2024 Annual Report, Crystal Lake Transfer Station

Environmental Compliance Approval No. A341202

April 8, 2025

Prepared for:
The Municipality of Trent Lakes

Cambium Reference: 10520-003

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Executive Summary

The Crystal Lake transfer station operates under the Ministry of the Environment, Conservation and Parks amended Environmental Compliance Approval No. A341202. The site is at 665 Crystal Lake Road, 8.5 km southeast of the Village of Kinmount. The total site area is 12.13 ha and has an approved landfill area of 1.2 ha. The site ceased landfilling in 2002 and now operates as a waste transfer station.

This report presents the results of the 2024 activities that were completed at the Crystal Lake transfer station. The report and activities have been completed and reported on in general conformance with the November 2010 Ministry of the Environment Technical Guidance Document entitled *Monitoring and Reporting for Waste Disposal Sites – Groundwater and Surface Water*. The Monitoring and Screening Checklist is provided in Appendix A.

Groundwater elevations indicated that groundwater flow is primarily controlled by bedrock topography and flows toward the northwest. Based on the conceptual site model, impacted groundwater is expected to primarily discharge immediately to surface at the toe of the waste mound and eventually flow into a tributary of Union Creek. Impacts to the south of the waste mound were not expected to extend past the southwest property boundary.

Elevated concentrations were occurring at surface water stations SW3 and SW2 due to the ponded stagnant nature of the surface water, as well as impacts from the adjacent site access road and Crystal Lake Road; however, given the proximity to the waste mound, site impacts were possible. All remaining surface water locations were either not impacted or exhibited elevated parameter concentrations attributed to road salt impacts and/or natural sources. No impacts were present at the down-gradient/downstream tributary of Union Creek or the Burnt River.

The Crystal Lake waste disposal site and transfer station were operated in compliance with the Environmental Compliance Approval in 2024. The property area of 12.13 ha owned by the Municipality of Trent Lakes was considered sufficient for operational buffer and contaminant attenuation zone purposes in 2024 for the Crystal Lake transfer station.

Recommendations were made regarding the future operation of the Crystal Lake transfer station and work to be completed at the site in 2025.

Respectfully submitted,

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Table of Contents

List of Embedded Tables

List of Appended Figures

List of Appended Tables

List of Appendices

(Appended Items Available in Part II)

1.0 Introduction

Cambium Inc. (Cambium) was retained by the Corporation of the Municipality of Trent Lakes (Municipality) to complete the 2024 monitoring program for the Crystal Lake transfer station (Site). The Site operates in accordance with the Ministry of the Environment, Conservation and Parks (Ministry) amended Environmental Compliance Approval (ECA) No. A341202, issued on February 13, 2022 (Appendix B).

To aid in the understanding of the site history and development, the following information is included digitally in the report package:

- Memorandum, RE: Crystal Lake Landfill Site Closure Plan (TSH, 2006)
- Site Inspection (WSP, 2016)
- ECA Application and supporting documents, submitted May 16, 2016
- *Transfer Station Standard Operating Procedures* (MTL, 2020a)
- *Transfer Station Safety, Emergency and Spills Procedures* (MTL, 2020b)
- Historical water quality (2005 to 2010) (WSP, 2017)
- Environment Compliance Approval Application and supporting documentation to amend ECA dated November 19, 2020
- Historical correspondence

1.1 Site Location

The Site is on part of Lots 10 and 11, Concession 11, geographic Galway Township, Municipality of Trent Lakes, County of Peterborough (Figure 1). The Site is at 665 Crystal Lake Road, on the north side of the road, 8.5 km southeast of the Village of Kinmount. The Universal Transverse Mercator (UTM) coordinates for the Site entrance are Zone 17, 4956615 m north, 693047 m east.

1.2 Site Description

The Site operated as a natural attenuation 1.2 ha landfill within a 12.53 ha site for the disposal of domestic, commercial, and non-hazardous solid industrial waste from 1980 until it ceased accepting waste in 2002. The Site is an approved Transfer Station for the receipt, temporary storage, and transfer of solid, non-hazardous municipal waste, municipal hazardous and special wastes (MHSW), waste electrical and electronic equipment (WEEE), and organic waste. Site details are found in Embedded Table 1. A Local Topography Plan, Sample Location Plan, and an Existing Conditions Plan are attached as Figure 2, Figure 3, and Figure 4, respectively.

Embedded Table 1 Site Details

Total Site Area	12.73 ha
Total Licensed Waste Disposal Site Area	12.53 ha
Approved Area of Refuse Placement	1.2 ha

1.3 Scope of Work

The scope of the 2024 work program was based on the results of the 2023 monitoring program (Cambium, 2024), the requirements of the ECA, and included:

- Groundwater elevation monitoring
- Surface water and groundwater sampling and analysis
- Evaluation of groundwater quality against the Ontario Drinking Water Quality Standards (ODWQS) and Reasonable Use Concept (RUC) values developed in accordance with Ministry Guideline B-7
- Evaluation of surface water against the Provincial Water Quality Objectives (PWQO)
- An overview of site development and operations
- Preparation of this report

This report presents the results of the 2024 work program, provides an assessment of the current landfill impact of the Site on the surrounding groundwater and surface water environments, and a summary of the operational activities at the Site. Cambium has provided recommendations for the 2025 monitoring program and site operations based on the 2024 results and assessment.

2.0 Methodology

The 2024 work program was completed to maintain compliance with the Site ECA and Ministry guidelines and regulations. As such, the monitoring program was completed consistent with the *Guidance Manual for Landfill Sites Receiving Municipal Waste* (MOEE, 1993)*, Landfill Standards* (MECP, 2021), and *Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water, Technical Guidance Document* (MOE, 2010).

Field tasks were completed following Cambium's Standard Operating Procedures developed from recognized standard procedures such as those listed above and *Guidance on Sampling and Analytical Methods for use at Contaminated Sites in Ontario* (MOEE, 1996). A health and safety program was developed for site-specific conditions and all Cambium personnel working on the project were familiarized and required to follow the identified protocol.

Groundwater and surface water samples were stored in coolers with freezer packs and maintained at less than 10°C during transport to SGS Canada Inc. (SGS) in Lakefield, Ontario. SGS is accredited by the Canadian Associations for Laboratory Accreditation Inc. for specific environmental tests listed in the scope of accreditation. Groundwater and surface water samples were submitted at the frequency and for analysis of the parameters outlined in Table 1.

2.1 Groundwater Monitoring Program

The following tasks were completed as part of the 2024 groundwater monitoring program:

- Prior to sampling, water levels were measured at each monitoring well using an electronic water level tape.
- The purge volume was calculated on-site during each monitoring even using the measured water level, well depth, and the borehole diameter. Each groundwater monitoring well to be sampled was purged of approximately three well bore volumes. For wells with low recovery, at least one saturated borehole volume was purged prior to sampling. Purged water was disposed on-site, down-gradient of each respective well.

- Samples were collected using dedicated polyethylene tubing equipped with inertial-lift foot valves.
- Groundwater samples for metals and dissolved organic carbon (DOC) analysis were field filtered.
- Field measurements were recorded for pH, conductivity, temperature, dissolved oxygen (DO), and oxygen reduction potential (ORP).

Groundwater samples were collected on May 28 and November 13 from the monitoring wells listed below, except for:

- DP4 had a limited sample in May and insufficient volumes for sample collection in November
- BH16-1D had a limited sample in May and a sample could not be collected in November as the well did not recover following development.

Monitoring wells included in the program are shown on Figure 3, Figure 4, and Figure 5. The UTM coordinates for the monitoring locations are in Table 2. Groundwater results are discussed in Section 4.2. Field data sheets are in Appendix C. Laboratory Certificates of Analysis provided by SGS are in Appendix D. Photographs of the monitoring wells are in Appendix E.

- MW1-U
- MW1-L
- DP1
- DP2
- DP3
- DP4
- BH16-1S
- BH16-1D
- BH16-2

2.2 Surface Water Monitoring Program

The following tasks were completed as part of the 2024 surface water monitoring program:

- Weather conditions prior to and during field events were recorded.

- Surface water samples were collected by immersing the sample container into the water body.
- When sample bottles were prefilled with preservatives, a clean bottle was used to collect and decant the water directly into the sample bottle.
- Surface water samples for mercury (0.45 µm) and aluminum (0.20 µm) analysis were filtered by the laboratory.
- Field measurements were recorded for pH, conductivity, temperature, DO, and ORP.
- Where possible, depth, width, and flow velocity measurements were collected at each surface water location.

The surface water monitoring program included collection of samples from surface water sample stations SW2, SW3, SW4, SW5, and SW6 on May 28, September 5, and November 13, with the following exceptions:

- SW3 had insufficient volumes for collection in September and was dry in November
- SW2 was frozen in November

Surface water monitoring locations are on Figure 3. The UTM coordinates for the monitoring locations are in Embedded Table 2. Surface water results are discussed in Section 4.3. Field data sheets are in Appendix C. Laboratory Certificates of Analysis provided by SGS are in Appendix D. Photographs of sampling stations are in Appendix E.

2.3 Quality Assurance / Quality Control Program

Quality Assurance/Quality Control (QA/QC) measures are in place to ensure the integrity of sample collection and analysis. Cambium collects blind field duplicate samples for groundwater and surface water as part of the QA/QC program. A minimum of 10% of the total samples are collected. In addition to these samples, the laboratory completes internal QA/QC. The duplicate samples are collected at the same time and location as the original samples. Duplicate samples are collected by filling the bottles for the same analysis at the sample time to ensure samples are consistent. Other key parts of Cambium's QA/QC program may include:

- Calibration of field equipment at the start of each day. Equipment is checked throughout the day, as necessary.
- Laboratory grade detergent and distilled water are used for decontamination of non-disposable equipment. Care is taken to avoid cross contamination.
- Surface water sampling is conducted from the farthest station downstream/down-gradient of the Site, followed by advancing up-gradient/upstream or toward the Site.
- Use of new nitrile gloves at each sample location.
- Use of dedicated tubing and inertial foot-valves at each groundwater wells to prevent potential cross-contamination and reduce waste.
- Where wells are sediment laden or have limited water volumes, a peristatic pump is used to purge well and complete sampling.

Blind duplicate groundwater and surface water samples were collected from the following locations as part of the QA/QC program. The results of the QA/QC program are presented in Section 4.1.

- BH16-2 in May and November
- SW2 in May
- SW5 in September and November

2.4 Landfill Gas Monitoring Program

Landfill gas is not actively managed at the Site. The large, open site area and isolated location from the public supports passive landfill gas management, which allows generated landfill gas to naturally disperse through the waste and naturally-permeable cover to the atmosphere.

The purpose of the monitoring landfill gas was to assess compliance with Section 4.10 of *Landfill Standards, A Guideline on the Regulatory and Approval Requirements for New and Expanding Landfilling Sites* (MOEE, 1998).

An RKI Eagle II calibrated for methane was used to collect landfill gas measurements. Equipment is calibrated for methane daily by Cambium field staff prior to heading out to site. Calibration standards were brought to Site in the event the instrument needed to be recalibrated (e.g., due to elevated readings, equipment malfunction, etc.).

Landfill gas measurements were collected prior to measuring groundwater levels or collecting samples. Methane concentrations were measured at each location. The following methodology was used to collect landfill gas measurements:

- Upon arrival to site, the RKI Eagle II was turned on and ran for five minutes prior to any measurements to allow the equipment to acclimatize.
- Weather conditions for the monitoring event and previous day were recorded including barometric pressure.
- Prior to each reading, the ambient air methane concentration was recorded.
- The well cap was removed and the gas probe was inserted into the top headspace of the well. A hand was used to cap the top of the well to reduce the amount of gas lost to the atmosphere.
- The peak methane concentration was recorded.
- Water levels measurements were taken at all monitoring locations.

Landfill gas monitoring was conducted in conjunction with the groundwater sampling event on November 13 at all monitoring wells. The spring landfill gas monitoring was completed on May 30 due to equipment issues. The following exceptions were:

- During the May 28 sampling event, the RKI Eagle II was not available and readings were not recorded. The spring landfill gas monitoring was completed on May 30, 2024, instead.
- Landfill gas monitoring at DP3 was not completed in May due to the cap being stuck and unremovable for reading.

Sample locations are shown on Figure 3. Landfill monitoring results are discussed in Section 2.4. Field data sheets are in Appendix C.

2.5 Site Inspection and Operation Overview

Site operations were observed during the visits conducted by Cambium staff in May, September, and November 2024. During site visits, the following items were inspected on accessed areas of the Site and observations noted in the field file. In early 2025, the Municipality provided additional Site maintenance information from 2024. The results of the Site inspections conducted are presented in Section 5.0.

- Litter control
- Condition and layout of access roads, access gates
- Condition and layout of recycling bins
- Status of monitoring well security
- Condition of final cover
- Presence of leachate seeps

3.0 Geological and Hydrogeological Context

3.1 Topography and Drainage

The Site is on a topographic upland which is comprised of rolling hummocky Precambrian metasedimentary bedrock, veneered by glaciofluvial fine-medium grained sand deposits that are generally less than 0.6 m thick. Immediately adjacent to the north flank of the bedrock upland, there is an unnamed tributary of Union Creek. Based on topographic mapping, the Site is about 30 m in elevation above the surface water network (WSP, 2017).

The Site is in the Lake Ontario and Niagara Peninsula secondary watershed and the Gull River tertiary watershed (Figure 2). The flow in the area generally collects from the northeast areas of Peterborough County and drains southwest through Trent Lakes and into Cameron Lake. Locally, drainage from the Site collects in low-lying wet areas migrating southwest via natural depressions and channels, where it flows into Union Creek and discharges to the Burnt River, which is 7.8 km west of the Site.

A prominent depression trends toward the west near the southern property boundary of the Site and drains through a culvert passing beneath Crystal Lake Road, about 50 m west of the access road to the Site. This depression is discontinuous and likely only transports surface water run-off during the spring snowmelt period. Another depression drains through a densely wooded area from the west-central areas of the Site. Surface water surrounding the Site is characterized as a ponded (unevaluated) wetland environment.

There are currently five surface water stations on and around the Site, as described below and shown on Figure 3.

- SW2 is on the east side of the Site access road, 40 m north of Crystal Lake Road.
- SW3 is adjacent to the western Site entrance on the north side of Crystal Lake Road, 70 m south of the waste mound.

- SW4 is sampled from a culvert and is on the west side of Allen's Alley, 320 m north of the waste mound. This station samples a tributary which drains into another stream that flows southwest towards Crystal Lake Road.
- SW5 is sampled from a culvert and is on the north side of Crystal Lake Road, 560 m southwest of the waste mound. This station samples water from the tributary which flows southwest from surface water station SW4.
- SW6 is a historical seep and is 40 m northwest of the waste mound at the edge of a low-lying wetland area.

The geospatial coordinates (NAD 83) for the surface water monitoring stations are in Embedded Table 2. Flow and discharge rates measured during the monitoring events are in Appendix C. There was no staining observed at any of the surface water monitoring stations that would be indicative of leachate impacted groundwater discharging to surface. Photographs of surface water monitoring stations are provided in Appendix E.

Embedded Table 2 Coordinates of Surface Water Stations

Surface Water Station	UTM (Zone 17)
SW2	693091 m east, 4956649 m north
SW3	693044 m east, 4956584 m north
SW4	693034 m east, 4957090 m north
SW5	692488 m east, 4956386 m north
SW6	692465 m east, 4956779 m north

3.1.1 Precipitation Data

A review of the 2024 precipitation data for the Beatrice Climate weather station (Government of Canada, 2024a) in comparison to the average precipitation data for 1991 to 2020 for the Haliburton 3 weather station (Government of Canada, 2024b) indicated the total annual precipitation was less than normal; however, individual months varied. April, June, November, and December received between 47% to 130% more precipitation than normal. October received 54% less precipitation than normal. The monthly precipitation, as well as the amount

of precipitation during and in the three days prior to the sampling events is summarized in Embedded Table 3. Refer to Appendix C for field sheets and climate data.

Embedded Table 3 Historical and 2024 Precipitation Data

Sampling Date	Average Monthly Precipitation (mm) (1991 – 2020)	2024 Precipitation (mm)	Precipitation During and Prior to Sampling (mm)
May 28	91.7	66.6	29.3
September 5	98.9	70.0	2.2
November 13	103.2	151.5	21.5

3.2 Hydrogeology

The waste mound is on a topographic divide which is controlled by bedrock topography. This divide causes groundwater to flow north toward the adjacent wetland and south toward local bedrock depressions that outlet farther downstream of the wetland from the Site. Based on the wetland area to the north of the Site, groundwater flow discharges immediately to surface (WSP, 2017).

The current monitoring program consists of the following nine monitoring wells.

- MW1 is a multi-level monitor in the waste mound and is completed in the bedrock unit (granite). This monitor is screened from 6.7 to 9.8 m below ground surface (bgs) (MW1-U) and from 18.3 to 21.3 mbgs (MW1-L).
- BH16-1D is completed in the bedrock unit (pink granite) and is screened between 6.3 and 10.1 mbgs.
- BH16-1S is completed in the bedrock unit (pink granite) unit and is screened between 3.8 and 5.5 mbgs.
- BH16-2 is completed in the overburden unit (silt, trace gravel) and is screened between 5.5 and 8.5 mbgs.
- DP1, DP2, DP3, and DP4 are shallow-drive point piezometers completed to 1.76, 1.42, 0.98, and 1.21 mbgs, respectively.

BH16-1 and BH16-2 were installed in 2016, sampled for the first time in October 2016, and surveyed in early 2018. BH16-2 was proposed to be in the southwest property boundary, as documented in the *2016 Annual Report* (WSP, 2017); however, upon surveying this well in 2018, it became apparent the well is actually 100 m west of the property boundary (Figure 3).

No well records were available for DP1 to DP4. Given their construction depth and their surroundings, it is assumed that the piezometers are installed in the shallow overburden. Available borehole logs can be found in Appendix F.

3.2.1 Water Well Records

A Ministry water well search was completed and no water well records were identified within 500 m of the waste mound other than the records for wells MW1, BH16-1, and BH16-2 (Figure 2) (MECP, 2024). Well records available in the vicinity of the Site (beyond 500 m) indicated that the domestic water supply aquifer was in the deep granite bedrock, usually reported between 60 and 130 mbgs. It is not anticipated that impacts from the Site will adversely impact the surrounding water supply aquifer.

3.2.2 Groundwater Flow Direction

Groundwater elevations collected in 2024 were used to define the horizontal groundwater flow direction at the Site. Elevations in 2024 were primarily within historical ranges except for BH16-1D which was below range in November. MW1-U and MW1-L have been decreasing in elevation since 2012. This indicated mounding beneath the waste mound has continued to recede post-closure. A summary of the groundwater elevation data is in Table 2 and on Figure 6.

Water elevations indicated that groundwater predominantly flowed to the northwest (Figure 5). The horizontal hydraulic gradients calculated in 2024 are summarized in Embedded Table 4.

Embedded Table 4 Summary of Horizontal Hydraulic Gradients

Location	Spring	Autumn
North of the Waste Mound	0.091 m/m northwest	0.084 m/m northwest
West of the Waste Mound	0.099 m/m northwest	0.098 m/m northwest

3.3 Vertical Gradients

Vertical gradients were calculated at clustered monitors BH16-1S/1D and nested monitors MW1-U/L (Table 3). Consistent with historical results, vertical gradients were calculated to be downward, which indicated that groundwater gradually infiltrates through the shallow fractured metasedimentary rocks to the deeper bedrock.

3.4 Conceptual Site Model

Groundwater flow is primarily controlled by bedrock topography and flows to the northwest of the waste mound with a minor component of flow in the waste mound area to the west-southwest toward monitor DP1. Groundwater flow in the vicinity of the waste mound and Site is largely captured within the organic-rich depressions (discharges to surface). Surface water on and adjacent the Site either enters the tributary to Union Creek and flows southwest toward the Burnt River (north of the waste mound and Site) or infiltrates back into the ground (south of the Site and Crystal Lake Road). Where groundwater does not discharge to surface, this water gradually migrates northwest, infiltrating downward through to the shallow fractured metasedimentary rocks, as evidenced by the downward vertical gradients at nested monitors MW1-U/L and clustered monitors BH16-1S/1D.

4.0 Results and Discussion

Water quality analytical results from the monitoring program are used to assess the existence, extent, and level of impacts to the surface water and groundwater environments related to landfilling activities. Water quality data are compared against background water quality and historical data for the Site to permit an analysis of any significant changes or trends in the water quality over time.

This section presents the results of the 2024 monitoring program at the Site.

4.1 Quality Assurance/Quality Control

Results from the analyses completed on the blind duplicate QA/QC samples were evaluated. Parameter concentrations were considered significantly different if the relative percent difference (RPD) between the duplicate and the parent samples was greater than 30% when both results were greater than five times the reported detection limit (RDL).

The duplicate groundwater and surface water analyses were compared to the originals. Overall, the duplicate samples correlated well with the parent samples and met the data quality objective of 30% with the following exceptions:

- Turbidity at SW2 in May
- Iron at BH16-2 in May and November
- Total phosphorus and total suspended solids (TSS) at SW5 in November

Parent/duplicate samples with only one measurable concentration or with results reporting less than five times the RDL were assessed qualitatively. Evaluation of these parent/duplicate samples did not identify significant data quality issues.

Considering the low variation between the parent and duplicate groundwater and surface water samples, the results were interpreted with confidence.

4.2 Groundwater Quality

The groundwater chemistry data obtained from the analysis of water samples collected from the monitoring wells at the Site from 2006 to 2011 (WSP, 2017) are included digitally with this report package. Water quality data from 2012 to 2024 are summarized in Table 4 and Table 5.

To assess water quality impacts related to landfill site operations, the analytical results for groundwater samples collected on-site were compared to background water quality and historical data. Compliance was assessed using the Ministry RUC (MOEE, 1994a).

4.2.1 Background Quality

When evaluating the impact of any waste disposal site on a groundwater resource, a reference point or value must be established to assist in determining the magnitude of the impact. The quality of the groundwater that is non-impacted by the waste disposal site/transfer station operation (i.e., background water quality) should be used for comparison purposes.

Monitors BH16-1S and BH16-1D were installed in 2016 to characterize background groundwater quality and were sampled for the first time in the autumn of 2016. Road salt impacts have been evident given the elevated total dissolved solids (TDS), chloride, sodium, hardness, calcium, and magnesium, particularly at BH16-1D. DOC has also been elevated at both locations.

Given results to date, these wells are suitable background wells; however, salt related parameters should be interpreted with caution in down-gradient wells, given the obvious road salt impacts at these locations.

4.2.2 Leachate Characteristics

Multi-level monitor MW1 is installed in the waste mound and is used to characterize leachate quality at the Site. Historically, this monitor has exhibited high concentrations of most parameters, but most notably for the following:

- MW1-U: ammonia, alkalinity, barium, calcium, conductivity, chloride, chloroethane, DOC, hardness, iron, magnesium, manganese, and TDS

- MW1-L: barium, conductivity, chloride, nitrate, sodium, and TDS

Despite several of these parameters being elevated at the background monitor(s) due to road salt impacts (e.g., TDS, chloride, sodium, DOC, manganese, etc.), there were clearly leachate related impacts compounding the concentrations, particularly at MW1-U. Although boron, potassium, and sulphate were elevated at BH16-1D, given the low concentrations at BH16-1S, it is possible the elevated boron concentrations at MW1-U and MW1-L, elevated potassium concentrations at MW1-U, and elevated sulphate concentrations at MW1-L were site related.

The greatest parameter concentrations have been identified in the shallow bedrock unit, which supports the conceptual site model that indicates groundwater flow is restricted to the overburden/shallow bedrock unit. Embedded Table 5 outlines the leachate indicator parameters (LIPs) associated with the Site to date.

Embedded Table 5 Leachate Indicator Parameters

ammonia	alkalinity	barium	conductivity
TDS	chloride	chloroethane	hardness
calcium	iron	magnesium	manganese

LIP concentrations in 2024 were generally within historical ranges at MW1-L and MW1-U during the sampling events except for manganese at MW1-U in November. Refer to Figure 7 through Figure 24 for LIP time concentration graphs.

4.2.3 Down-gradient Groundwater Quality

Down-gradient groundwater quality is characterized by shallow-drive point monitors DP3 and DP4, directly north of the waste mound. Historically, these monitors have exhibited low concentrations of most parameters and have had water quality similar to the background monitors (BH16-1S and BH16-1D) with the exception of elevated manganese and iron. Given the location of these monitors in the low-lying wetland area to the north of the waste mound, the elevated iron and manganese concentrations were not unexpected and were not considered to be site related.

