ☐ No ☐ Not applicable (No C of A, authorizing / control document applies)	If no, specify below or provide details in an attachment.
Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
Type Here	Type Here	Select 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 C of A or authorizing/control document.		☐ Yes ☒ No ☐ Not Applicable	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:		☐ Yes ☐ No ☐ Not Applicable	If no, specify below or provide details in an attachment.
Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
4) All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/ outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):		☒ Yes ☐ No	If no, specify (Type Here):

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

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

☒ Yes
☐ No

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

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

7) All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.	☒ Yes ☐ No	
8) For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g., PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):	☒ Yes ☐ No ☐ Not Known ☐ Not Applicable	If yes, provide details and whether remedial measures are necessary (Type Here) There is no trending that would suggest further actions are required.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	☐ Yes ☒ No ☐ Not Applicable	If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here)

Surface Water CEP Declaration:

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

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

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

11-May-2026

Recommendations:

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

☒ No Changes to the monitoring program are recommended ☐ The following change(s) to the monitoring program is/are recommended:	
☒ No changes to the site design and operation are recommended ☐ The following change(s) to the site design and operation is/are recommended:	Type Here

CEP Signature		
Relevant Discipline	Hydrogeology	
Date:	11-Mar-2026	
CEP Contact Information:	Colin Ross	
Company:	Azimuth Environmental Consulting Inc.	
Address:	642 Welham Road, Barrie, ON L4N 9A1	
Telephone No.:	705-721-8451 x 205	
Fax No. :	705-721-8926	
E-mail Address:	colin@azimuthenvironmental.com	
Save As		Print Form