LIP concentrations in 2024 were within historical ranges at DP3 and DP4 except for iron at DP3 in November. Given that no impacts were identified at these monitors, this supported the conceptual site model that groundwater discharges to surface immediately northwest of the waste mound to the low-lying area.

Monitors DP1 and DP2 characterize down-gradient groundwater quality south of the waste mound. Elevated concentrations at DP2 have been attributed to the wetland environment and/or impacts from road salting activities. Leachate impacts have been present at DP1, with most LIP concentrations being greater than background and less than the leachate concentrations. Although some leachate impacts have been at this well, some elevated concentrations were also attributed to the wetland environment and road salt activities. Regardless, as some leachate impacts were likely present, this supports the southwestern component of groundwater flow.

At DP1, LIPs calcium, chloride, hardness, magnesium, and manganese, TDS, and conductivity concentrations were greater than historical ranges in May; however, all returned to within historical range during the November sampling event. Chloride has been increasing since November 2021 and was greater than historical ranges in May 2024; however, returned to within historical range in November 2024. All LIPs at DP2 were within historical ranges in 2024 except for manganese in May.

Monitor BH16-2 was installed in 2016 to assess groundwater quality at the southwestern property boundary. Historically, this monitor has exhibited similar water quality to the background monitors (BH16-1S and BH16-1D), except for elevated concentrations of ammonia, barium, chloride (marginal), nitrate, COD, TSS, and total Kjeldahl nitrogen (TKN); in general, this continued in 2024. The concentrations of barium, ammonia, COD, and TKN that have been historically greater at BH16-2 than in the leachate monitors (MW1) and were not attributed to landfill. LIP concentrations were within historical ranges in 2024.

4.2.4 Groundwater Volatile Organic Compound Monitoring

Volatile organic compound (VOC) analysis was completed during the 2024 spring sampling event at leachate monitors MW1-U and MW1-L. All VOC parameter concentrations were less than the RDLs. Refer to Table 5 for a summary of VOC results from 2009 to 2024.

4.2.5 Groundwater Compliance Assessment

The Ministry RUC (Guideline B-7) applies to operating waste disposal sites and sites closed post 1986 (MOEE, 1994a). As the Site closed in 2002, the RUC applies to the Site.

Based on the existing hydrogeological model of the Site, shallow leachate impacted groundwater discharges to the surface water systems down-gradient of the Site, particularly to the north. As dictated by the Ministry RUC (MOEE, 1994a), where groundwater provides baseflow to a surface water feature, this is the recognized reasonable use of the groundwater; therefore, management approaches should be focused on the receiving surface water feature. As such, compliance with Ministry policies for the protection of the environment should be focused to the surface water systems; refer to Section 4.3.

There is a potential for impacted groundwater to flow southwest from the waste mound and leave the Site prior to discharging to surface. As such, to ensure appropriate actions are in place to respond to any potential degradation in groundwater quality beyond an acceptable level, site-specific trigger levels have been developed for the Site. These are the RUC values developed in accordance with Ministry Guideline B-7 (MOEE, 1994a). The Ministry Guideline B-7 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 (Ministry Procedure B-7-1):

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

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

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

Where,
C_m is maximum concentration accepted
C_b is background concentration
C_r is maximum concentration permitted in accordance with the ODWQS
x is a constant that reduces the contamination to a level that is considered by the Ministry to have a negligible effect on water use (i.e., 0.5 for non-health related parameters and 0.25 for health-related parameters

The RUC values were calculated using the median value of the background concentration (C_b) from a minimum of the previous five sampling events as required by Ministry Eastern Region Technical Support Section. Where background concentrations were less than the laboratory RDL, the RDL was used as the background concentration. Where the background concentrations exceeded ODWQS, the C_b value was set as the RUC value. The calculated C_m values for the Site were set as the RUC values.

The RUC values were calculated for all the LIPs identified in Embedded Table 5 with a corresponding ODWQS criteria. The RUC assessment included the following down-gradient monitors: DP1, DP2, and BH16-2. The analytical results of the water quality data in 2024 indicated that the RUC concentrations were met in these monitoring wells except for the parameters in Embedded Table 6. It is noted that monitors BH16-1S/D were included in this table for reference purposes.

Embedded Table 6 Summary of RUC Exceedances

Monitor	RUC Criteria Exceedance
BH16-1D (Background)	None
BH16-1S (Background)	None
DP1	Alkalinity (Nov), hardness, **TDS, chloride, iron, manganese**
DP2	Alkalinity (Nov), **TDS, iron, manganese**
DP3	**Iron**, **manganese**
BH16-2	**Manganese**, iron (May)

Notes:
Bold parameters persistently exceed the RUC criteria.

As discussed in Section 4.2.3, some leachate impacts were evident at monitor DP1; therefore, the RUC exceedances at this monitor were not unexpected. Regardless, the impacts at this location were not expected to extend much beyond the southern property boundary, if at all, due to the following:

- The Site has been closed to landfilling since 2002.
- Groundwater flow is expected to travel northwest from this location.
- The farthest down-gradient monitor (to the west) is not impacted (BH16-2).

Impacts at monitor DP2 have been the result of influences from the surrounding wetland environment and/or road salting activities; this was evidenced by elevated iron, manganese, and TDS, and low concentrations of all other LIPs.

The iron manganese concentrations at BH16-2 were within historical concentration range of the background monitors BH16-1S and BH16-1D. The water quality at this location indicated that impacts from the Site did not extend beyond the western property boundary at this time.

Based on the above, the Site was interpreted to comply with the RUC (MOEE, 1994a) following the groundwater assessment in 2024.

4.3 Surface Water Quality

The 2005 to 2011 surface water quality data are included digitally as part of the report package (WSP, 2017). Water quality results from 2012 to 2024 are presented in Table 6. The surface

water data have been compared to historical results and background water quality, and compliance was assessed using the PWQO (MOEE, 1994b). Refer to Figure 7 through Figure 24 for time concentration graphs for select parameters.

4.3.1 Background Surface Water Quality

SW4 is 320 m north and upstream of any potential discharge from the waste mound and is representative of background surface water quality for the Site. SW4 has had low to moderate concentrations of most parameters with slightly elevated conductivity and concentrations of alkalinity, TDS, hardness, and barium. Parameter concentrations fluctuate seasonally, with many elevated concentrations in the summer months. Concentrations of iron, total phosphorus, zinc, and phenols have infrequently not met the PWQO criteria.

Parameter concentrations in 2024 were stable and within historical ranges. This location continued to represent background surface water quality in 2024. All parameters except for phenols (Nov) met the PWQO criteria at SW4 in 2024.

4.3.2 Downstream Surface Water Quality

SW6 monitors surface water quality at the edge of the northern wetland area between monitors DP3 and DP4. Historically, SW6 has had water quality similar to background conditions. Where concentrations have varied (e.g., elevated alkalinity, chloride, conductivity, etc. and lower barium, colour, etc.), these were attributed to varying surface water environs (ponded versus flowing). Seasonal trends at this location have been similar to SW4 with elevated concentrations during the summer months. Parameter concentrations in 2024 were stable and within historical ranges, except elevated concentrations for nickel (Nov) and iron (Nov). All parameter concentrations met the PWQO criteria in 2024, except for iron, phenols, and total phosphorus in November.

Surface water stations SW2 and SW3 are south of the waste mound and on the north side of Crystal Lake Road. SW2 has historically had water quality similar to background conditions with the exception of slightly elevated COD, DOC, sporadically elevated iron and total phosphorus, and an acidic pH. These variations in water quality have been in-part attributed to

the low-lying wetland environment. Conductivity, TDS, and chloride have also been elevated at this location; however, these parameter concentrations have been associated with road de-icing activities on Crystal Lake Road and the site entrance road. Salt influences the chemistry of the soil in which it infiltrates and can release metals (e.g., aluminum, zinc, copper, cobalt, mercury, cadmium) and base cations (calcium, magnesium, potassium) (Health Canada, 2001). Given the proximity of this location to the waste mound, but also to the site entrance road, Crystal Lake Road, and the ponded, wetland environmental, it is difficult to determine the source of the elevated concentrations. Regardless, concentrations have been stable over time and have generally met compliance criteria. Further, concentrations generally fall within ranges in the background water quality. Parameter concentrations were within historical ranges in 2024, except for elevated concentrations for lead, turbidity, nickel, and TSS in September. The following parameters did not meet the PWQO criteria in 2024: iron, total phosphorus, DO, and phenols (Sept).

Historically, SW3 has exhibited elevated concentrations of all LIPs assessed in surface water in comparison to background surface water quality. Similar to SW2, many elevated concentrations have been attributed to the stagnant, ponded conditions, often observed to be dry, road salt influences, and/or the waste site. SW3 has been historically ponded/dry during all sampling events and has only been sampled about half the monitoring events since 2012. A sample was collected in May 2024. All parameter concentrations were within historical range in 2024. Iron did not meet the PWQO criteria in 2024.

SW5 monitors surface water southwest of the property boundary on the north side of Crystal Lake Road. Historically, station SW5 had similar water quality to the background location (SW4) with no elevated LIPs or persistent PWQO exceedances. Parameter concentrations were within historical ranges in 2024 except for BOD, cobalt, and nickel in September. In 2024, the following parameters did not meet the PWQO criteria: DO (low) in September and iron and phenols in November.

Given the similarity in water quality between stations SW5 and SW6 to background water quality at SW4, these locations were not impacted by the Site. This was expected as monitors DP3 and DP4 were not impacted. Impacts were identified at station SW2 and were primarily

attributed to road salt activities and/or naturally occurring parameter associated with the low-lying wetland environment. This was also the case with station SW3. No increasing trends have been identified at these locations. SW5 remains unimpacted with no adverse impacts expected on the tributary of Union Creek or the Burnt River. Refer to Figure 7 through Figure 24 for time concentration graphs for select parameters.

4.4 Landfill Gas Monitoring

Landfill gas, specifically methane and carbon dioxide, is derived from the decomposition of organic wastes. The biological decomposition process results in the generation of landfill gas until some period, likely decades, after the landfilling of that waste ceases. Landfill gas presents a potential hazard because methane-air mixtures can be explosive at concentrations between 5% and 17% methane by volume (50,000 to 170,000 ppm) in air (Werner Sölken, 2021).

Once landfill gases are produced under the surface, they tend to migrate from the landfill through pore spaces within the refuse and cover material. Landfill gases are lighter than air and naturally tend to move upward, usually through the landfill surface. Where upward migration is restricted by densely compact waste or impermeable landfill cover, gases tend to migrate horizontally. Generally, a landfill's peak production of gas occurs within five to seven years following closure and gas is no longer produced 20 years following closure; however, small quantities of gas may continue to be emitted from a landfill for 50 or more years.

Landfill gas monitoring was completed to assess compliance with Section 4.10 of *Landfill Standards, A Guideline on the Regulatory and Approval Requirements for New and Expanding Landfilling Sites* (MOEE, 1998), which states that methane gas concentrations must be:

- less than 2.5% methane gas in the subsurface at the property boundary,
- less than 1.0% methane in an on-site building, or its foundation, and
- less than 0.05% methane (i.e. not present) in a building, or its foundation, which is located off-site.

Landfill gas measurements were taken on May 30 and November 13, 2024 (Appendix C). Landfill gas monitoring at DP3 was not completed due to the cap being stuck and unable to remove for reading. Methane concentrations were less than the compliance criteria (2.5% methane by volume or 25,000 ppm) during all monitoring events.

4.5 Adequacy of Monitoring Program

To have a refined and concise monitoring program at the Site, the existing monitoring program is reviewed annually to determine if it sufficiently monitors impacts at the Site. Following the 2024 assessment, the monitoring program continued to effectively characterize site conditions, groundwater and any groundwater discharges from the Site, and includes data that relates to background water conditions. At the Site, in whole or in part:

- All monitoring wells were confirmed to be in good condition and secure.
- All fieldwork for groundwater and surface water investigations were done in accordance with the established SOPs (including internal/external QA/QC).
- All groundwater and surface water sampling for the monitoring period were successfully completed in accordance with the ECA.
- The Site has an adequate buffer, contaminant attenuation zone (CAZ), and contingency plans in place.
- Design and operational measures, including size and configuration of the CAZ, were adequate to prevent potential human health impacts and impairments of the environment.
- The Site generally met compliance and assessment criteria.

5.0 Site Operations

This section presents a summary of site operations in 2024 and addresses the requirements detailed in ECA Conditions 5.1 and 5.3.

- A summary of Site inspections (Section 5.4).
- A report on the condition of all monitoring wells and a statement to compliance with R.R.O. 1990 Regulation 903: Wells (Reg. 903, Section 5.7).
- A monthly balance of waste received and removed from the Transfer Station (Table 7).
- A summary of any rejected wastes (Section 5.6).
- A summary of any incidents (Section 5.5).
- A summary of complaints received (Section 5.5).
- Any changes to the Site Operations and Maintenance Manual and/or the Transfer Station Safety and Emergency Response Procedures since the last annual report (Section 5.9).
- A statement as to compliance with all conditions of the ECA, a description of any operational changes, and/or Transfer Station improvements undertaken and all other operational issues (Section 5.9 and Section 5.10).
- Any recommendations to minimize environmental impacts from the operation of the Site and to improve operations and monitoring programs in this regard (Section 5.4).

5.1 Site Access and Security

Site access is controlled from Crystal Lake Road by a chain linked fence which was in good condition in 2024. An access card is provided to all tax paying residents of the Municipality, where access is only permitted during operational hours and with the presence of a site attendant.

Signage is posted at the gate which lists the hours of operation, that the site uses video surveillance, and a reminder of the Municipality’s clear bag policy. Additional signage is on-site which lists acceptable waste types.

The hours of operation in 2024 were:

Winter (September 16 to April 14)
Wednesday ..... 8:00 AM to 2:00 PM
Saturday..... 8:00 AM to 4:00 PM
Sunday..... 11:00 AM to 4:00 PM
Summer (April 15 to September 15)
Monday ..... 8:00 AM to 1:00 PM
Wednesday ..... 8:00 AM to 2:00 PM
Saturday..... 8:00 AM to 4:00 PM
Sunday..... 11:00 AM to 7:00 PM

The Site is closed on Christmas Day, New Year's Day, Easter Monday, Canada Day, and Family Day.

The Site is open on Victoria Day, Civic Holiday, Labour Day, and Thanksgiving Monday and operates on Sunday Hours.

5.2 Operating Procedures

All waste disposal and transfer operations were conducted under the supervision and direction of the site attendant in 2024, employed by the Municipality. The site attendant was responsible for ensuring that the safe and orderly operation and maintenance of the site complied with the requirements of the ECA and the *Environmental Protection Act* and its Regulations as administered by the Ministry. In addition, the site attendant's responsibilities included:

- Controlling admission of authorized vehicles with acceptable wastes
- Ensuring proper daily litter control
- Controlling collection and haulage of materials by a licensed hauler
- Maintaining a daily record of all operations which are available for inspection by the Ministry

As part of the daily operation of the Site and outlined in the Standard Operating Procedures (MTL, 2020a), the site attendant used the following forms on each operating day, as applicable:

- TS-1 Daily Inspection Form

- TS-2 Issues and Deficiencies Forms
- TS-3 Daily Incoming Waste Form
- TS-4 Tipping Fee Form
- TS-5 Tire Form
- TS-6 Reuse Centre Form
- TS-7 Unaccepted Refused Waste & Entry Form
- TS-8 Complaint Form
- TS-9 Daily Record of Material Removed Form

5.3 Training

Staff from the Municipality and private contractors operated the Site. All employees working at the transfer station are properly trained for the tasks that they are expected to perform and are provided with continued on-the-job training. No formal training was completed in 2024; however, the Municipality offered health and safety, and on-the-job training related to the operations of the Site.

In 2023, three new staff members received on-boarding training which included fire extinguisher safety, paintball gun training for bear control, and proper lifting techniques.

In 2022, all site attendants completed paintball gun training for bear control, productive conflict training, and a refresher course on Workplace Hazardous Material Information Systems (WHMIS). In addition, meetings were held on April 11 and September 29, 2022 to discuss the following: upcoming waste events, waste documentation, a review on the ECA, the *Transfer Station, Safety, Emergency, and Spills Procedures* (MTL, 2020b), and the *Transfer Station Standard Operating Procedures* (MTL, 2020a), etc.

5.4 Site Inspection

The following section discusses observations during site inspections conducted by Cambium and information provided by the Municipality in 2024.

In 2024, daily site inspections of the on-site equipment and facilities were completed by the site attendant, as per ECA Conditions 2.6 and 3.18. Records of these inspections are kept on-site as required be ECA Condition 4.1.

There were no environmental and/or operational problems that were negatively impacting the environment observed by Cambium or the Municipality during site inspections in 2024. As such, no recommendations are suggested to minimize environmental impacts or improve site operations.

5.4.1 Litter Control

Cambium staff noted that the Site was in good condition with minimal evidence of blown litter during site visits in 2024. The Municipality reported that litter cleanup is completed as needed based on observations completed during the daily site inspections.

The intent of good housekeeping practices is to protect on-site worker health and safety, and the surrounding environment from nuisance effects. Nuisance effects are minimized by adopting good housekeeping measures as part of the Site operations. Regular housekeeping is essential to control such nuisances as:

- Blowing and loose litter
- Odour
- Rodents and insects
- Scavenging birds

5.4.2 Roads

The access road has sufficient width at the entrance and within the Site to allow unimpeded winter travel and access for emergency and snow removal equipment. The site access roads were observed to be well maintained and graded and were reported to be regularly cleared of snow with a sand mixture applied as needed by the Municipality during the winter months.

5.4.3 Final Cover Integrity

The waste mound was adequately covered and there was minimal evidence of erosion from areas visited by Cambium staff in 2024.The waste mound was well vegetated, which is an effective erosion control measure. Riprap is installed on a portion of the northern slope as an additional erosion control measure.

5.5 Complaints and Incidents

ECA Condition 3.19 requires the Municipality to record the nature of the complaint and remediate the issue to prevent recurrence in the future. The Municipality reported that there were no complaints received regarding the Site in 2024. The following incidents were reported in 2024:

- One incident of trespassing involving theft. The Ontario Provincial Police (OPP) was notified following this incident.
- A staff member injured their hand after lifting a heavy item. An accident report was completed, and a reminder of health and safety protocols was provided.

5.6 Waste Refusal

The Municipality has a Clear Bag Policy. Any garbage bag that has any visible blue box materials, municipal hazardous and special wastes (MHSW), or more than 20% divertible items (i.e., clothing, organics, WEEE), is not accepted at the Site. The site attendant is required to fill out the “TS-7 Unaccepted Refused Waste and Entry” form as detailed in the Municipal document *Transfer Station Standard Operating Procedures* (MTL, 2020a). The Municipality keeps these forms on file.

5.7 Monitoring Well Security

As part of the 2024 groundwater monitoring program, all monitoring wells listed in Table 1 were inspected and complied with Reg. 903. Refer to Appendix E for photographs of the monitoring wells.

5.8 Materials Summary

The following approved waste types listed below were accepted at the Site in 2024; refer to Figure 4 for the collection locations of each material.

- Household Waste
- Blue Box Materials
- Construction and Demolition (C&D) Materials
- Bulky Items
- Limited MHSW
- Leaf and Yard Waste
- Tires
- Scrap Metal
- White Goods
- WEEE

In January 2022, waste by-law B2022-004 was revoked and replaced with B2022-036 for the purposes of updating waste disposal fees, site hours, and additional detail on acceptable and prohibited waste types.

The quantities and types of MHSW that can be accepted at the Site are as follows:

- A maximum of 200 vehicular batteries
- A maximum of three 250 L drum of lithium, dry cell, and/or rechargeable batteries
- A maximum of six 250 L capacity container for the bulk collection of empty motor oil containers
- A maximum of 300 units of fluorescent light bulbs

A maximum volume of 150 m^3 of MHSW can be stored at the Site at one time. Furthermore, the Site may only accept a maximum of 20 m^3 of MHSW per day.

5.8.1 Re-Use Centre

The Municipality operated a Re-Use Centre at the Site for specific materials from the spring until autumn annually. The Municipality reported that about four - 30 m^3 bins of materials were diverted from the Crystal Lake in 2024. Acceptable Items: Small furniture, sporting goods, toys, books, housewares, select furniture, novelty items, memorabilia and collectibles, and bicycles.

Unacceptable Items: Including but not limited to; couches and large chairs, mattresses, electronics, CFC appliances, clothing and footwear, linens, auto parts, unsanitary items, and bulky items.

5.8.2 Site Usage

Site usage, as documented by the Municipality, is summarized in Embedded Table 7. Waste collected is transferred to the Peterborough Waste Management Facility except for C&D Materials which are hauled to Waste Connections. Refer to Table 7 for a monthly summary of materials accepted and transferred at the Site.

Embedded Table 7 Summary of Site Usage

	2024	2023	2022	2021	2020
Vehicles – Private	8,905	9,821	9,794	11,215	11,116
Bags of Garbage	11,143	12,138	12,189	13,926	14,220
Waste – Tonnes[1]	122.26	115.08	128.24	139.71	136.97
C&D Materials – Tonnes	31.38	24.51	32.55	45.34	44.87

Notes:
1. Material transported to the Peterborough Waste Management Facility.

5.8.3 Site Diversion

Embedded Table 8 provides a summary of the materials diverted from landfilling in 2024, as reported by the Municipality and the County of Peterborough. Additionally, 245 m^3 of brush were accepted at the Site in 2024 which was chipped and used as cover for rehabilitation on municipal properties.

Embedded Table 8 Summary of Diverted Materials

Material	tonnes
Blue Box	
Containers	24.77
Fibres	27.96
Empty Oil/Anti-freeze Containers	0.06
Scrap Metal and White Goods	26.01
Durable Plastics	0.97
WEEE	7.01
TOTAL	**86.78**
Material	**Unit**
Alcohol Containers	40,950
Tires	137 units
Fluorescent Tubes[1]	238 m

Notes:

1. *Municipality total in 2024*

5.8.4 Municipal Wide Diversion

The Site is approved to accept limited MHSW, as are various other transfer stations in the Municipality including the Bobcaygeon, Buckhorn, and Cavendish sites. In 2024, the Municipality accepted 0.41 tonnes of single-cell batteries, and 0.183 tonnes of car batteries.

Three mattress collection events were held at the Municipality's waste disposal sites in 2024. A total of 292 mattresses were collected.

Throughout 2024, 3.35 tonnes of textiles were collected from all sites.

A seasonally operated durable plastics event is run by the Municipality. In 2024, 18.01 tonnes of durable plastics were collected from all municipally operated waste disposal sites.

The Municipality provides its residents with numerous methods to promote waste diversion at home. The following items were sold in 2024:

- Composters: 12 units
- Digestors: 5 units

- Kitchen Catcher (compost bins): 11 units
- Foodcycler: 121 units

5.9 Site and Documentation Reviews and Updates

The following documents are maintained by the Municipality, reviewed annually, and updated as required.

- Current Design and Operation Plan consisting of:
  - *Crystal Lake Landfill Site - Closure Plan* prepared for the Township of Galway-Cavendish and Harvey by TSH dated September 2002 and subsequent correspondence between the Ministry and TSH including the letter dated June 28, 2006 addressed to Mr. Dale Gable, Ministry of the Environment from Ms. Colleen Carter, TSH providing updated drawings for the closure of the landfill.
  - Letter dated June 9, 2008 requesting an amendment to an existing Certificate of Approval, signed by Catrina Switzer, Environmental Services, County of Peterborough, including all supporting information.
  - Environmental Compliance Approval application, signed by Lois O-Neill-Jackson, CAO/Economic Development Officer, Municipality of Trent Lakes, dated May 10, 2016 and subsequent correspondence from Cambium to the Ministry, dated May 10, 2016, re: description of proposed changes sought under the application to amend ECA No. A341202 including Figure 2, Proposed Site Layout, dated May 2016.
  - Environmental Compliance Approval application and supporting documentation dated November 19, 2020.
- *Municipality of Trent Lakes – Transfer Station Standard Operating Procedures* (MTL, 2020a)
- *Municipality of Trent Lakes – Transfer Station Safety, Emergency and Spills Procedures* (MTL, 2020b)

The Crystal Lake waste Transfer Station, *Design and Operations Plan*, and The *Standard Operating Procedures* and *Emergency Spills Procedure* are maintained by the municipality and updated as required. No changes were made to these documents in 2024. Copies of the operations procedures and emergency and spills procedures are included with this report digitally.

5.10 Compliance with Environmental Compliance Approval

Based on the scope of work completed at the Crystal Lake transfer station, the information provided by the Municipality of Trent Lakes, and the results of monitoring program compliance with all conditions of the ECA were achieved in 2024.

6.0 Conclusions and Recommendations

Based on the 2024 monitoring program, Cambium provides the following conclusions regarding the Crystal Lake transfer station:

- Results of the groundwater elevation monitoring indicated that groundwater flowed toward the northwest from the waste mound.
- Given the presence of the low-lying wetland area to the northwest of the waste mound and the unimpacted nature of monitors DP3 and DP4, groundwater discharges to surface at the toe of the waste mound.
- Leachate was characterized by the nested monitor in the waste mound (MW1) in the deep and shallow bedrock units. Based on a review of the average LIP concentrations compared to background monitors BH16-1S and BH16-1D, the greatest impacts occurred in the shallow bedrock unit (MW1-U), consistent with the conceptual site model.
- Site-related impacts have been present immediately cross-gradient (to the southwest) of the waste mound at monitor DP1, which indicated that leachate is present primarily toward the southwest of the waste mound (in groundwater). Some elevated parameter concentrations were naturally occurring or were attributed to road salt impacts. The Site has been closed to landfilling since 2002, and concentrations trends have generally been stable.
- A review of groundwater quality data indicated that the Site complied with the RUC and site-specific groundwater trigger in 2024 (MOEE, 1994a).
- The results of the surface water monitoring program indicated that site-related impacts may be occurring at stations SW3 and SW2; however, various other impacts were evident such as road salt impacts and elevated concentrations due to ponded, wetland environments. All remaining surface water locations were not impacted by the Site. Based on this assessment and the unimpacted nature of station SW5, the Site was not adversely impacting the downstream tributary of Union Creek.

- According to Municipal and County records, 122 tonnes of waste, 53 tonnes of containers and fibres, 31 tonnes of construction and demolition materials, and about 87 tonnes of various other materials were accepted and transferred off-site in 2024. Not included in these tonnages were 245 m³ of brush, 137 tires, and 40,950 alcohol containers.
- The property area of 12.13 ha owned by the Municipality of Trent Lakes was considered sufficient for operational buffer and contaminant attenuation zone purposes in 2024 for the Crystal Lake transfer station site.
- The Site was operated in compliance with the ECA in 2024.

Based on the 2024 monitoring program, the following recommendations are provided:

- The groundwater and surface water program should be continued in 2025 in accordance with appended Table 1.

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Glossary of Terms

- **Active Face/Area**
  The portion of the landfill facility where waste is currently being deposited, spread and/or, compacted prior to the placement of cover material.
- **Adverse Environmental Impact**
  Any direct or indirect undesirable effect on the environment resulting from an emission or discharge that is caused or likely to be caused by human activity.
- **Annual Report**
  Report documenting the results of water quality, environmental quality, and operations monitoring for the year, or for a period as prescribed in the Certificate of Approval.
- **Approved Design and Operations Plan**
  The design of a landfill site and its facilities which have been submitted along with the application documents for which formal Ministry approval has been issued through the Certificate of Approval.
- **Approved Site or Facility**
  A landfill site/facility for which there is an existing and current Certificate of Approval.
- **Aquifer**
  A geologic unit (soil or rock) that contains sufficient saturated permeable material to yield measurable quantities of water to wells and springs.
- **Attenuation**
  Natural process through which the concentrations of landfill generated contaminants are reduced to safe levels.
- **Borehole**
  A hole drilled for soil sampling purposes.
- **Buffer Area**
  An area of land situated within the peripheral area surrounding an active filling area, but limited in extent to the property boundary, assigned to provide space for remedial measures, contaminant control measures, and for the reduction or elimination of adverse environmental impact caused by migrating contaminants.
- **Certificate of Approval**
  The license or permit issued by the Ministry for the operation of a landfill site. Issued to the owner of the site with conditions of compliance stated therein.
- **Contaminant**
  A compound, element, or physical parameter, usually resulting from human activity, or found at elevated concentrations that have or may have a harmful effect on public health or the environment.
- **Contaminant Migration Path**
  Route by which a contaminant will move from the site into adjacent properties or the natural environment. Usually a route that offers the least resistance to movement.
- **Contamination Attenuation Zone**
  The zone beneath the surface, located beyond the landfill site boundary, where contaminants will be naturally attenuated to predetermined levels. Also, see Reasonable Use Policy.
- **Contingency Plan**
  A documented plan detailing a co-ordinated course of action to be followed to control and remediate occurrences such as a fire, explosion, or release of contaminants in an uncontrolled manner that could threaten the environment and public health.
- **Cover Material**
  Material approved by the Ministry that is used to cover compacted solid waste. Usually, a soil with suitable characteristics for specific end-use.
- **Site Development Plan and Operations Report**
  Development and Operations Plan or Report is a document detailing the planned sequence of activities through the landfill site's active life, the control systems, site facilities and monitoring systems that are necessary. This document is required for obtaining a Certificate of Approval.
- **Design Capacity**
  The maximum amount of waste that is planned to be disposed of at a landfill site.
- **Detection Limit**
  Concentration under which a parameter cannot be quantitatively measured.

- **EAA or EA Act**
  Environmental Assessment Act, Revised Statutes of Ontario, 1990. One of the primary acts of legislation intended to protect, conserve, and wisely manage Ontario's environment through regulating planning and development.
- **Environmental Compliance Approval**
  The license or permit issued by the Ministry for the operation of a landfill site. Issued to the owner of the site with conditions of compliance stated therein.
- **EPA**
  Environmental Protection Act, Revised Status of Ontario, 1990. EPA is another of the primary pieces of Provincial legislation governing the protection of the natural environment of the Province.
- **Evapotranspiration**
  The evaporation of all water from soil, snow, ice, vegetation and other surfaces, including the water absorbed by plants, that is released to the atmosphere as vapour.
- **Fill Area**
  The area of a landfill site designed and designated for the disposal of waste.
- **Final Cover**
  Soil material or soil in combination with synthetic membranes, overlain by vegetation in a planned landscape, placed over a waste cell that has reached the end of its active life.
- **Groundwater**
  Subsurface water that occurs beneath the water table in soils and rocks that are fully saturated.
- **Hydraulic Conductivity**
  The rate of flow of water through a cross-section under a specific hydraulic gradient. It is a property of the geologic formation and the fluid, in hydrogeologic applications where the fluid is water (Units of m/day or cm/s).
- **Hydraulic Gradient**
  The head drop per unit distance in the direction of flow, the driving force for groundwater flow.
- **Hydrogeology**
  The study of subsurface waters and related geologic aspects of surface waters.
- **Impermeable Fill**
  Soil material that is placed as filling material that is sufficiently cohesive and fine grained to impede and restrict the flow of water through it.
- **In situ Testing**
  Testing done on-site, in the field, of material or naturally occurring substances in their original state.
- **Landfill Gas**
  Combustible gas (primarily methane and carbon dioxide) generated by the decomposition of organic waste materials.
- **Landfill Site**
  A parcel of land where solid waste is disposed of in or on land for the purposes of waste management.
- **Leachate**
  Water or other liquid that has been contaminated by dissolved or suspended particles due to contact with solid waste.
- **Leachate Breakout**
  Location where leachate comes to the ground surfaces; a seep or spring.
- **Limit of Filling**
  The outermost limit at which waste has been disposed of, or approved or proposed for disposal at a landfill.
- **Ministry**
  Ontario Ministry of the Environment, Conservation and Parks.
- **Monitoring**
  Regular or spontaneous procedures used to methodically inspect and collect data on the performance of a landfill site relating to environmental quality (i.e., air, leachate, gas, ground or surface water, unsaturated soils, etc.).
- **Monitoring Well**
  The constructed unit of casing (riser and screen) installed in a borehole.
- **Multi-Level Monitoring Well**
  More than one monitoring well installed at a given test well location.
- **Native Soil**
  Soil material occurring naturally in the ground at a location.

- **Natural Attenuation**
  Where contaminants are reduced to acceptable concentration levels by natural mechanisms (dilution, absorption onto the soil matrix, etc.), biological action, and chemical interaction.
- **Occupational Health and Safety Act**
  The primary act of legislation enacted by Ontario Ministry of Labour to regulate and control the safety in the workplace; also Occupational Health and Safety Act, Revised Statutes of Ontario, 1990.
- **Odour Control**
  Minimizing or eliminating the nuisance and undesirable impact of objectionable or unpleasant odours arising from waste disposal operations.
- **Open Burning**
  Burning any matter whereby the resultant combustion products are emitted directly to the atmosphere without passing through an adequate stack, duct, or chimney.
- **Operations Plan**
  A document detailing the waste disposal operations in a planned, and if necessary, a staged manner, that ensure compliance with regulatory provisions concerning the operations of a landfill site.
- **Operator (Site Operator)/Attendant**
  The individual or organization who, through ownership or under contract, manages and operates a landfill site for the purpose of waste disposal.
- **Owner**
  A person, persons, organization, or municipal authority who own a landfill facility or part of a landfill facility, and in whose name the Certificate of Approval for the site is issued.
- **Percolation**
  The movement of infiltrating water through soil.
- **Permeability**
  Often used interchangeable with hydraulic conductivity, but not strictly correct. Permeability is a property of the porous media only. Dependent upon media properties that affect flow, diameter, sphericity, roundness, and packing of the grains.
- **Piezometer**
  A well that intersects a confined aquifer.
- **Provisional Certificate of Approval (Provisional C of A)**
  Same as Certificate of Approval.
- **Reasonable Use Policy**
  A policy developed by the Ministry to stipulate limits to the level of groundwater quality impairment that may be permitted to occur at site property boundaries, to allow the reasonable use of adjacent properties or land without adversely affecting public health and the environment.
- **Recharge Zone**
  An area where precipitation or surface run-off infiltrates into the ground and then, through natural percolation enters an aquifer.
- **Recycling**
  Sorting, collecting or processing waste materials that can be used as a substitute for the raw materials in a process or activity for the production of (the same or other) goods. For example, the "Blue Box" system, in-plant scrap handling, or raw material recovery systems. Recycling is also the marketing of products made from recycled or recycled materials.
- **Reduction (of waste or component of 3Rs program)**
  Those actions, practices, or processes that result in the production or generation of less waste.
- **Remedial Action**
  Corrective action taken to clean-up or remedy a spill, an uncontrolled discharge of a contaminant, or a breach in a facility or its operations, in order to minimize the consequent threat to public health and the environment.
- **Representative Sample**
  A small portion of soil, water, etc. which can be subjected to testing and analysis, that is expected to yield results that will reliably represent the identical characteristics of the source of the material or of a larger body of material.
- **Reuse (component of 3Rs program)**
  The use of an item again in its original form, for a similar purpose as originally intended, or to fulfil a different function.
- **Run-off**
  The part of precipitation (rainwater, snowmelt) that flows overland and does not infiltrate the surface material (soil or rock).

- **Saturated Zone**
  The zone of a subsurface soil where all voids are filled with water.
- **Sedimentation**
  The deposition of fine grained soil in an undesirable location, caused by the scouring, erosion and transportation of earth materials by surface run-off.
- **Sensitive Land Use**
  A land use where humans or the natural environment may experience an adverse environmental impact.
- **Settlement**
  The subsidence of the top surface and underlying waste of a landfill or waste cell as a result of densification under its own weight.
- **Site Capacity**
  The maximum amount of waste that is planned to be disposed (design capacity) or that has been disposed of at a landfill site.
- **Site Closure**
  The planned and approved cessation or termination of landfilling activities at a landfill site upon reaching its site capacity.
- **Site Life**
  The period from its inception through active period of waste disposal, to the time when a landfill site reaches its' site capacity, when it ceases to receive any further waste, including and up to closure.
- **Solid Waste**
  Any waste matter that cannot be characterized by its physical properties as a liquid waste product.
- **Solid Waste Disposal Site or Facility**
  A site or facility such as a landfill site where solid waste is disposed of.
- **Source Separation**
  The separation of various wastes at their point of generation for the purposes of recycling or further processing.
- **Standpipe**
  A monitoring well that intersects the water table aquifer.
- **Storm water**
  Run-off that occurs as a direct result of a storm event or thaw.
- **Storm water Detention**
  Control of storm water by the construction of impoundments of structures for the purpose of regulating storm water flows during high intensity rainfall events that would otherwise transport excessive amounts of sediment, cause soil erosion or cause flooding.
- **Stratigraphy**
  The geologic sub-structuring, usually layered with different distribution, deposition and age.
- **Surface Run-off (Drainage)**
  See Run-off.
- **Surface Water**
  Water that occurs at the earth's surface (ponds, streams, rivers, lakes, oceans).
- **Sub-Soil**
  Soil horizons below the topsoil.
- **Test hole**
  A hole drilled for soil sampling purposes.
- **Topsoil**
  The uppermost layer of the soil containing appreciable organic materials in mineral soils. Adequate fertility to support plant growth.
- **Unsaturated Zone**
  The zone (also vadose zone) in a porous sub-soil, where the voids are not completely water-filled, but contain some air-filled voids. Limited above by the land surface and below by the water table.
- **Vector**
  A disease carrier and transmitter; usually an insect or rodent.
- **VOC**
  Volatile organic compounds are those compounds that will readily volatilize (convert from liquid to gas phase) at conditions normally found in the environment.

- **Waste**
  Ashes, garbage, refuse, domestic waste, industrial waste, or municipal refuse and other used products as are designated or interpreted by the provisions of the Environmental Protection Act.
- **Waste Disposal Site (Facility)**
  Any land or land covered by water upon, into, in or through which, or building or structure in which, waste is deposited or processed and any machinery or equipment or operation required for the treatment or disposal of waste.
- **Waste Management System**
  All facilities, equipment and operations for the complete management of waste, including the collection, handling, transportation, storage, processing and disposal thereof, and may include one or more waste disposal sites.
- **Water Table**
  The water level attained in a monitoring well, which screens the surficial unconfined aquifer.
- **Water Balance**
  Amounts of water to various components in a system so that water entering the system equals the amount of water contained within and discharged out of a system.
- **Water Level**
  The level of water in a well.
- **Well Casing**
  The pipe that is used to construct a well.
- **Well Screen**
  A filtering device used to keep sediment from entering a well.
- **Wetlands**
  Areas where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrolytic vegetation, and which have soils indicative of wet conditions.

Abbreviations

RFP	Request For Proposal
ha	hectare
Ministry	Ontario Ministry of the Environment, Conservation and Parks
tonne	metric ton
MNRF	Ontario Ministry of Natural Resources and Forestry
t	metric tonne
ECA	Environmental Compliance Approval
µS	microSiemens
EPA	Environmental Protection Act
ODWQS	Ontario Drinking Water Quality Standards
EAA	Environmental Assessment Act
PC of A	Provisional Certificate of Approval
MW	monitoring well
PWQO	Provincial Water Quality Objectives
masl	metres above sea level
TOC	Total Organic Carbon
pg	picogram
VOC	Volatile Organic Compound
ng	nanogram
BTU	British Thermal Unit
µg	microgram
°C	temperature in degrees Celsius
g	gram
N/A	not available
kg	kilogram
%	percent
L	Litre
cfm	cubic feet per minute
mg/L	milligrams per litre
ppmdv	part per million by dry volume
mm	millimetre
ppmv	part per million by volume
m	metre
ppm	part per million
km	kilometre
min	minimum
m^3	cubic metre
max	maximum
m^2	square metre

Standard Limitations

Limited Warranty

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Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

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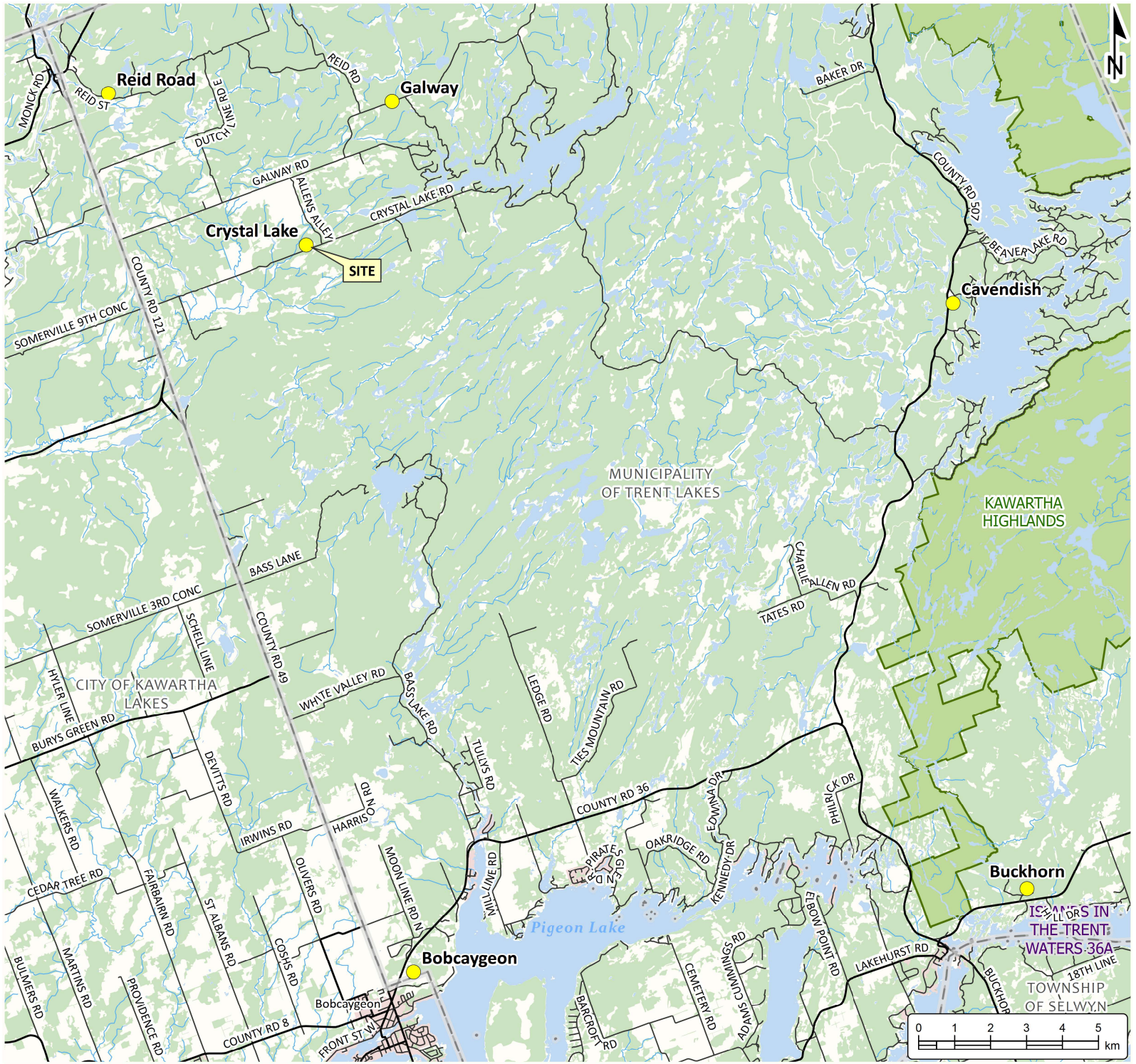
Appended Figures



CRYSTAL LAKE TRANSFER STATION

665 CRYSTAL LAKE ROAD
Trent Lakes, Ontario
Municipality of Trent Lakes

LEGEND

- Trent Lakes Waste Disposal Sites
- Major Road
- Minor Road
- Watercourse
- First Nations Reserve
- Municipal Boundary
- Provincial Park
- Built Up Area
- Wooded Area
- Water Area

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SITE LOCATION PLAN

Project No.: 10520-003		Date: March 2025	Rev.:
Scale: 1:150,000		Projection: NAD 1983 UTM Zone 17N	
Created by: DBC	Checked by: SNR	Figure: 1	

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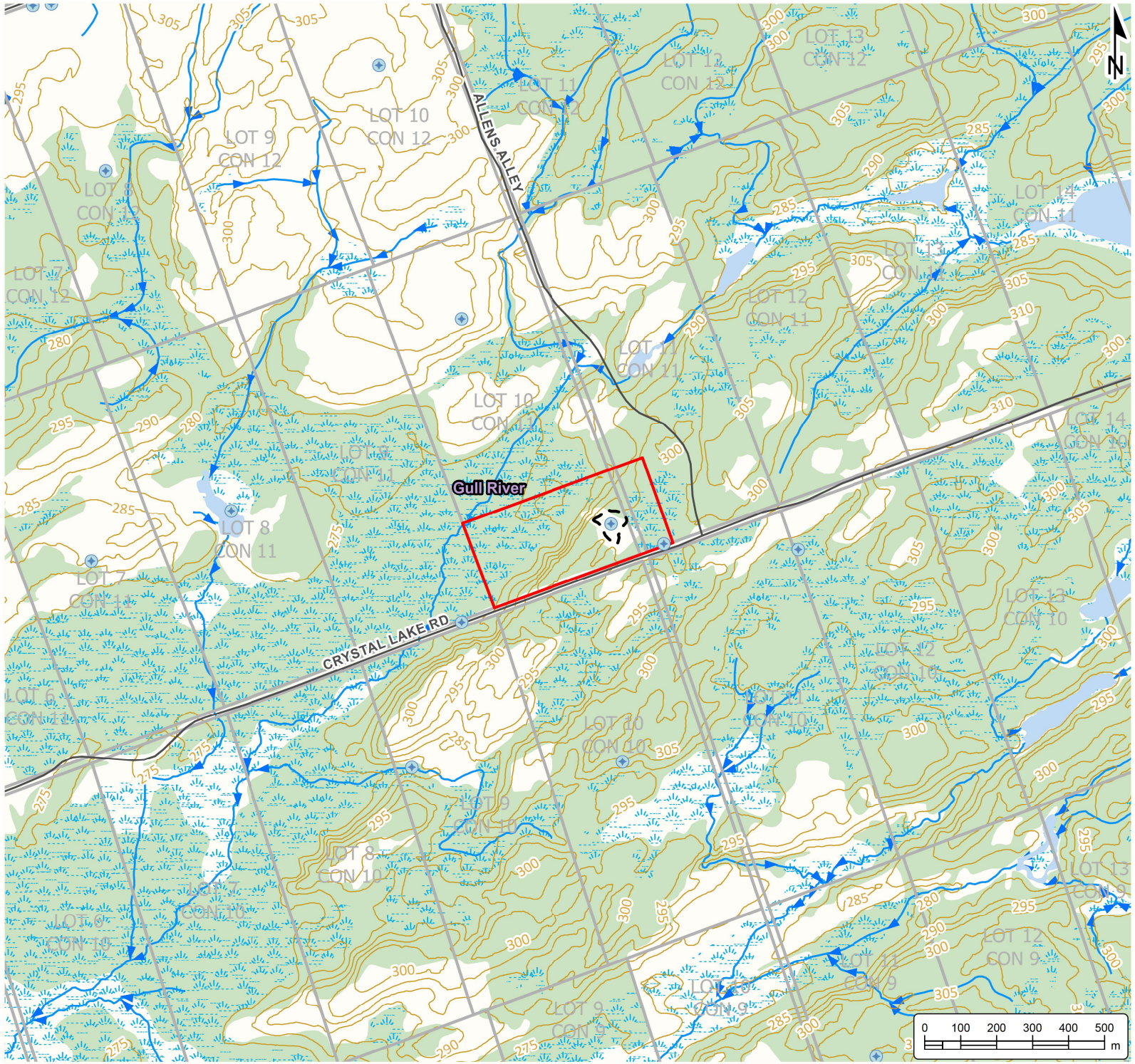
CRYSTAL LAKE TRANSFER STATION

665 CRYSTAL LAKE ROAD
Trent Lakes, Ontario
Municipality of Trent Lakes



LEGEND

- Ministry Well Record
- Minor Road
- Watercourse, Permanent
- Contour (5m Interval)
- Limit of Waste
- Property Boundary (12.73 ha)
- Lot/Concession
- OWB Tertiary Watershed
- Unevaluated Wetland
- Water Area
- Wooded Area

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LOCAL TOPOGRAPHY PLAN

Project No.: 10520-003		Date: March 2025	Rev.:
Scale: 1:15,000		Projection: NAD 1983 UTM Zone 17N	
Created by: DBC	Checked by: SNR	Figure: 2	

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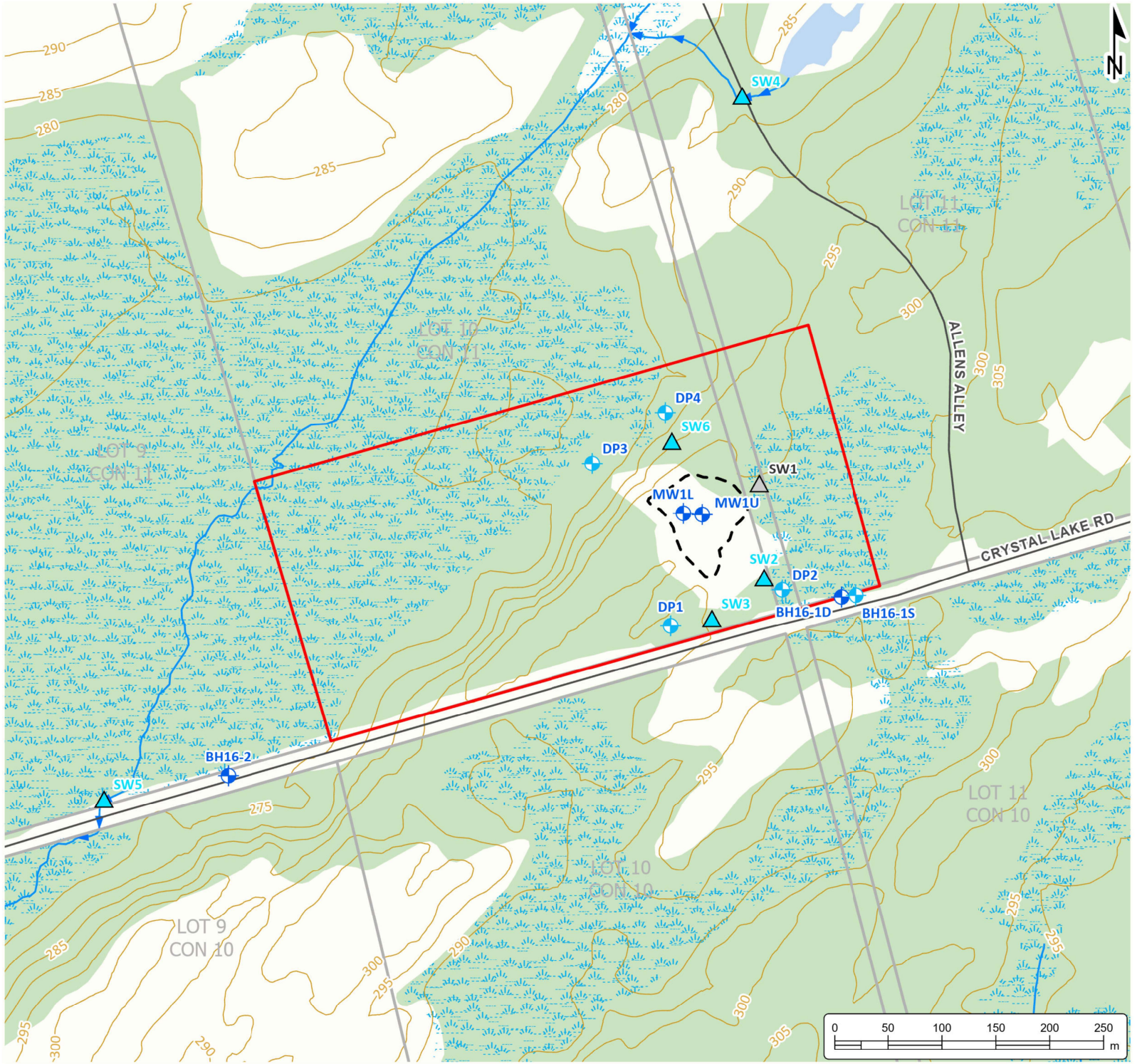

CRYSTAL LAKE TRANSFER STATION

665 CRYSTAL LAKE ROAD
Trent Lakes, Ontario
Municipality of Trent Lakes

LEGEND

- Monitoring Well Location
- Drive Point Location
- Surface Water Sampling Location
- Historic Surface Water Sampling Location
- Minor Road
- Watercourse, Permanent
- Contour (5m Interval)
- Limit of Waste
- Property Boundary (12.73 ha)
- Lot/Concession
- Unevaluated Wetland
- Water Area
- Wooded Area

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SAMPLE LOCATION PLAN

Project No.: 10520-003		Date: March 2025	Rev.:
Scale: 1:5,000		Projection: NAD 1983 UTM Zone 18N	
Created by: DBC	Checked by: SNR	Figure: 3	

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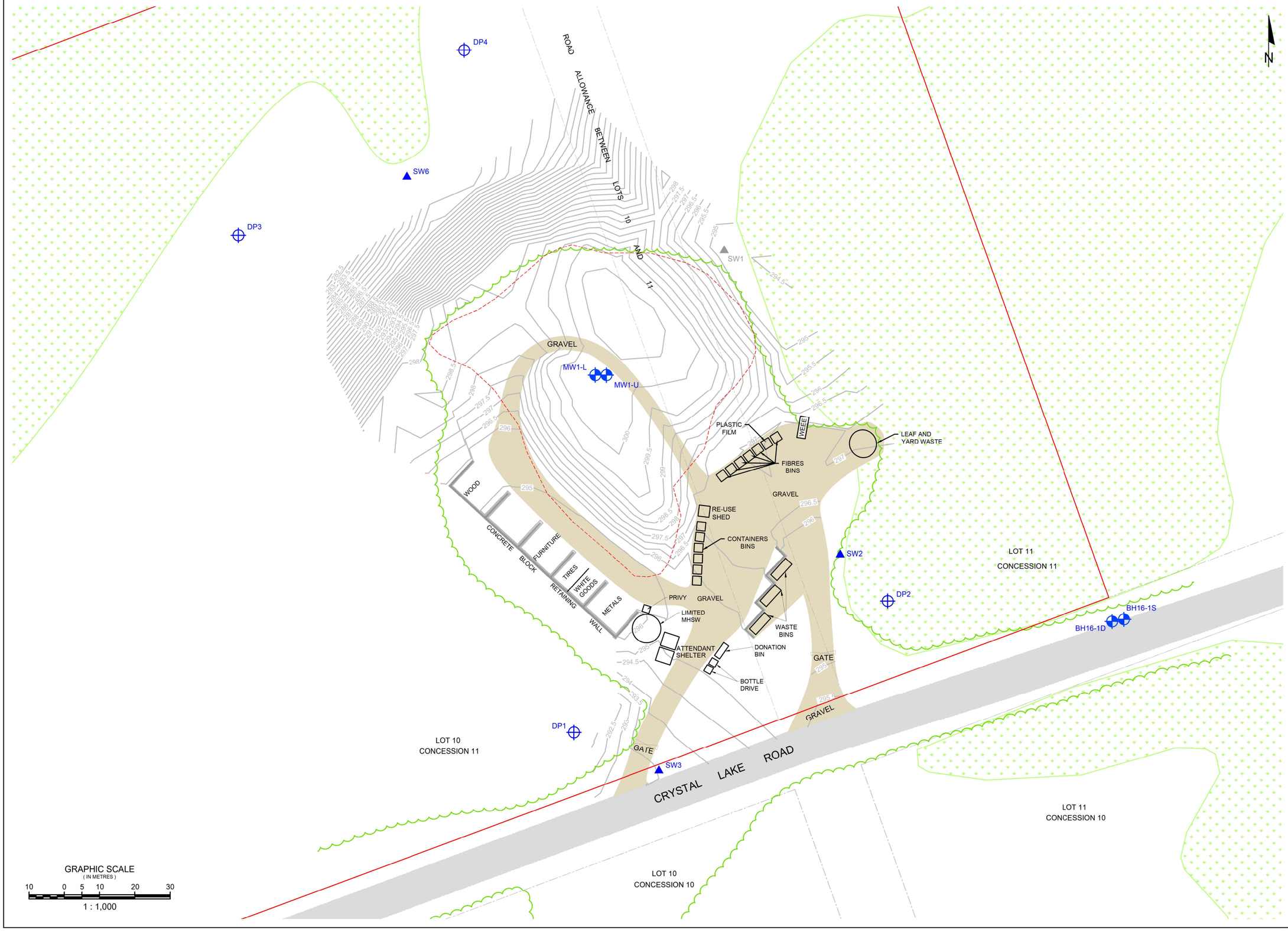
CRYSTAL LAKE TRANSFER STATION

665 CRYSTAL LAKE ROAD
Trent Lakes, Ontario
Municipality of Trent Lakes



GRAPHIC SCALE
(IN METRES)
10 0 5 10 20 30
1 : 1,000

LEGEND

- Surface Water Sample Location
- Historical Surface Water Sample Location
- Overburden Monitoring Well
- Bedrock Monitoring Well
- Topographic Contour Line
- Property Boundary (12.73 ha)
- Existing Limit of Waste (0.49 ha)
- Gate
- Gravel Road
- Asphalt Road
- Tree Line (Approximate)
- Wetland

Notes:

1. Base mapping features adapted from a site plan prepared by Coe Fisher Cameron Land Surveyors dated January 21, 2015.
2. Waste disposal site features are approximate and are adapted from a site plan prepared by WSP dated June 2014.
2. Wetland features are © Queen's Printer of Ontario, 2015 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).
3. Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
4. Projection: NAD 1983 UTM Zone 17T.

Benchmarks:

5. ORP A is an SIB located at the SW property corner (not shown on this plan).
   Northing: 4956462.4 Easting: 692696.7 Elevation: 273.90
6. ORP B is an SIB located at the SE property corner.
   Northing: 4956603.1 Easting: 693075.6 Elevation: 294.50
7. Elevations on site are derived from a temporary benchmark being a nail in a hydro pole having an elevation of 296.49 (cgvd28 -1978).
8. Elevations shown hereon are geodetic and are referred to Geodetic Surveys Canada Benchmark #0011971u206, being a tablet in the top of a concrete dam on the Bobcaygeon River in the Village of Bobcaygeon, 0.34m from the south end of the dam, having an elevation of 249.20m (cgvd28-1978).

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EXISTING SITE CONDITIONS

Project No.: 10520-003		Date: March 2025	
		Rev.:	
Horizontal Scale: 1:1,000		Projection: UTM Zone 17N	
Drawn By: TLC	Checked By: SNR	Figure:	4

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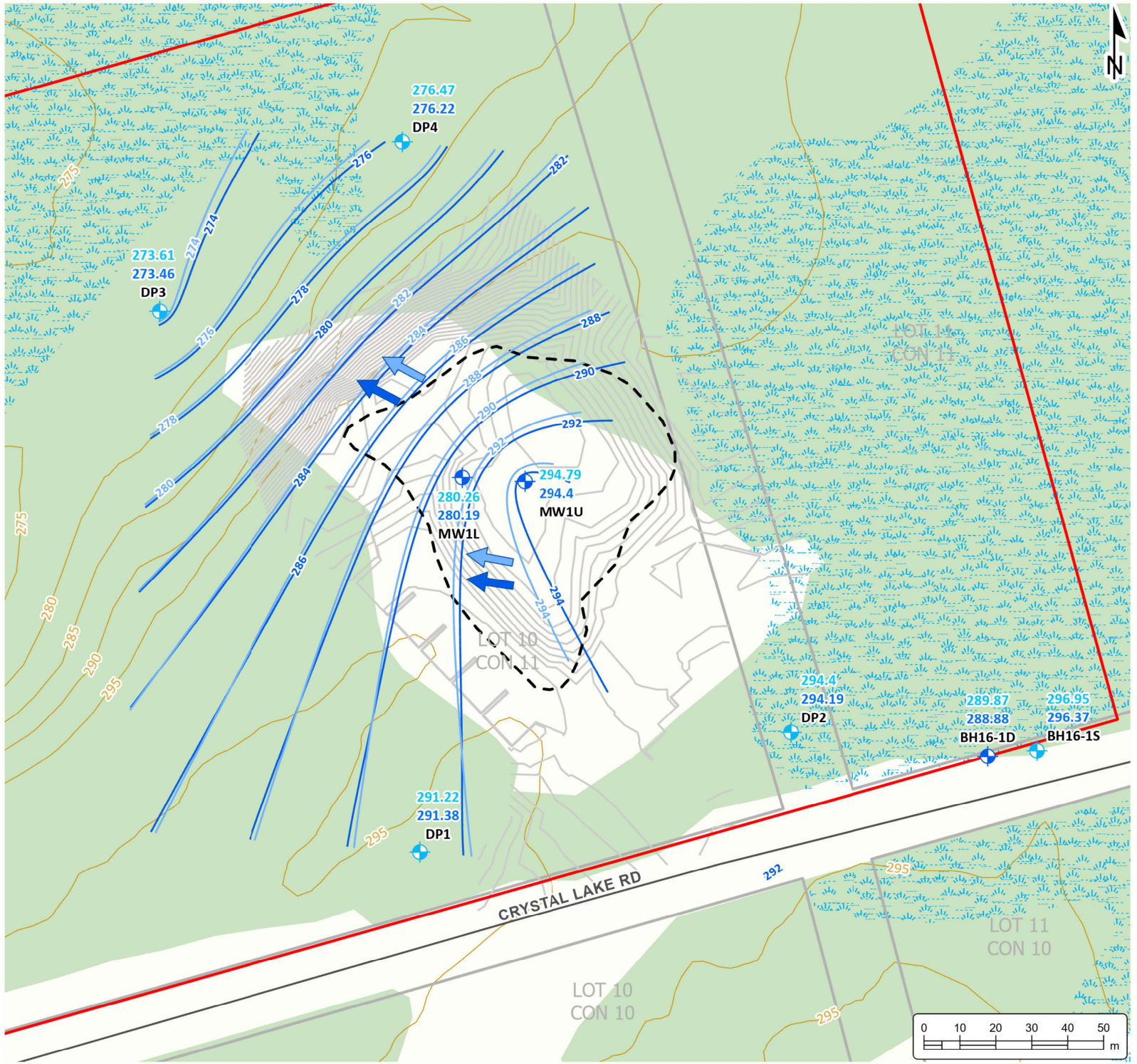

CRYSTAL LAKE TRANSFER STATION

665 CRYSTAL LAKE ROAD
Trent Lakes, Ontario
Municipality of Trent Lakes

LEGEND

- Bedrock Monitoring Well
- Overburden Monitoring Well
- Minor Road
- Contour (5m Interval)
- Groundwater Contour May 28, 2024
- Groundwater Contour November 13, 2024
- 295.95 Groundwater Elevation May 28, 2024
- 295.95 Groundwater Elevation November 13, 2024
- Groundwater Flow Direction May 28, 2024
- Groundwater Flow Direction November 13, 2024
- Limit of Waste
- Topographic Contour Line
- Property Boundary (12.73 ha)
- Lot/Concession
- Unevaluated Wetland
- Wooded Area

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GROUNDWATER CONFIGURATION

Project No.: 10520-003		Date: March 2025 Rev.:	
Scale: 1:1,500		Projection: NAD 1983 UTM Zone 18N	
Created by: DBC	Checked by: SNR	Figure:	5

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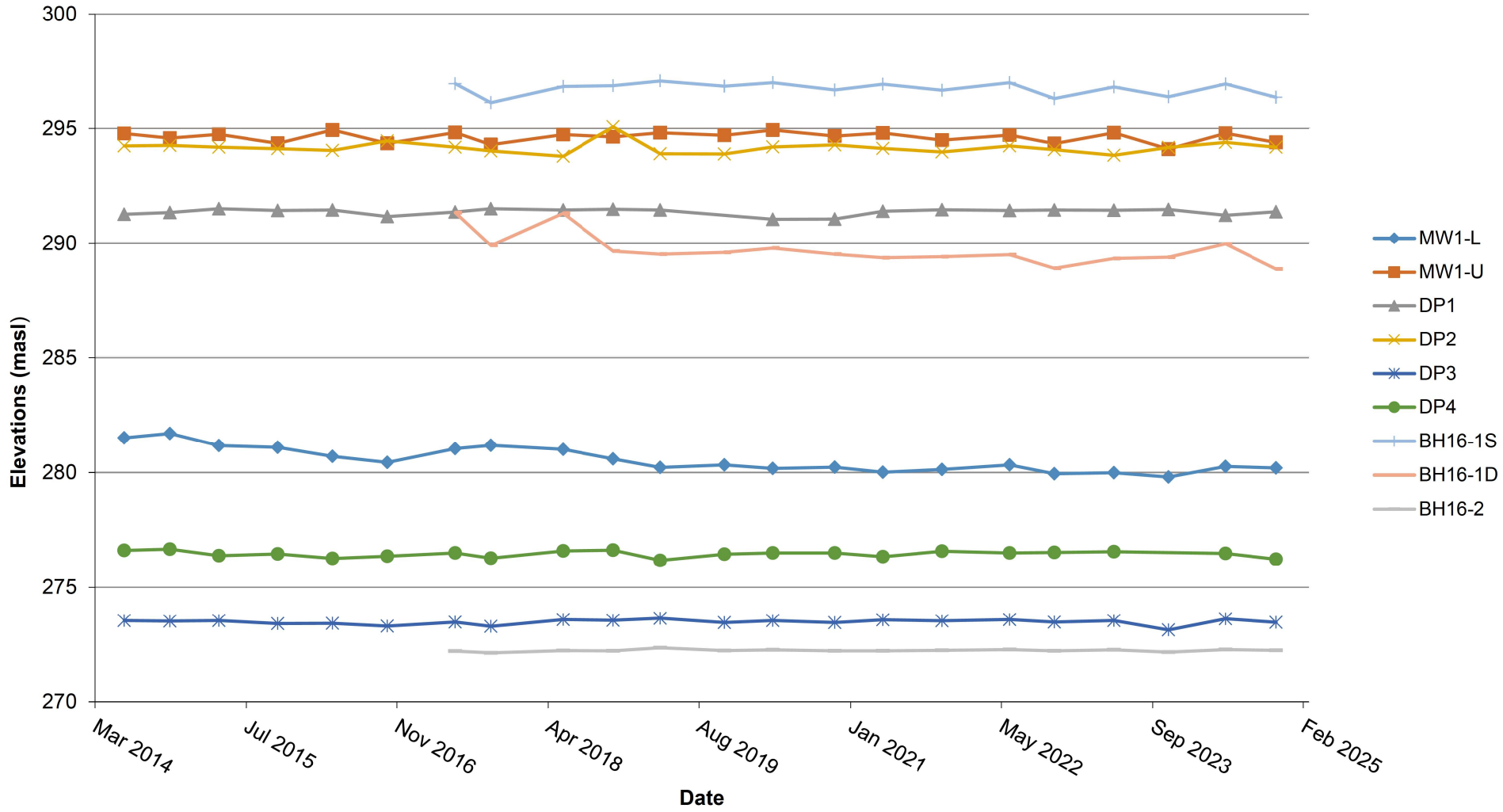

Groundwater Elevations

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**6**
Date:	1-Apr-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

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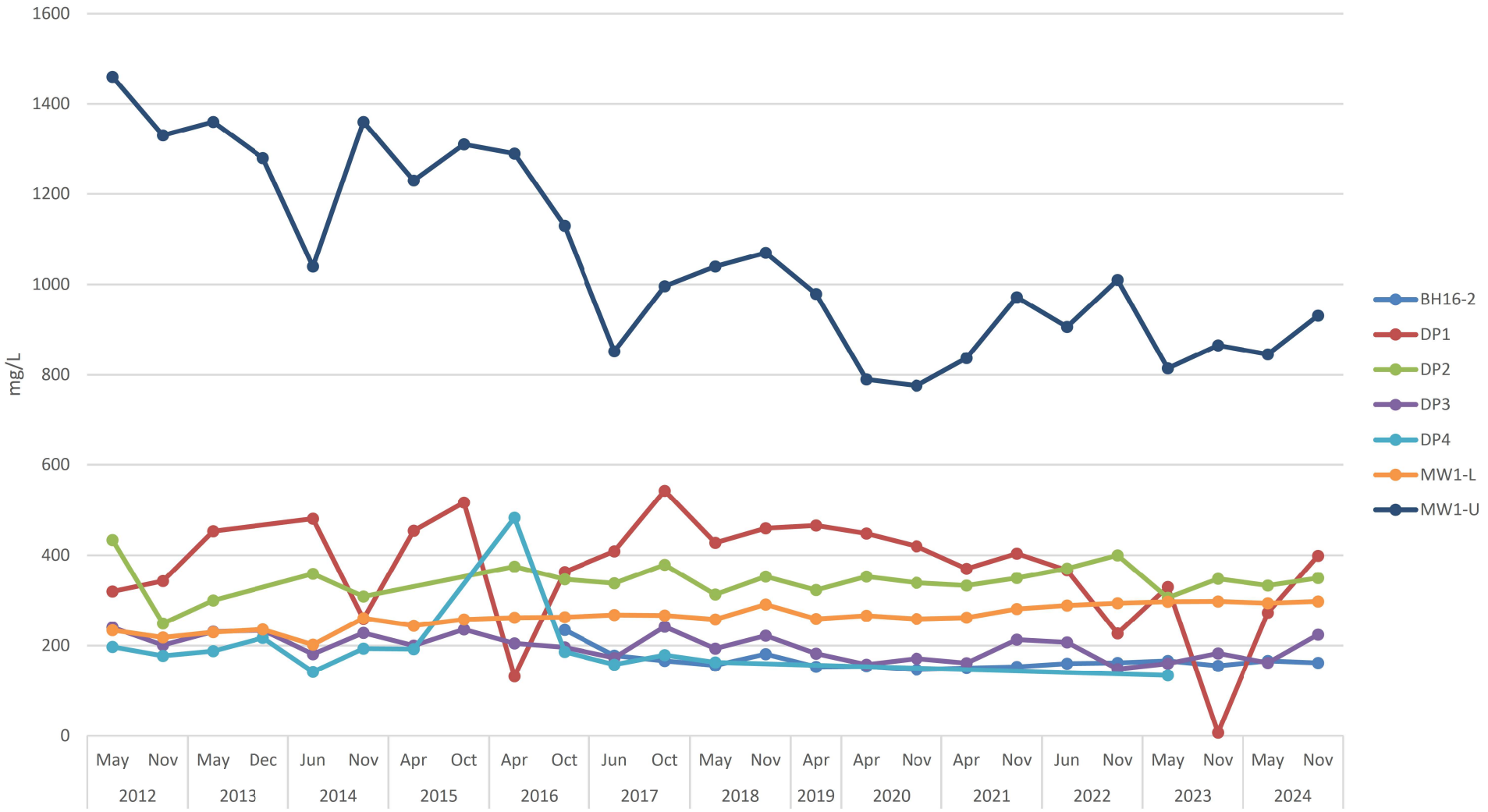
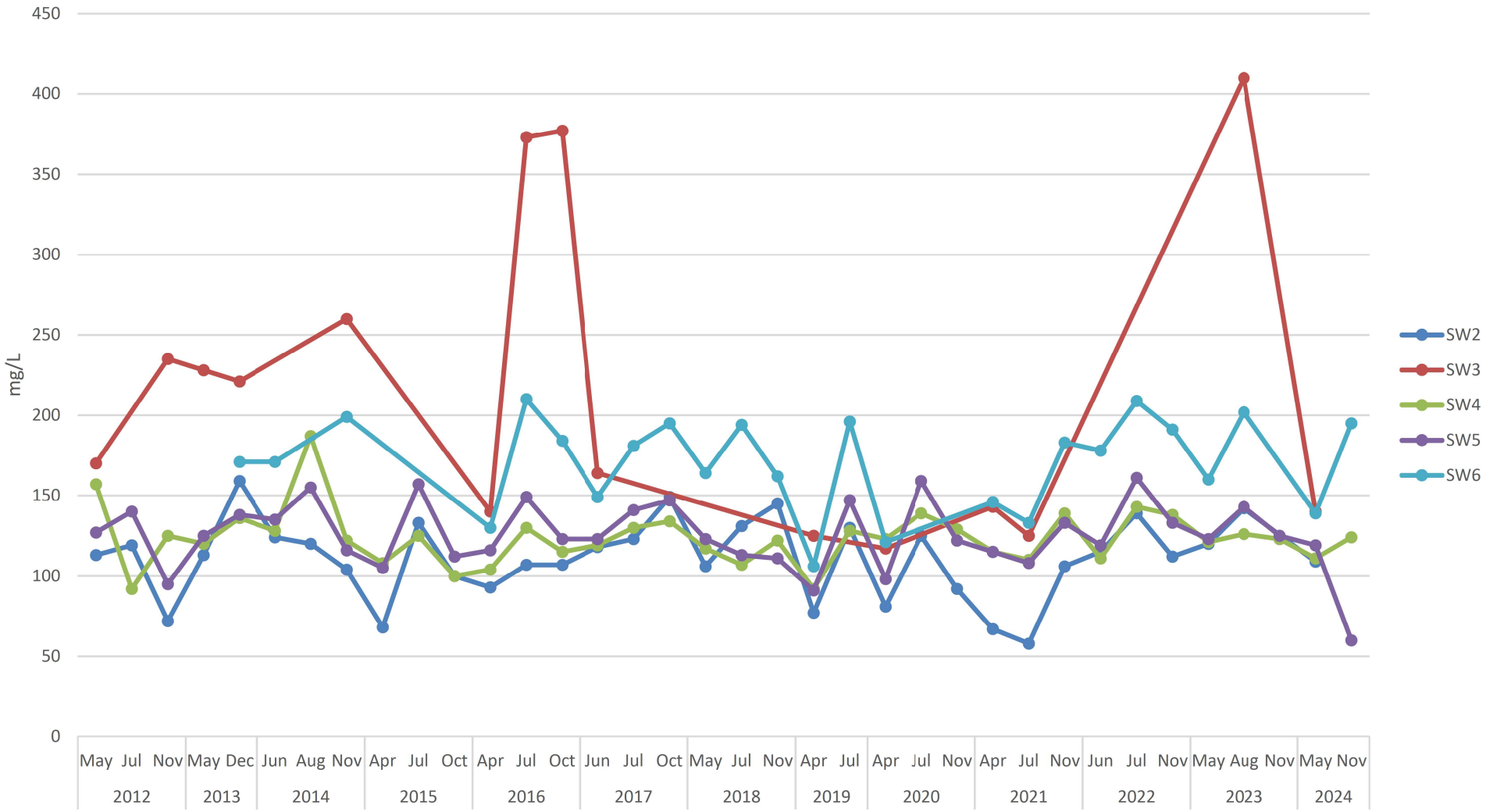


Alkalinity Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	7
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

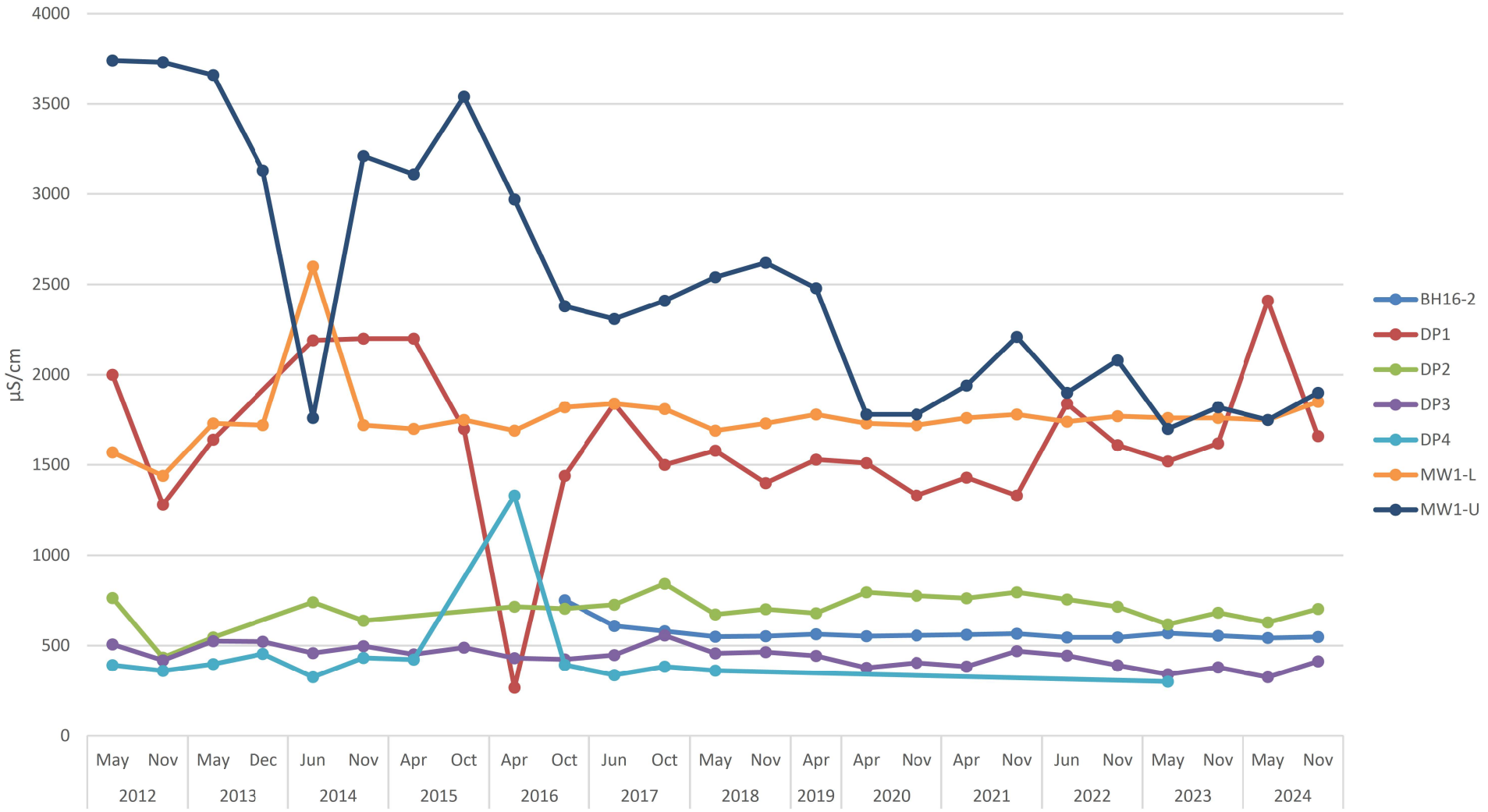


Alkalinity Concentrations - Surface Water

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**8**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

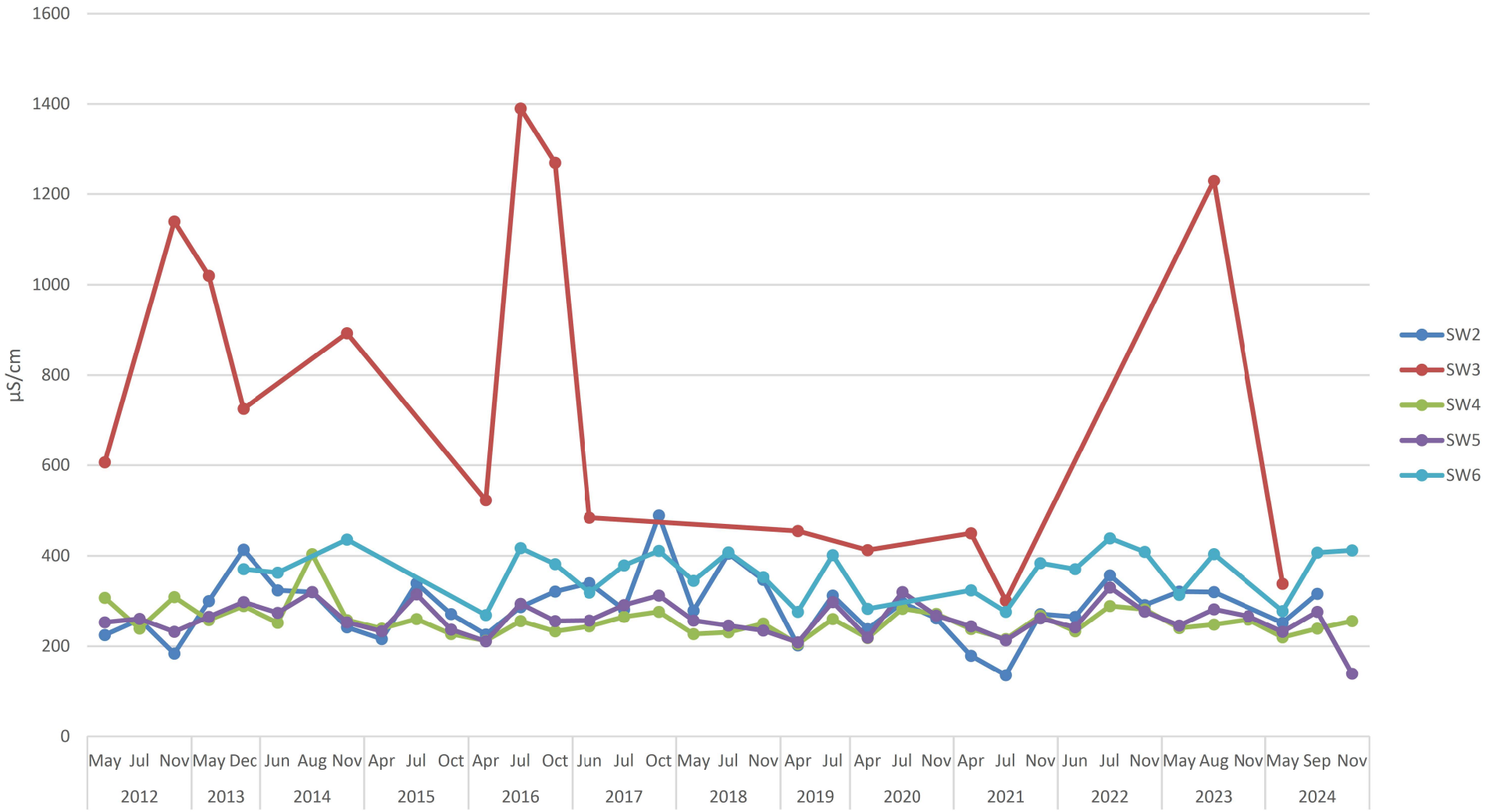


Conductivity Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**9**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM



Conductivity Concentrations - Surface Water

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**10**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

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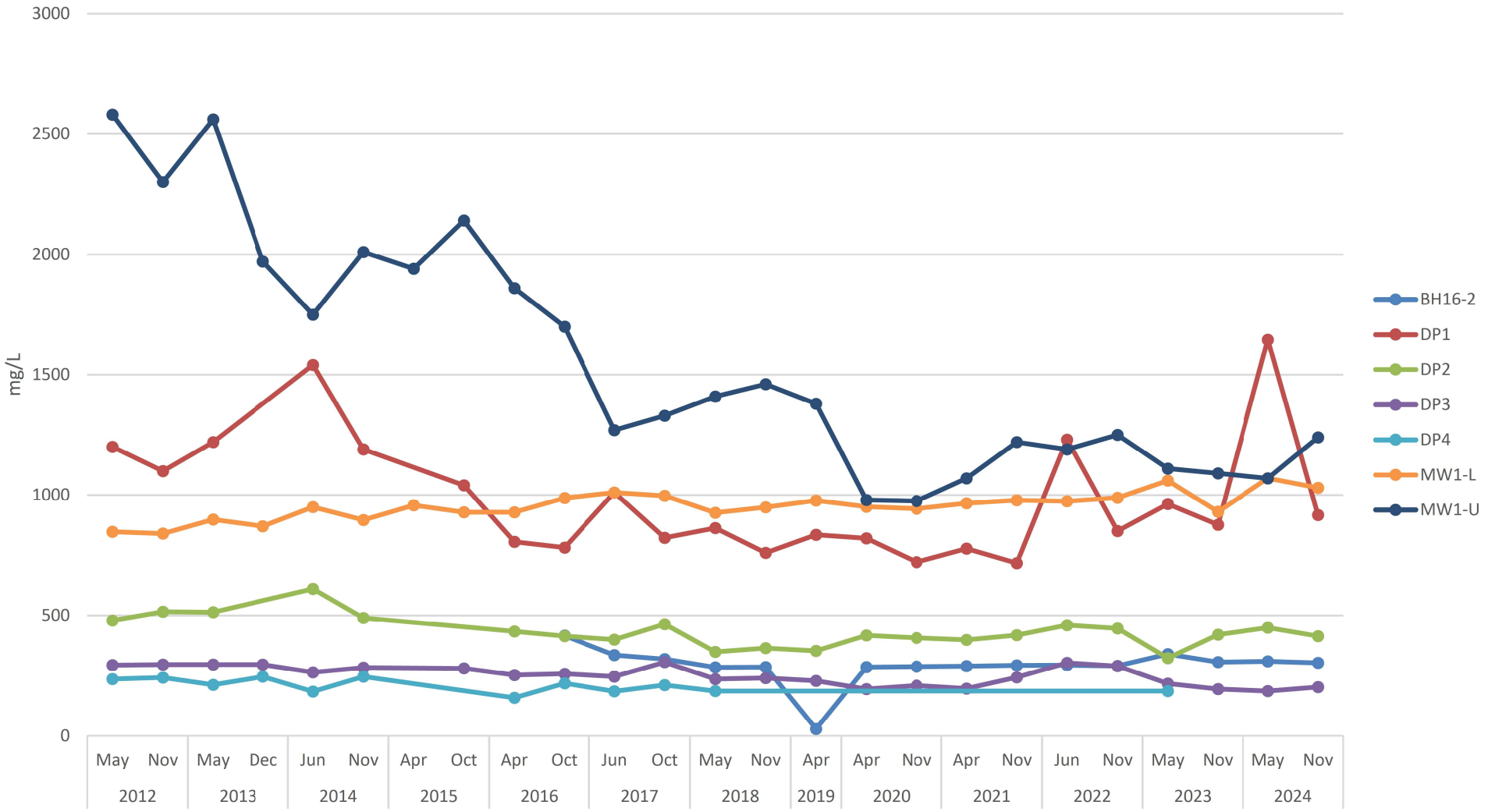
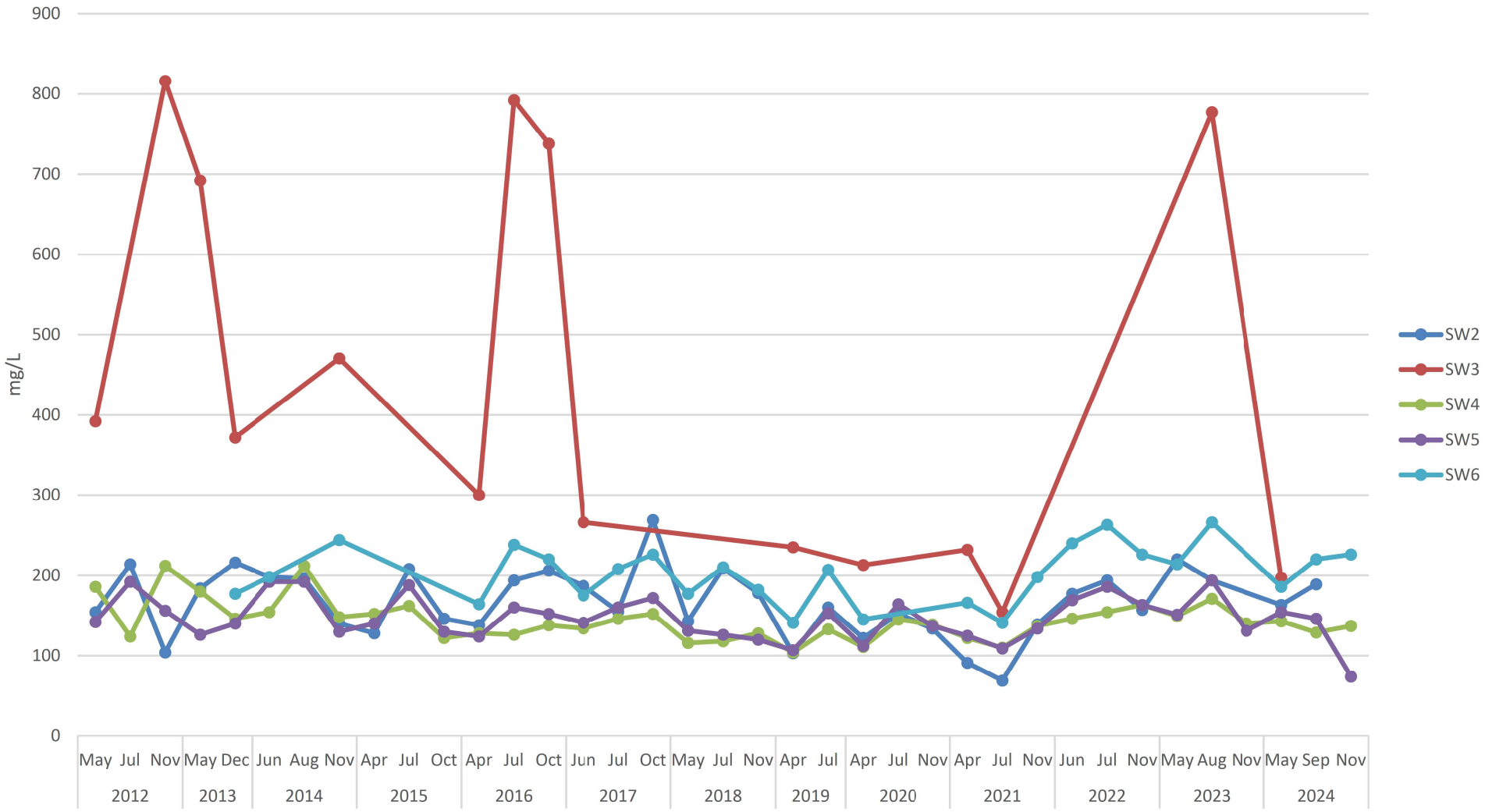


Total Dissolved Solids Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**11**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM



Total Dissolved Solids Concentrations - Surface Water

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**12**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

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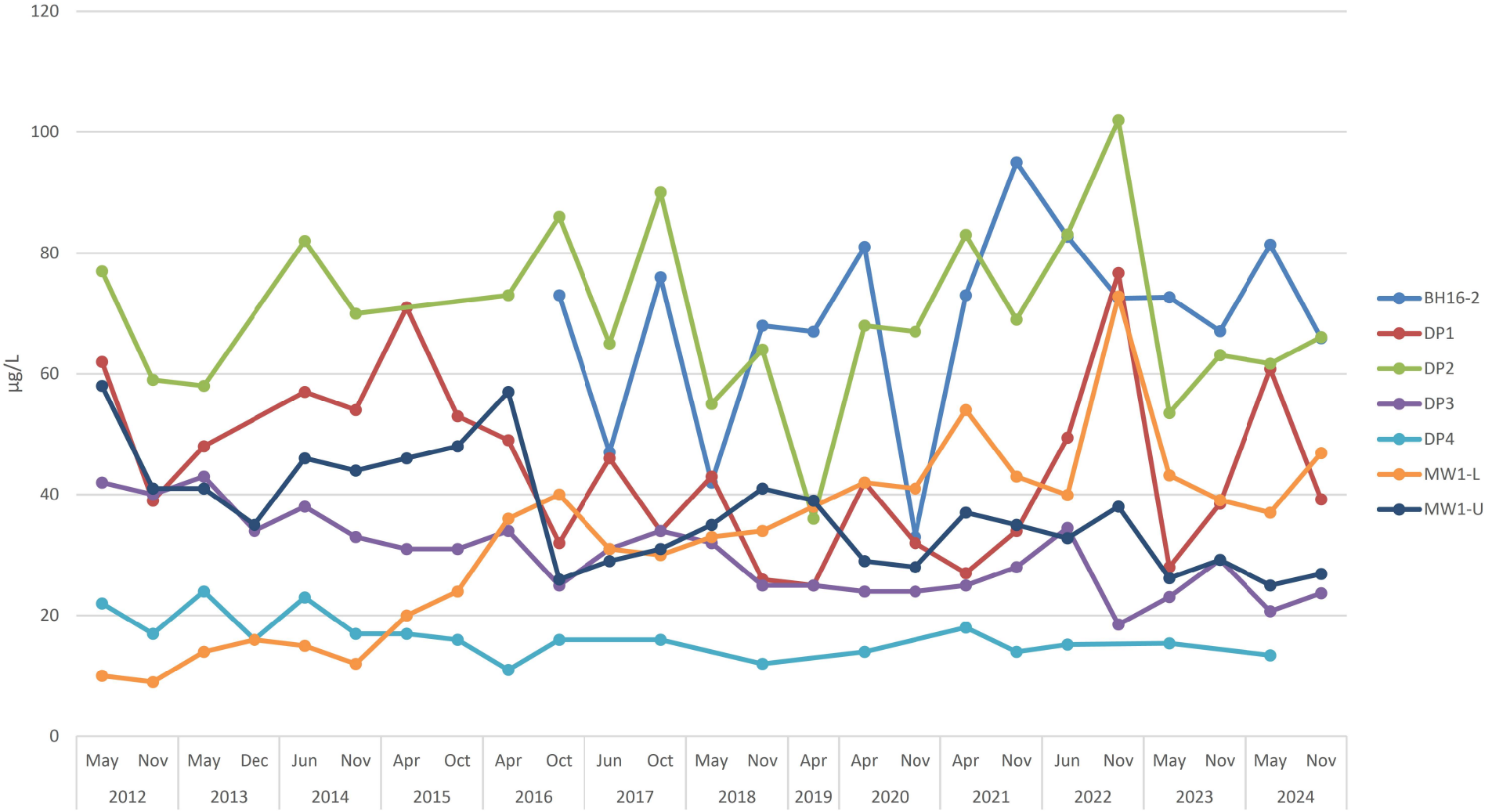
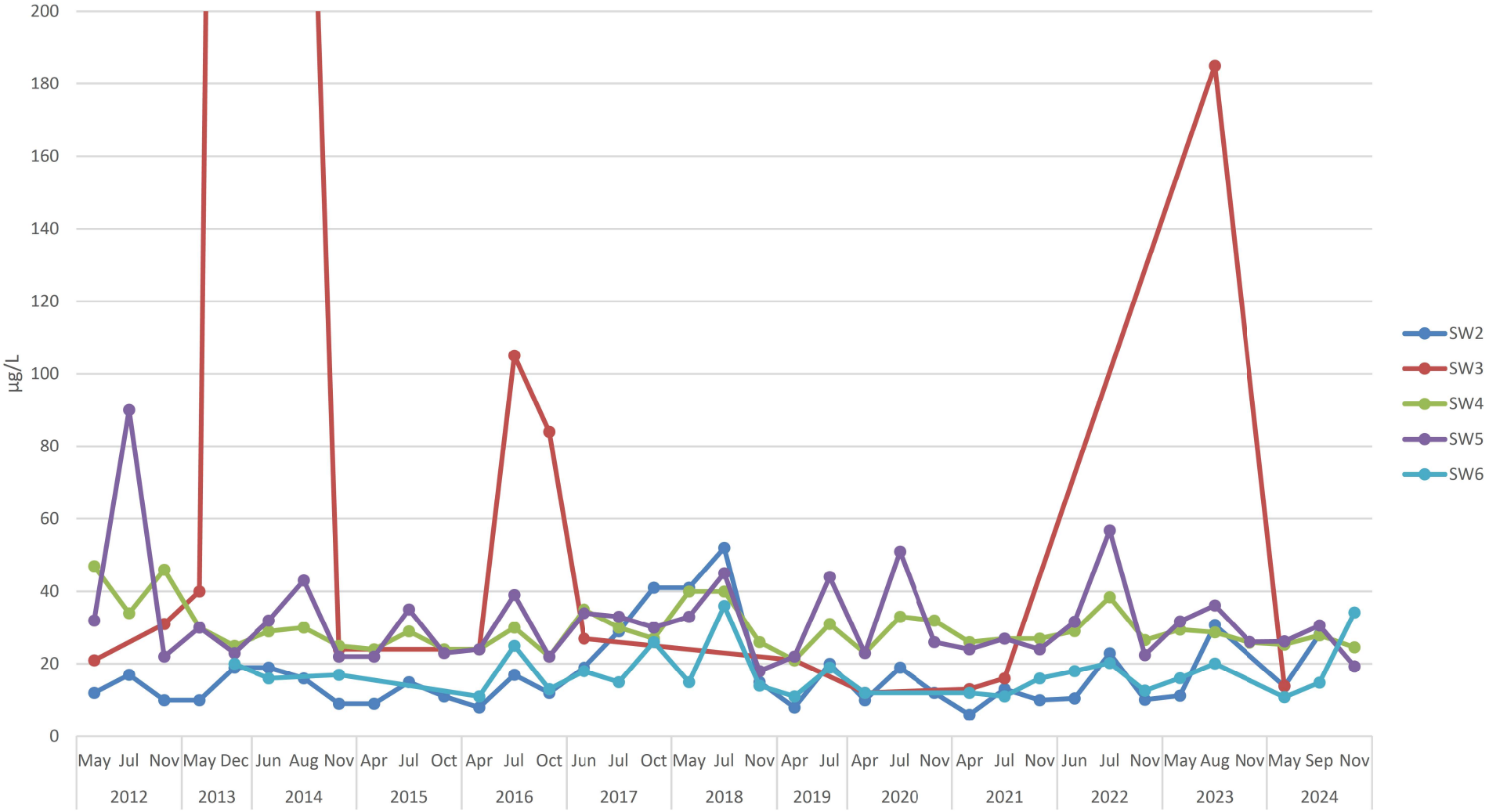


Barium Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**13**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

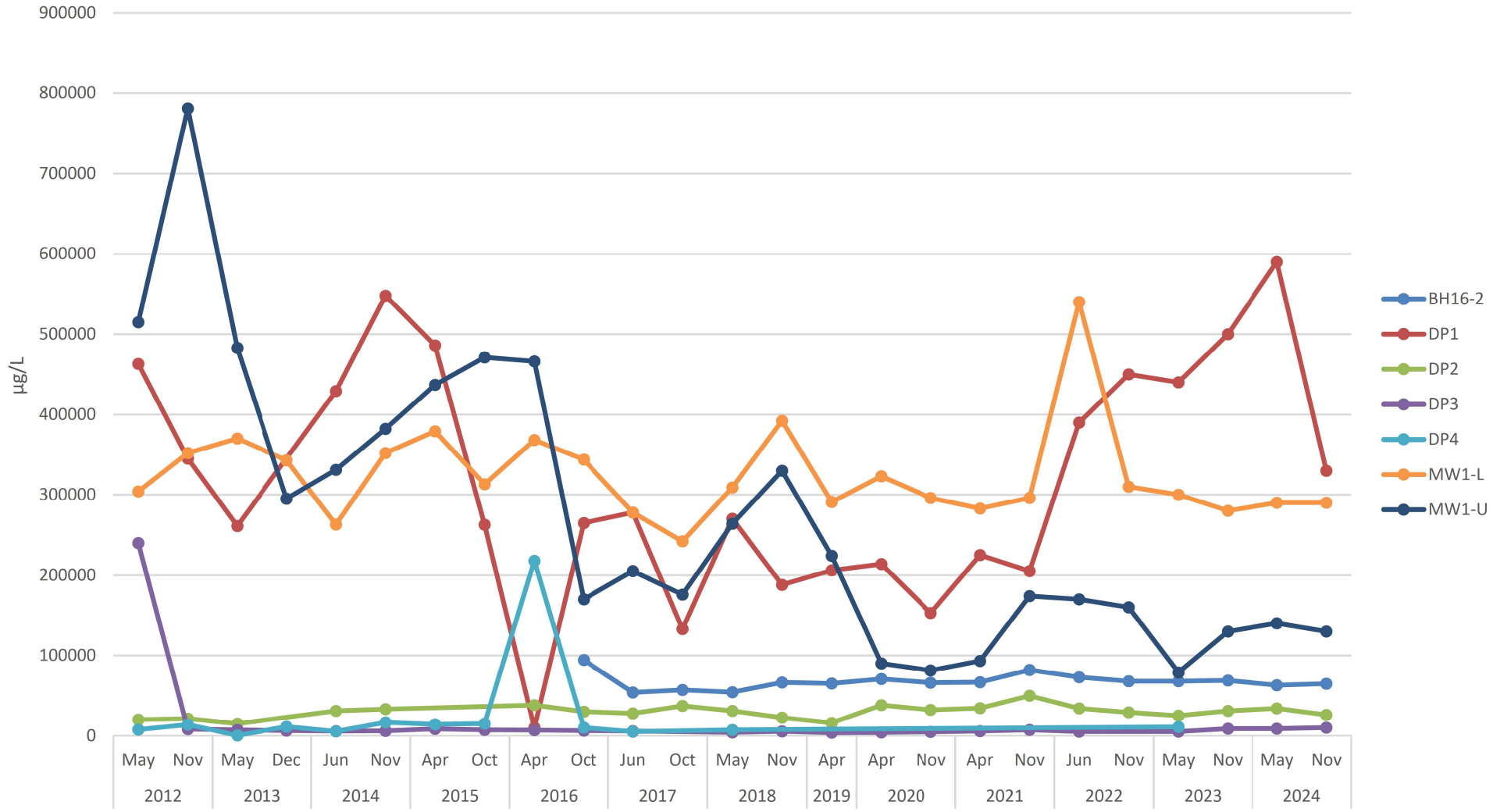


Barium Concentrations - Surface Water

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**14**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

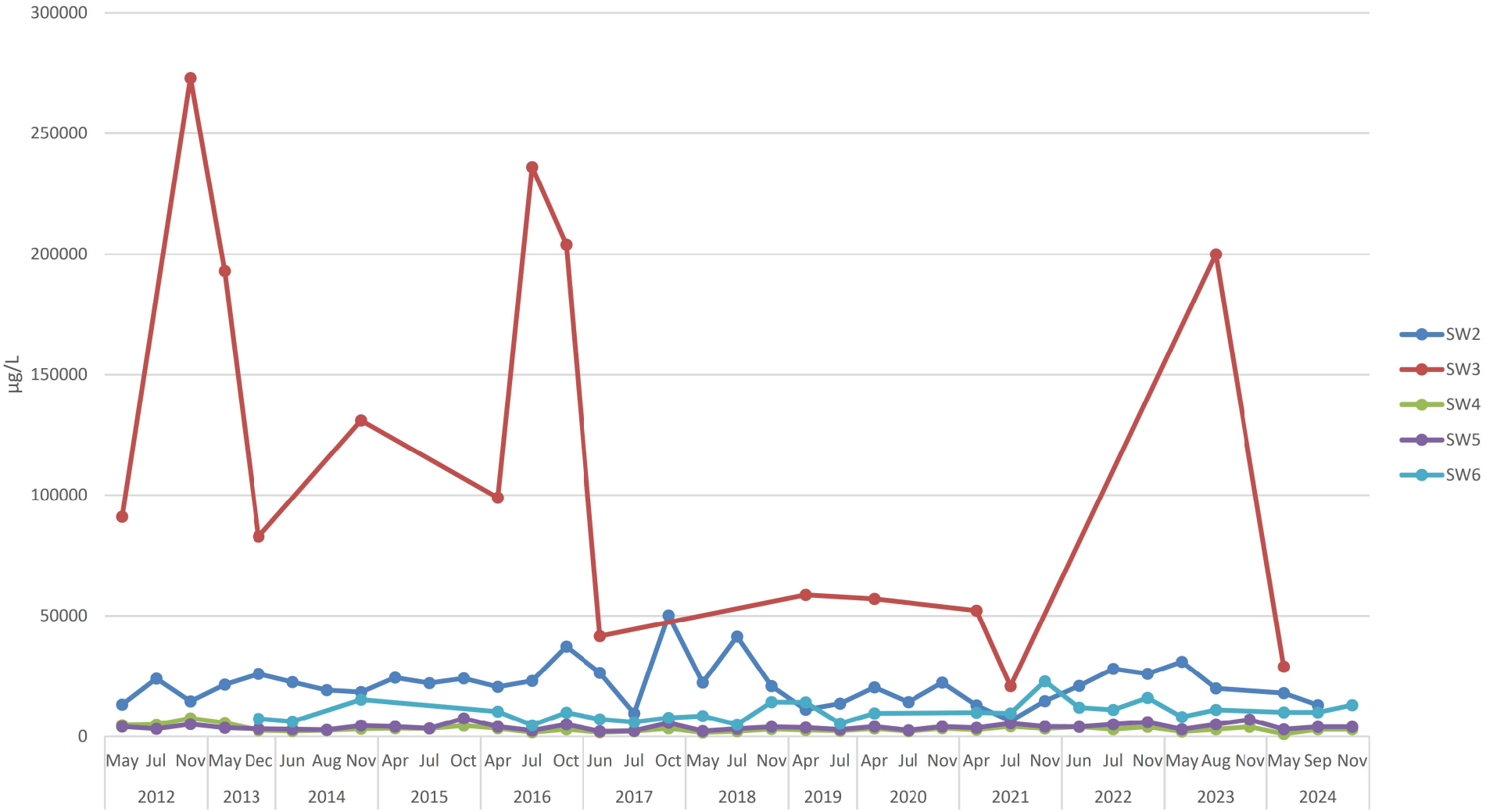


Chloride Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**15**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

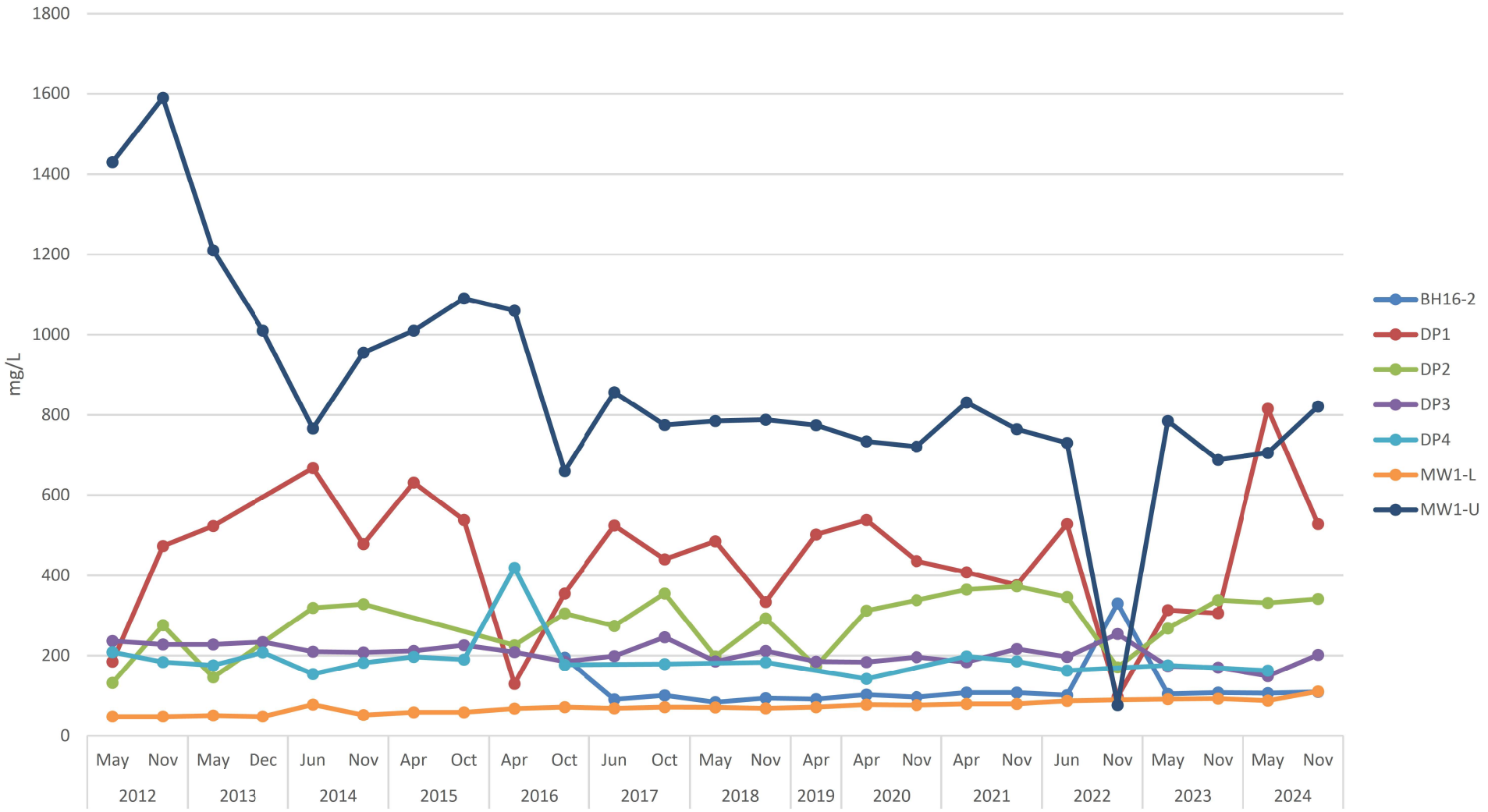


Chloride Concentrations - Surface Water

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**16**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

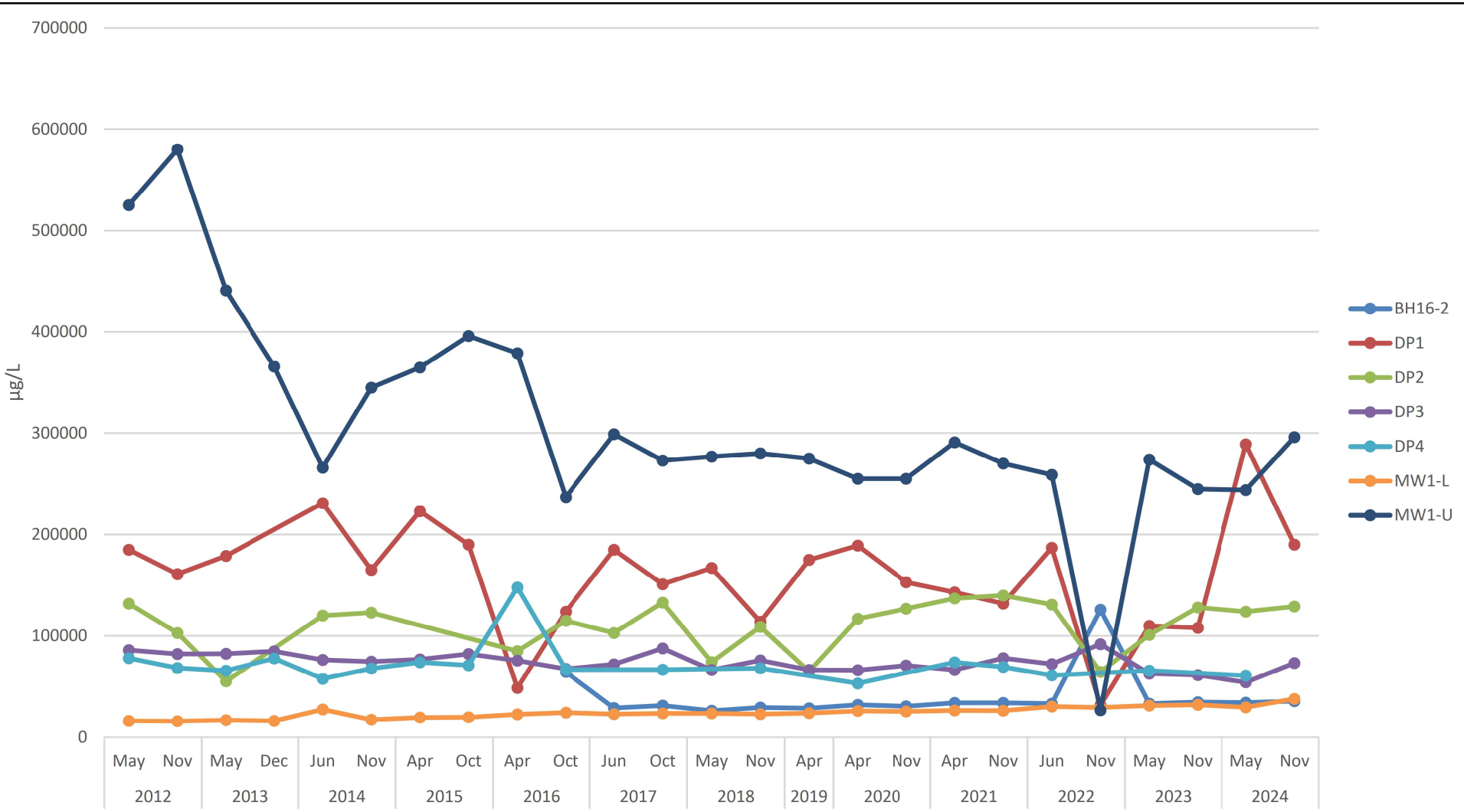


Hardness Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**17**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

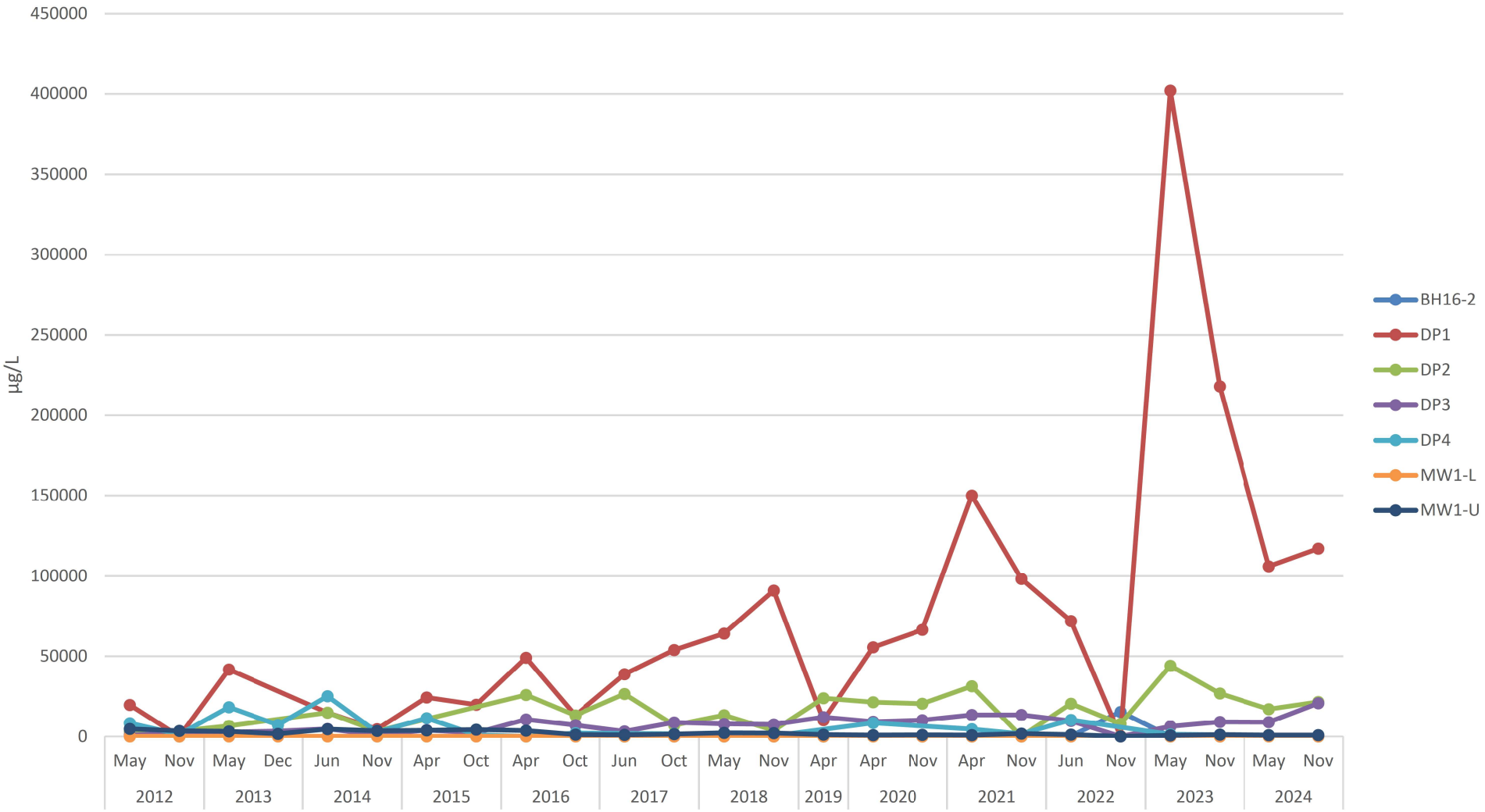


Calcium Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**18**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

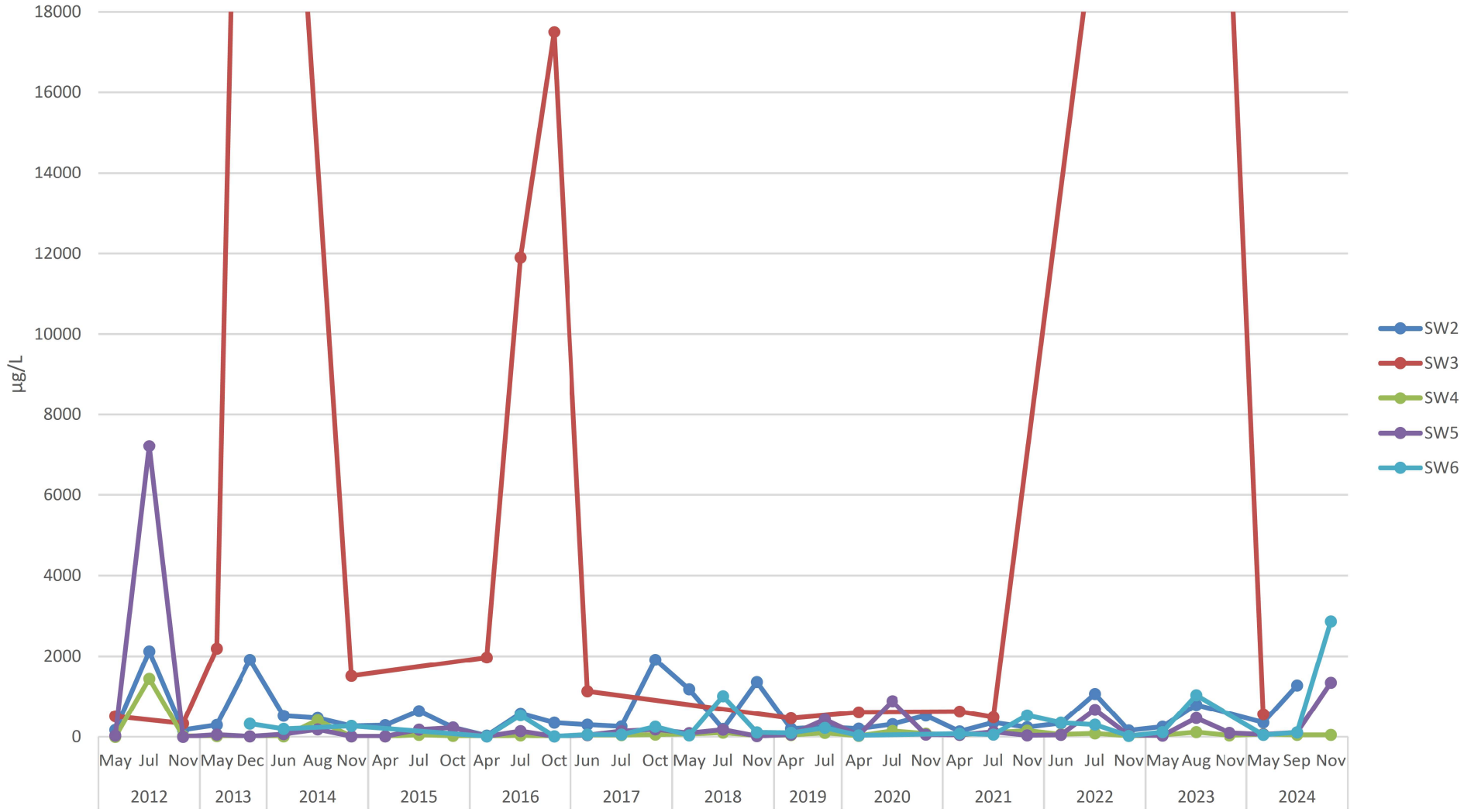


Iron Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**19**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

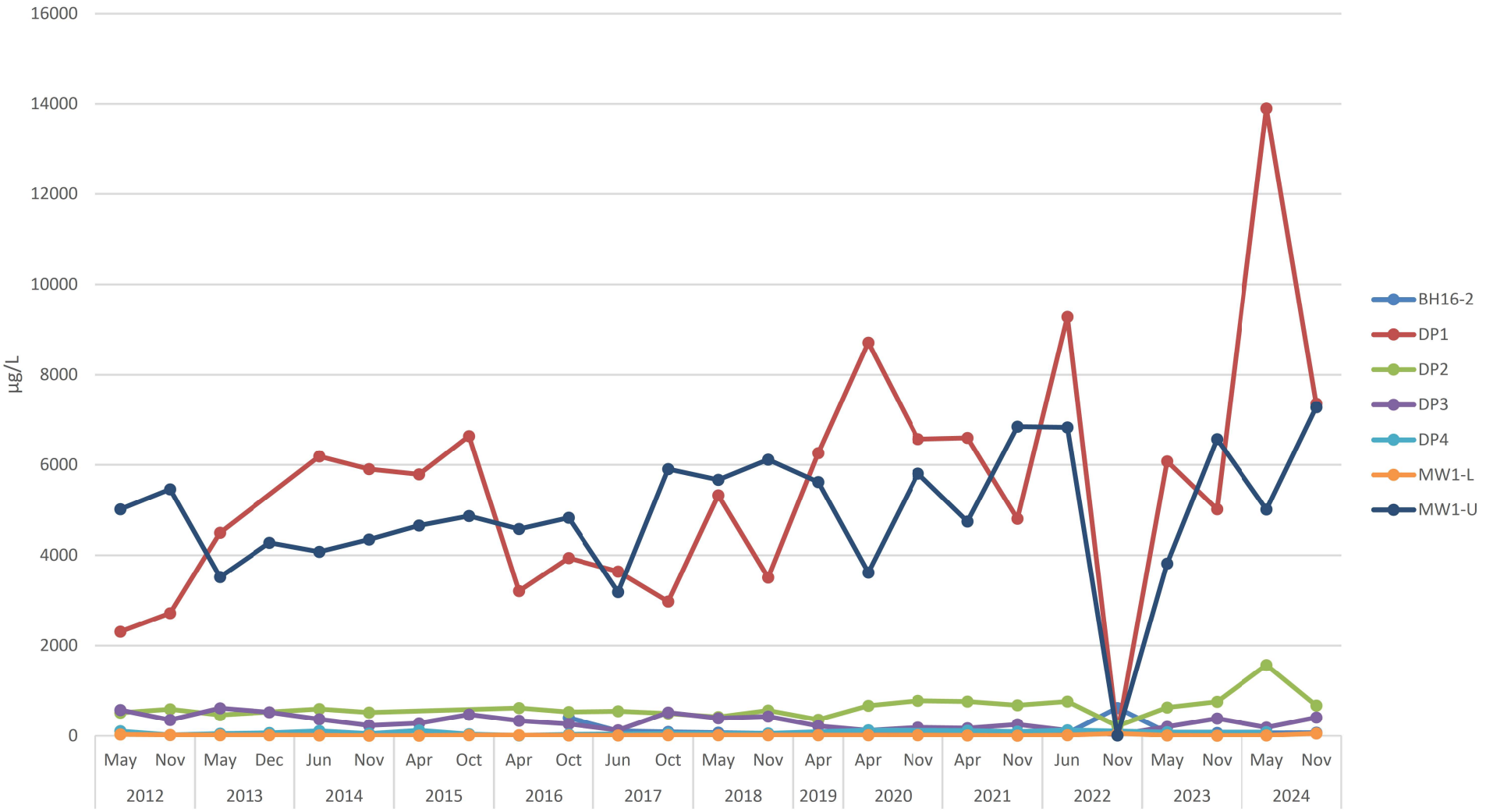


Iron Concentrations - Surface Water

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**20**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

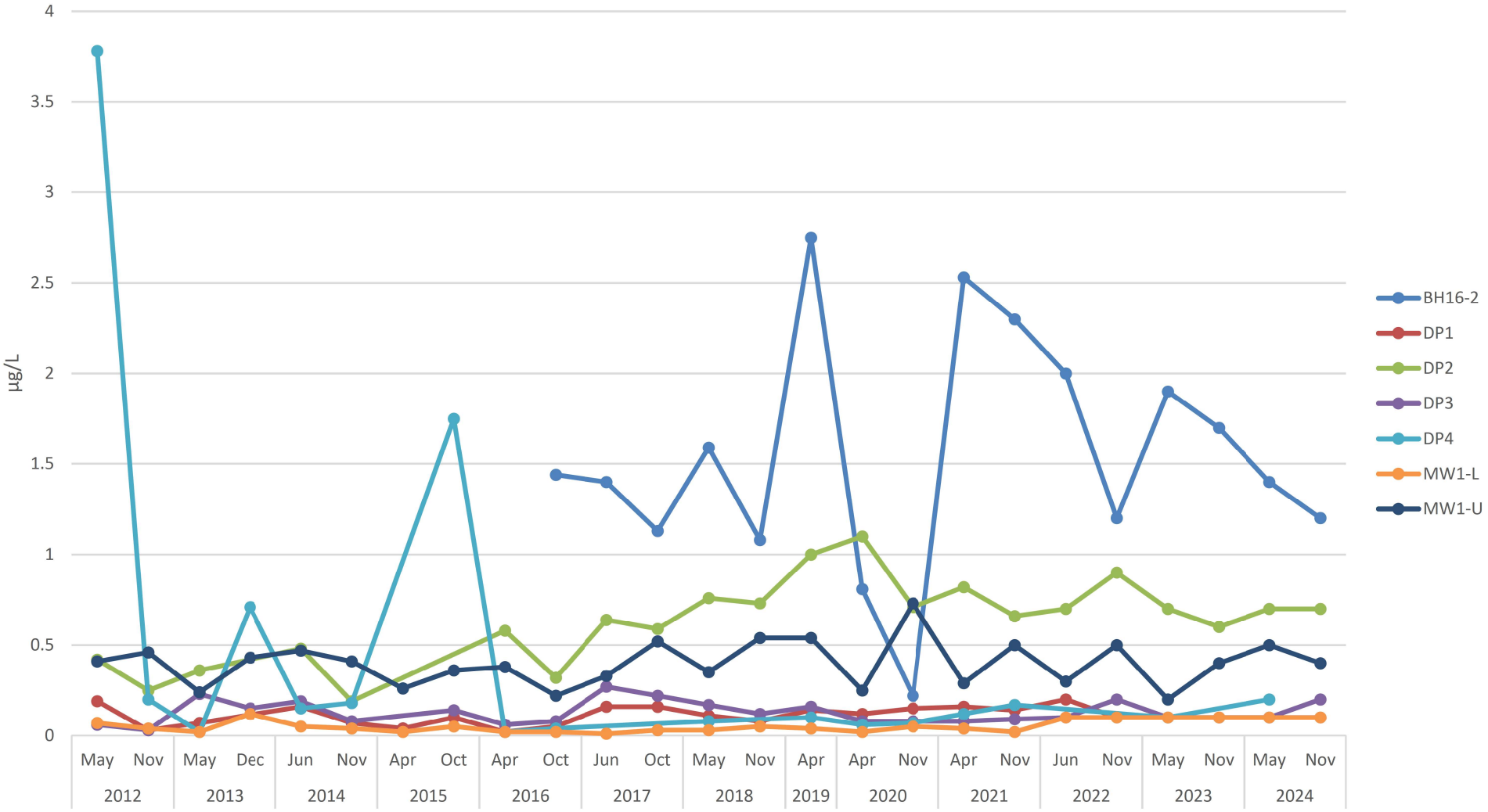


Manganese Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**21**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

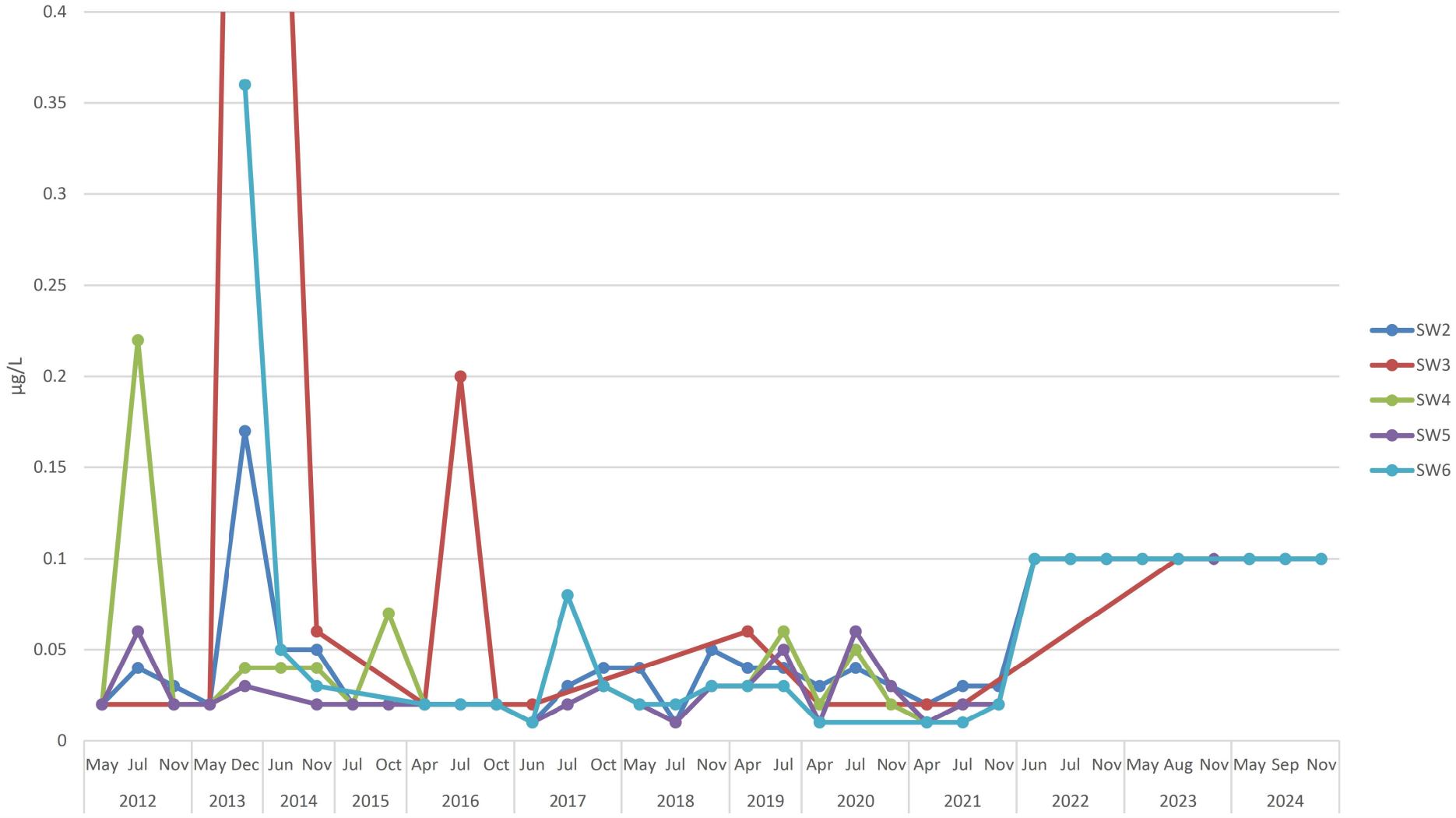


Ammonia Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**22**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

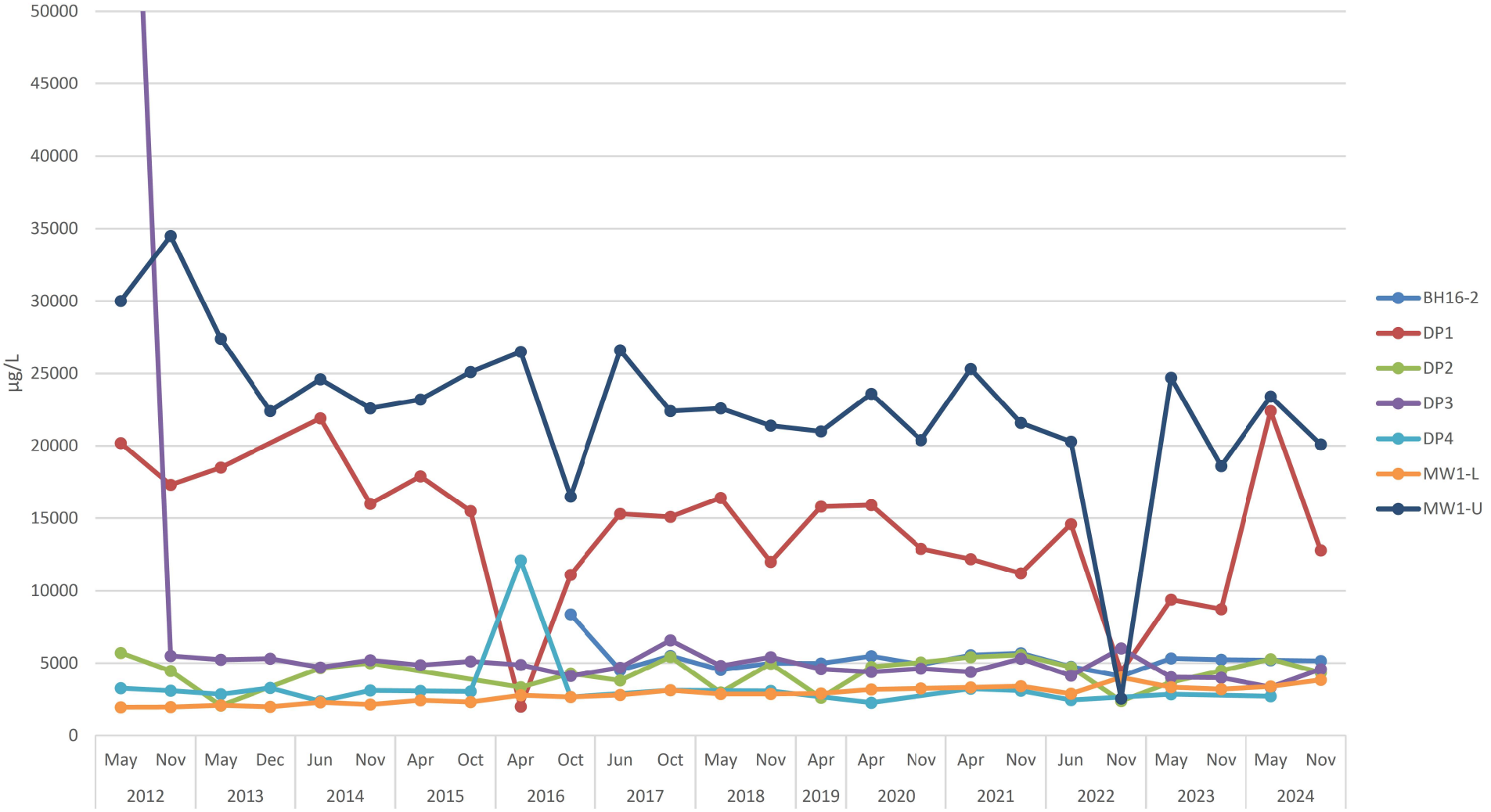


Ammonia Concentrations - Surface Water

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**23**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM



Magnesium Concentrations - Groundwater

2024 Annual Report, Crystal Lake Transfer Station
665 Crystal Lake Road, Trent Lakes
The Municipality of Trent Lakes

Figure:	**24**
Date:	21-Mar-25
Project Manager:	Stephanie Reeder
Project No.:	10520-003

CAMBIUM

Appended Tables

Table Notes

RDL - reported detection limit for the current year

RUC - Reasonable Use Criteria

ODWQS - Ontario Drinking Water Quality Standards, O.Reg. 169/03

PWQO - Water Management, Policies, Guidelines, Provincial Water Quality Objectives (MOEE, 1994b)

PWQO for beryllium, cadmium, copper, and lead depend on hardness

PWQO for aluminium depends on pH and background concentration

PWQO for chromium is 1 µg/L, taken from chromium VI. PWQO for chromium III is 8.9 µg/L

NV - No Value

"-" Parameter not analyzed or measured

Unionized ammonia calculated using total ammonia and field data for pH and temperature

Table 1 ***Environmental Monitoring Program***

Location	Task	Frequency	Parameters
GROUNDWATER			
MW1-U, MW1-L, DP1, DP2, DP3, DP4, BH16-1S, BH16-1D, BH16-2 1 QA/QC Duplicate	• Measure groundwater levels • Groundwater sampling • Field Measurements (pH, temperature, conductivity, dissolved oxygen, ORP)	Twice Annually (Spring and Autumn)	Alkalinity, Ammonia, Barium, Boron, Calcium, Chloride, Conductivity, Hardness, Iron, Magnesium, Manganese, Nitrate, TKN, pH, Potassium, Sodium, TDS, Sulphate, COD, DOC
MW1-U and MW1-L	• Groundwater sampling	Twice Annually (Spring and Autumn)	BOD, TSS
MW1-U and MW1-L 1 Trip Blank	• Groundwater sampling	Once Annually (Spring)	EPA 624 VOCs
All monitors	• Measure combustible gas % by volume methane	Twice Annually (Spring and Autumn)	Methane
SURFACE WATER			
SW2, SW3, SW4, SW5, SW6 1 QA/QC Duplicate	• Surface water sampling • Flow estimates • Field measurements (pH, temperature, conductivity, dissolved oxygen and ORP)	Three Times Annually (Spring, Summer, and Autumn)	Alkalinity, Ammonia, unionized ammonia (field), Arsenic, Barium, Boron, Cadmium, Chloride, Chromium, Cobalt, Conductivity, Copper, Iron, Lead, Nickel, Nitrate, Nitrite, TKN, pH, Total Phosphorus, Selenium, Silver, TSS, Turbidity, TDS, Sulphate, Zinc, BOD, COD, DOC, Phenols, Hardness, Colour **dissolved aluminum, dissolved mercury**

Dissolved mercury to be lab filtered with a 0.45 micron filter for all surface water samples
Dissolved aluminum to be lab filtered with a 0.2 micron filter (clay free) for all surface water samples
Lab to provided calculated unionized ammonia using provided pH and temperature

Table 2 - Groundwater Elevation Data

Monitor	Northing Easting[1]	Original Ground Elevation (masl)	Stick Up (m)	Depth (m)	Measuring Point (masl)	06-Jun-14	04-Nov-14	15-Apr-15	29-Oct-15	27-Apr-16	25-Oct-16	6-Jun-17	2-Oct-17	29-May-18	12-Nov-18
MW1-L	693024 4956700	300.41	0.95	22.47	301.36	281.51	281.7	281.17	281.09	280.7	280.44	281.043	281.183	281.003	280.593
MW1-U	693024 4956700	300.41	0.96	10.34	301.37	294.78	294.58	294.75	294.36	294-94	294.35	294.828	294.298	294.738	294.638
DP1	693017 4956600	291.49	0.99	2.62	292.48	291.49	291.51	291.48	291.43	291.45	291.17	291.37	291.51	291.45	291.49
DP2	693107 4956636	294.23	1.12	2.57	295.36	294.25	294.27	294.19	294.13	294.05	294.46	294.195	294.025	293.795	295.075
DP3	692929 4956741	273.68	0.72	1.70	274.40	273.54	273.52	273.54	273.41	273.42	273.3	273.47	273.29	273.58	273.55
DP4	692985 4956795	276.58	1.42	2.63	278.00	276.61	276.66	276.37	276.45	276.25	276.35	276.5	276.26	276.58	276.62
BH16-1S	693171 4956632	297.10	0.73	6.34	297.83	-	-	-	-	-	-	296.956	296.136	296.836	296.876
BH16-1D	693171 4956631	297.10	0.58	10.46	297.68	-	-	-	-	-	-	291.338	289.908	291.308	289.658
BH16-2	692609 4956431	273.14	0.89	8.08	274.03	-	-	-	-	-	-	272.218	272.138	272.238	272.228

1. Zone 17, accurate to +/- 5.0 metres

Shaded cells indicated wells constructed in bedrock.

Wells DP1, DP2, DP3, and DP4 were assumed to be constructed in overburden; no borehole logs are available.

Table 2 - Groundwater Elevation Data

Monitor	Northing Easting[1]	Original Ground Elevation (masl)	Stick Up (m)	Depth (m)	Measuring Point (masl)	16-Apr-19	14-Nov-19	21-Apr-20	12-Nov-20	19-Apr-21	3-Nov-21	14-Jun-22	9-Nov-22	25-May-23	21-Nov-23
MW1-L	693024 4956700	300.41	0.95	22.47	301.36	280.223	280.333	280.173	280.233	280.013	280.13	280.32	279.943	279.993	279.80
MW1-U	693024 4956700	300.41	0.96	10.34	301.37	294.818	294.708	294.938	294.668	294.808	294.50	294.72	294.348	294.818	294.11
DP1	693017 4956600	291.49	0.99	2.62	292.48	291.45	-	291.05	291.06	291.4	291.46	291.43	291.45	291.44	291.47
DP2	693107 4956636	294.23	1.12	2.57	295.36	293.905	293.895	294.205	294.285	294.135	293.99	294.25	294.085	293.835	294.19
DP3	692929 4956741	273.68	0.72	1.70	274.40	273.64	273.45	273.54	273.45	273.57	273.53	273.58	273.47	273.54	273.13
DP4	692985 4956795	276.58	1.42	2.63	278.00	276.17	276.44	276.49	276.49	276.33	276.57	276.5	276.52	276.55	-
BH16-1S	693171 4956632	297.10	0.73	6.34	297.83	297.076	296.846	297.006	296.686	296.936	296.676	297.006	296.316	296.816	296.40
BH16-1D	693171 4956631	297.10	0.58	10.46	297.68	289.528	289.598	289.788	289.528	289.368	289.418	289.508	288.918	289.338	289.40
BH16-2	692609 4956431	273.14	0.89	8.08	274.03	272.358	272.238	272.268	272.228	272.22	272.25	272.28	272.22	272.27	272.17

1. Zone 17, accurate to +/- 5.0 metres

Shaded cells indicated wells constructed in bedrock.

Wells DP1, DP2, DP3, and DP4 were assumed to be constructed in overburden; no borehole logs are available.

Table 2 - Groundwater Elevation Data

Monitor	Northing Easting[1]	Original Ground Elevation (masl)	Stick Up (m)	Depth (m)	Measuring Point (masl)	28-May-24	13-Nov-24
MW1-L	693024 4956700	300.41	0.95	22.47	301.36	280.26	280.19
MW1-U	693024 4956700	300.41	0.96	10.34	301.37	294.79	294.40
DP1	693017 4956600	291.49	0.99	2.62	292.48	291.22	291.38
DP2	693107 4956636	294.23	1.12	2.57	295.36	294.40	294.19
DP3	692929 4956741	273.68	0.72	1.70	274.40	273.61	273.46
DP4	692985 4956795	276.58	1.42	2.63	278.00	276.47	276.22
BH16-1S	693171 4956632	297.10	0.73	6.34	297.83	296.95	296.37
BH16-1D	693171 4956631	297.10	0.58	10.46	297.68	289.87	288.88
BH16-2	692609 4956431	273.14	0.89	8.08	274.03	272.28	272.25

1. Zone 17, accurate to +/- 5.0 metres

Shaded cells indicated wells constructed in bedrock.

Wells DP1, DP2, DP3, and DP4 were assumed to be constructed in overburden; no borehole logs are available.

Table 3 - Vertical Hydraulic Gradients

Monitor	Difference in Elevation of Bottom of Screen	Vertical Gradients Deep-Shallow: +downwards, -upwards																			Stratigraphy
		15-Apr-15	29-Oct-15	27-Apr-16	25-Oct-16	6-Jun-17	2-Oct-17	29-May-18	12-Nov-18	16-Apr-19	14-Nov-19	21-Apr-20	12-Nov-20	19-Apr-21	3-Nov-21	16-Jun-22	9-Nov-22	25-May-23	21-Nov-23	28-May-24	13-Nov-24	
BH16-1D	-4.27	-	-	-	-	1.32	1.46	1.30	1.69	0.03	1.70	1.69	1.68	1.77	1.70	1.76	1.73	1.75	1.64	1.66	1.75	Granite
BH16-1S																						Granite
MW1-L	-12.14	1.12	1.09	1.17	1.15	1.14	1.08	1.13	1.16	1.20	1.18	1.22	1.19	1.22	1.18	1.19	1.19	1.22	1.18	1.20	1.17	Granite
MW1-U																						Granite

Positive values indicate a downward vertical gradient.

Table 4 - Groundwater Quality

				Location Code	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1D	BH16-1S
				Date	16 Oct 2016	06 Jun 2017	02 Oct 2017	29 May 2018	12 Nov 2018	18 Apr 2019	21 Apr 2020	12 Nov 2020	19 Apr 2021	03 Nov 2021	16 Jun 2022	25 May 2023	21 Nov 2023	28 May 2024	29 Oct 2016
	Unit	EQL	***RUC***	**ODWQS**															
Barium (filtered)	µg/L	0.08	***261***	**1,000**	4	4	3	5	6	5	8	7	8	7	5.75	6.1	4.82	-	27
Boron (filtered)	µg/L	2		**5,000**	117	1,640	1,800	2,000	1,840	1,750	2,050	2,030	2,050	2,160	2,130	2,140	1,790	-	36
Calcium (filtered)	µg/L	10			22,500	13,200	10,500	16,400	30,800	32,000	72,800	47,100	55,400	51,900	54,400	65,500	55,800	-	60,700
Chloride	µg/L	500	***143,750***	**250,000**	54,100	42,800	44,800	36,300	57,900	-	41,200	36,400	37,500	45,400	43,000	38,000	35,000	45,000	33,600
Iron (filtered)	µg/L	5	***157***	**300**	<10	<5	11	17	<5	6	***1,970***	11	***346***	45	42	26	62	-	<10
Magnesium (filtered)	µg/L	1			3,930	1,530	1,970	3,290	5,730	6,000	5,890	5,500	5,490	5,190	4,180	4,580	3,780	-	5,160
Manganese (filtered)	µg/L	0.01	***33***	**50**	2	9	4	11	16	11	***49***	21	25	18	12.2	14.6	9.20	-	***83***
Potassium (filtered)	µg/L	9			17,900	12,100	13,900	14,400	18,400	15,900	15,200	14,600	15,300	14,900	13,100	14,300	12,600	-	7,490
Sodium (filtered)	µg/L	10		**200,000**	56,000	138,000	154,000	171,000	200,000	149,000	150,000	133,000	131,000	137,000	125,000	121,000	112,000	-	24,700
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	132	143	175	204	274	-	253	232	229	243	248	186	222	-	188
Total Dissolved Solids	mg/L	3	***409***	**500**	234	393	***427***	400	***556***	-	***441***	***437***	***439***	***451***	***497***	369	***494***	-	276
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	72.4	39	34	55	101	105	206	140	161	151	153	182	155	-	173
Chemical Oxygen Demand	mg/L	5			10	433	98	257	232	475	990	274	212	63	12	<8	19	10	8
Total Suspended Solids	mg/L	2			203,000	-	-	-	-	-	-	-	-	-	-	14,100	-	-	1,480
Biochemical Oxygen Demand	mg/L	2			<5	-	-	-	-	-	-	-	-	-	-	-	-	-	<5
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	5	**29.4**	**24.6**	**45.3**	**26.6**	**19.7**	**10.8**	**5.1**	**6.5**	**5.4**	4	3	3	**6**	3
Sulphate	mg/L	1		**500**	-	-	-	-	-	-	-	-	-	-	-	-	-	81	-
Sulphate (filtered)	mg/L	1		**500**	28.7	89	92	18	166	-	110	121	126	161	140	140	140	-	17.8
Ammonia as N	mg/L	0.01			<0.02	0.07	0.04	0.07	0.07	0.11	0.05	0.11	0.06	0.02	<0.1	<0.1	<0.1	<0.1	<0.02
Nitrate (as N)	mg/L	0.05		**10**	<0.05	<0.05	<0.05	<0.05	<0.05	-	0.08	<0.05	<0.05	<0.05	<0.06	<0.06	<0.06	-	<0.05
Nitrite (as N)	mg/L	0.03		**1**	-	-	-	-	-	-	-	-	-	-	-	<0.03	<0.03	-	-
Total Kjeldahl Nitrogen	mg/L	0.1			0.19	0.4	0.3	0.7	0.4	0.7	1.1	0.2	0.9	0.2	<0.5	<0.5	<0.5	0.8	0.21
Electrical Conductivity (Lab)	µS/cm	1			472	715	776	765	1,040	-	836	830	833	855	840	752	811	-	482
pH (Lab)	-	0.05		**6.5-8.5**	8.11	**8.67**	8.5	8.4	8.03	-	8.09	8.04	8.15	8.05	8.06	8.27	8.08	-	8.16
DO (Field)	mg/L				8.1	11.57	8.53	10.25	8.61	4.94	10.91	10.42	9.02	12.02	8.32	-	11.16	11.11	8.1
Redox (Field)	mV				-	50	114	57	170	190	112	190	176	77	340	-204	254	194	-
Temperature (Field)	°C				8.3	9.3	13.6	13	7.4	9	7.3	6.1	7.8	4.2	17	16.2	4.2	13.8	8.3
Conductivity (field)	µS/cm				400	690	720	690	1,010	910	910	562	768	751	330	813	803	829	436
pH (Field)	-			**6.5-8.5**	**9.2**	**8.69**	**8.65**	8.27	8.09	8.01	8.04	7.6	7.8	7.79	7.62	7.31	7.3	8.08	**9.2**

Table 4 - Groundwater Quality

				Location Code	BH16-1S	BH16-1S	BH16-1S	BH16-1S	BH16-1S	BH16-1S	BH16-1S	BH16-1S	BH16-1S	BH16-1S	BH16-1S	BH16-1S	BH16-1S	BH16-1S
				Date	06 Jun 2017	02 Oct 2017	29 May 2018	12 Nov 2018	18 Apr 2019	21 Apr 2020	12 Nov 2020	19 Apr 2021	03 Nov 2021	16 Jun 2022	09 Nov 2022	25 May 2023	21 Nov 2023	28 May 2024	13 Nov 2024
	Unit	EQL	***RUC***	**ODWQS**															
Barium (filtered)	µg/L	0.08	***261***	**1,000**	31	35	24	24	19	22	20	25	20	17.4	31.9	15.2	14.7	12.2	15.5
Boron (filtered)	µg/L	2		**5,000**	55	46	50	39	33	34	32	34	31	58	264	33	32	22	32
Calcium (filtered)	µg/L	10			65,300	73,600	65,200	73,800	74,000	84,900	85,800	88,300	89,900	88,300	96,100	90,700	87,400	84,200	91,100
Chloride	µg/L	500	***143,750***	**250,000**	26,500	36,500	36,200	41,600	23,400	30,500	32,800	32,200	70,500	66,000	64,000	37,000	42,000	35,000	35,000
Iron (filtered)	µg/L	5	***157***	**300**	<5	9	40	6	<5	33	18	***283***	8	<7	***237,000***	13	15	<7	144
Magnesium (filtered)	µg/L	1			6,840	7,960	7,130	7,640	6,740	7,180	6,770	7,370	7,450	6,160	7,520	6,570	5,840	4,830	6,070
Manganese (filtered)	µg/L	0.01	***33***	**50**	***145***	***173***	***115***	***65***	***45***	***40***	16	21	9	8.67	***4,210***	10.1	1.36	2.98	6.76
Potassium (filtered)	µg/L	9			6,200	6,800	5,900	6,300	5,800	6,300	6,000	6,400	6,400	5,900	3,310	6,220	5,930	5,360	6,610
Sodium (filtered)	µg/L	10		**200,000**	32,200	24,600	25,600	24,900	18,600	19,500	19,600	20,100	23,400	20,000	64,200	19,800	19,000	14,300	17,900
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	194	197	188	197	198	199	190	197	201	195	198	204	222	196	205
Total Dissolved Solids	mg/L	3	***409***	**500**	285	294	261	276	269	278	281	279	317	***431***	349	326	280	300	263
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	191	217	192	216	213	242	242	251	255	246	271	253	242	230	252
Chemical Oxygen Demand	mg/L	5			190	33	71	28	19	12	13	10	7	10	<8	<8	19	<8	<8
Total Suspended Solids	mg/L	2			-	-	-	-	-	-	-	-	-	-	-	302	-	-	-
Biochemical Oxygen Demand	mg/L	2			-	-	-	-	-	-	-	-	-	-	-	<4	-	-	-
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	5	**12.6**	**10.4**	3.4	3.8	**5.3**	2	4.1	2.7	3	2	2	2	2	2
Sulphate	mg/L	1		**500**	-	-	-	-	-	-	-	-	-	-	-	-	-	18	26
Sulphate (filtered)	mg/L	1		**500**	15	14	18	19	20	27	27	21	26	25	28	27	26	-	-
Ammonia as N	mg/L	0.01			0.02	0.03	0.05	0.05	0.04	0.02	0.07	0.01	0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate (as N)	mg/L	0.05		**10**	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	0.08	<0.06	<0.06	0.06	0.07	<0.06	<0.06
Nitrite (as N)	mg/L	0.03		**1**	-	-	-	-	-	-	-	-	-	-	-	<0.03	<0.03	<0.03	<0.03
Total Kjeldahl Nitrogen	mg/L	0.1			0.8	0.3	0.6	0.3	0.3	0.2	0.2	0.2	0.2	<0.5	<0.5	<0.5	<0.5	0.6	<0.5
Electrical Conductivity (Lab)	µS/cm	1			519	534	505	533	520	536	543	539	610	614	634	531	558	467	510
pH (Lab)	-	0.05		**6.5-8.5**	8.12	8.16	8.16	8.1	8.11	7.92	7.92	7.98	7.61	7.91	8.09	8.17	8.08	8.31	7.74
DO (Field)	mg/L				12.69	7.79	7.44	4.92	9.07	10.01	5.78	10.6	10.99	7.59	9.5	7.73	10.46	11.96	9.82
Redox (Field)	mV				44	82	84	150	159	88	253	179	165	315	246	-203	259	196	78
Temperature (Field)	°C				9.4	11.8	11.9	8.7	7	4.8	9	7	8.4	15.5	6.4	18.2	4.3	10.9	7.2
Conductivity (field)	µS/cm				550	900	430	570	530	600	409	512	646	155	490	529	677	550	265
pH (Field)	-			**6.5-8.5**	7.91	7.86	7.64	7.67	7.8	7.58	7.68	7.68	7.64	7.45	7.14	7.11	6.91	7.85	7.54

Table 4 - Groundwater Quality

				Location Code	BH16-2	BH16-2	BH16-2	BH16-2	BH16-2	BH16-2	BH16-2	BH16-2	BH16-2	BH16-2	BH16-2	BH16-2	BH16-2	BH16-2
				Date	29 Oct 2016	06 Jun 2017	02 Oct 2017	29 May 2018	12 Nov 2018	18 Apr 2019	21 Apr 2020	12 Nov 2020	19 Apr 2021	03 Nov 2021	16 Jun 2022	09 Nov 2022	25 May 2023	21 Nov 2023	28 May 2024
	Unit	EQL	*RUC*	**ODWQS**															
Barium (filtered)	µg/L	0.08	***261***	**1,000**	73	47	76	42	68	67	81	33	73	95	82.7	72.5	72.7	67.1	81.4
Boron (filtered)	µg/L	2		**5,000**	214	273	267	258	258	257	274	276	271	268	309	15	263	215	227
Calcium (filtered)	µg/L	10			64,400	28,800	31,300	26,200	29,500	28,600	32,100	30,600	34,100	33,900	33,200	126,000	33,300	34,800	34,200
Chloride	µg/L	500	***143,750***	**250,000**	94,400	54,000	57,100	54,200	66,500	65,100	70,700	66,200	66,600	81,900	73,000	68,000	68,000	69,000	63,000
Iron (filtered)	µg/L	5	***157***	**300**	***232***	6	25	21	7	<5	***422***	16	96	<5	***205***	***15,400***	29	114	***768***
Magnesium (filtered)	µg/L	1			8,380	4,520	5,510	4,540	5,010	4,980	5,490	4,900	5,550	5,690	4,760	4,100	5,340	5,240	5,210
Manganese (filtered)	µg/L	0.01	***33***	**50**	***401***	***107***	***85***	***70***	***53***	***65***	***87***	***46***	***76***	***49***	***56.2***	***619***	***72.5***	***64.0***	***64.9***
Potassium (filtered)	µg/L	9			3,440	1,700	2,000	1,700	2,100	1,900	2,000	1,600	2,100	2,200	2,530	1,590	2,000	2,230	2,620
Sodium (filtered)	µg/L	10		**200,000**	73,200	92,800	85,500	84,200	84,600	79,200	83,200	84,600	82,100	81,000	76,700	9,050	81,600	70,200	76,100
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	235	178	166	156	181	153	154	147	150	153	160	162	166	155	166
Total Dissolved Solids	mg/L	3	***409***	**500**	***416***	335	319	285	286	29	286	288	290	293	294	291	340	306	309
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	195	91	101	84	94	92	103	97	108	108	102	330	105	108	107
Chemical Oxygen Demand	mg/L	5			47	<5	760	1,050	944	7,400	1,740	183	4,000	1,340	28	11	37	63	12
Total Suspended Solids	mg/L	2			171,000	-	-	-	-	-	-	-	-	-	-	-	150,000	-	-
Biochemical Oxygen Demand	mg/L	2			9	-	-	-	-	-	-	-	-	-	-	-	12	-	-
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	**7**	4.6	3.4	**6.7**	2.4	2.9	2.5	1.2	3.2	2	4	3	2	2	3
Sulphate	mg/L	1		**500**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
Sulphate (filtered)	mg/L	1		**500**	15.4	16	17	102	19	19	20	22	21	25	23	22	23	26	-
Ammonia as N	mg/L	0.01			1.44	1.4	1.13	1.59	1.08	2.75	0.81	0.22	2.53	2.3	2.0	1.2	1.9	1.7	1.4
Nitrate (as N)	mg/L	0.05		**10**	<0.25	0.28	0.09	<0.05	0.05	0.22	0.12	0.17	0.19	0.21	0.18	0.31	0.17	<0.6	<0.06
Nitrite (as N)	mg/L	0.03		**1**	-	-	-	-	-	-	-	-	-	-	-	-	0.12	<0.3	<0.03
Total Kjeldahl Nitrogen	mg/L	0.1			2.03	5.4	4.9	27.8	4.1	13.1	4.1	0.4	117	54.1	2.8	1.0	1.4	2.2	1.7
Electrical Conductivity (Lab)	µS/cm	1			752	609	580	549	552	563	552	556	560	566	545	545	569	555	542
pH (Lab)	-	0.05		**6.5-8.5**	8.17	8.48	**8.64**	8.44	8.45	8.32	8.46	8.49	**8.67**	8.17	8.46	**8.56**	8.26	8.40	**8.54**
DO (Field)	mg/L				6.5	5.68	6.59	6.46	8.12	6.23	3.26	3.74	5.37	3.34	5.06	2.17	2.84	2.39	4.7
Redox (Field)	mV				-	51	179	95	162	177	80	255	239	158	241	195	-	243	62
Temperature (Field)	°C				8.2	10	9.4	10	7.9	8	6.1	7.8	7.2	8.8	11.4	6.2	9.3	6.5	10.7
Conductivity (field)	µS/cm				-	610	570	440	580	550	620	396	571	501	78	425	566	441	582
pH (Field)	-			**6.5-8.5**	**9.8**	8.08	**8.61**	8.47	7.93	8.34	**8.59**	8.34	8.36	8.22	7.71	8.35	7.76	**6.47**	**8.64**

Table 4 - Groundwater Quality

				Location Code	BH16-2	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1
				Date	13 Nov 2024	01 May 2012	13 Nov 2012	31 May 2013	10 Jun 2014	04 Nov 2014	16 Apr 2015	29 Oct 2015	29 Apr 2016	29 Oct 2016	06 Jun 2017	02 Oct 2017	29 May 2018	12 Nov 2018	18 Apr 2019
	Unit	EQL	*RUC*	**ODWQS**															
Barium (filtered)	µg/L	0.08	***261***	**1,000**	65.9	62	39	48	57	54	71	53	49	32	46	34	43	26	25
Boron (filtered)	µg/L	2		**5,000**	258	328	286	334	287	247	193	311	293	334	308	434	427	404	305
Calcium (filtered)	µg/L	10			35,600	185,000	161,000	179,000	231,000	165,000	223,000	190,000	48,700	124,000	185,000	151,000	167,000	114,000	175,000
Chloride	µg/L	500	***143,750***	**250,000**	65,000	***463,000***	***345,000***	***261,000***	***429,000***	***548,000***	***486,000***	***262,600***	10,200	***265,000***	***278,000***	133,000	***270,000***	***188,000***	***206,000***
Iron (filtered)	µg/L	5	***157***	**300**	46	***19,700***	65	***41,800***	***14,900***	***4,570***	***24,400***	***19,900***	***49,000***	***13,200***	***38,800***	***53,900***	***64,100***	***90,900***	***10,200***
Magnesium (filtered)	µg/L	1			5,150	20,200	17,300	18,500	21,900	16,000	17,900	15,500	2,010	11,100	15,300	15,100	16,400	12,000	15,800
Manganese (filtered)	µg/L	0.01	***33***	**50**	***69.3***	***2,310***	***2,720***	***4,500***	***6,190***	***5,910***	***5,790***	***6,640***	***3,210***	***3,940***	***3,640***	***2,980***	***5,330***	***3,510***	***6,260***
Potassium (filtered)	µg/L	9			2,090	5,680	6,920	6,910	8,760	6,330	6,840	8,140	2,730	5,380	5,900	6,900	6,300	5,400	7,100
Sodium (filtered)	µg/L	10		**200,000**	78,500	106,000	131,000	116,000	169,000	163,000	177,000	176,000	5,780	135,000	130,000	135,000	88,100	104,000	107,000
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	162	320	343	***453***	***481***	259	***454***	***517***	132	***363***	***409***	***543***	***428***	***460***	***466***
Total Dissolved Solids	mg/L	3	***409***	**500**	303	***1,200***	***1,100***	***1,220***	***1,540***	***1,190***	-	***1,040***	***806***	***782***	***1,010***	***823***	***863***	***761***	***835***
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	110	185	***473***	***523***	***667***	***478***	***631***	***538***	130	***355***	***524***	***440***	***485***	334	***502***
Chemical Oxygen Demand	mg/L	5			12	39	50	54	52	46	32	115	37	32	75	111	76	42	67
Total Suspended Solids	mg/L	2			-	236	282	144	192	326	-	-	288	142	-	-	-	-	-
Biochemical Oxygen Demand	mg/L	2			-	<5	<5	<5	<5	<5	-	-	<5	<5	-	-	-	-	-
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	3	**9.5**	**7.9**	**15.8**	**8.4**	**8.4**	**7**	**28.2**	**11**	**10.2**	**5.5**	**7**	4.3	4.7	**5.9**
Sulphate	mg/L	1		**500**	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		**500**	-	17.9	14.4	19	33.6	22.3	27.6	25.5	5.57	14.3	15	35	24	14	17
Ammonia as N	mg/L	0.01			1.2	0.19	0.03	0.07	0.16	0.07	0.04	0.1	0.02	0.05	0.16	0.16	0.11	0.08	0.14
Nitrate (as N)	mg/L	0.05		**10**	<0.06	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.25	<0.05	<0.25	<0.05	<0.05	0.06	<0.05	0.07
Nitrite (as N)	mg/L	0.03		**1**	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.1			1.4	0.79	0.53	1.7	0.75	0.48	0.45	1.14	0.57	0.57	0.9	0.8	0.6	0.5	0.8
Electrical Conductivity (Lab)	µS/cm	1			548	2,000	1,280	1,640	2,190	2,200	2,200	1,700	267	1,440	1,840	1,500	1,580	1,400	1,530
pH (Lab)	-	0.05		**6.5-8.5**	8.16	7.38	7.96	7.25	7.6	7.45	7.72	7.89	8.06	7.83	7.52	8.17	7.72	7.43	7.75
DO (Field)	mg/L				10.34	-	-	-	-	-	-	-	7.2	-	7.07	8.87	8.33	6.84	6.44
Redox (Field)	mV				64	-	-	-	-	-	-	-	-	-	58	78	66	154	173
Temperature (Field)	°C				6.6	-	-	-	-	-	-	-	7.6	-	10.9	12.5	13.8	7.2	7
Conductivity (field)	µS/cm				270	-	-	-	-	-	-	-	1,891	-	1,580	1,490	1,230	1,320	1,480
pH (Field)	-			**6.5-8.5**	7.53	-	-	-	-	-	-	-	**10.1**	-	7.06	7.22	7.06	6.74	6.96

Table 4 - Groundwater Quality

				Location Code	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP2	DP2	DP2	DP2	DP2
				Date	21 Apr 2020	12 Nov 2020	19 Apr 2021	03 Nov 2021	16 Jun 2022	09 Nov 2022	25 May 2023	21 Nov 2023	28 May 2024	13 Nov 2024	01 May 2012	13 Nov 2012	31 May 2013	10 Jun 2014	04 Nov 2014
	Unit	EQL	*RUC*	ODWQS															
Barium (filtered)	µg/L	0.08	***261***	**1,000**	42	32	27	34	49.4	76.7	28.0	38.5	60.8	39.2	77	59	58	82	70
Boron (filtered)	µg/L	2		**5,000**	405	494	479	413	370	209	373	250	278	308	<10	18	12	12	<10
Calcium (filtered)	µg/L	10			189,000	153,000	143,000	132,000	187,000	31,800	110,000	108,000	289,000	190,000	132,000	103,000	55,200	120,000	123,000
Chloride	µg/L	500	***143,750***	**250,000**	***214,000***	***153,000***	***225,000***	***205,000***	***390,000***	***450,000***	***440,000***	***500,000***	***590,000***	***330,000***	20,100	21,200	15,000	31,000	33,200
Iron (filtered)	µg/L	5	***157***	**300**	***55,600***	***66,500***	***150,000***	***98,200***	***72,000***	***164***	***402,000***	***218,000***	***106,000***	***117,000***	***3,250***	***3,290***	***6,610***	***14,900***	***3,420***
Magnesium (filtered)	µg/L	1			15,900	12,900	12,200	11,200	14,600	4,400	9,400	8,740	22,400	12,800	5,720	4,470	2,080	4,660	5,000
Manganese (filtered)	µg/L	0.01	***33***	**50**	***8,710***	***6,570***	***6,600***	***4,810***	***9,280***	***52.1***	***6,080***	***5,020***	***13,900***	***7,360***	***514***	***590***	***461***	***596***	***517***
Potassium (filtered)	µg/L	9			6,900	6,200	5,200	5,300	6,560	2,030	3,500	3,810	8,070	6,660	1,820	1,420	1,940	1,480	1,440
Sodium (filtered)	µg/L	10		**200,000**	93,300	92,000	75,200	98,300	105,000	60,700	61,300	71,400	160,000	145,000	6,980	6,820	4,100	6,290	7,310
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	***448***	***420***	***370***	***404***	***367***	227	330	7	273	***399***	***434***	249	300	***359***	309
Total Dissolved Solids	mg/L	3	***409***	**500**	***821***	***722***	***778***	***718***	***1,230***	***851***	***963***	***877***	***1,646***	***917***	***480***	***516***	***514***	***610***	***490***
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	***538***	***436***	***408***	***376***	***528***	97.5	313	306	***815***	***528***	132	276	146	319	328
Chemical Oxygen Demand	mg/L	5			103	33	97	57	38	42	84	84	31	25	51	56	39	116	54
Total Suspended Solids	mg/L	2			-	-	-	-	-	-	370	-	-	-	450	69	512	567	656
Biochemical Oxygen Demand	mg/L	2			-	-	-	-	-	-	<4	-	-	-	<5	<5	<5	<5	<5
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	**5.2**	3	4.1	3.1	5	5	5	4	**6**	4	**15.5**	**11**	**13.1**	3.7	**11.6**
Sulphate	mg/L	1		**500**	-	-	-	-	-	-	-	-	36	<2	-	-	-	-	-
Sulphate (filtered)	mg/L	1		**500**	25	22	18	21	22	8	8	6	-	-	1.37	<0.10	3.28	<0.50	<0.50
Ammonia as N	mg/L	0.01			0.12	0.15	0.16	0.14	0.2	0.1	<0.1	<0.1	0.1	<0.1	0.42	0.25	0.36	0.48	0.19
Nitrate (as N)	mg/L	0.05		**10**	0.12	<0.05	0.06	<0.05	0.10	<0.06	<0.06	0.07	<0.06	<0.06	0.05	<0.05	0.12	<0.25	<0.25
Nitrite (as N)	mg/L	0.03		**1**	-	-	-	-	-	-	<0.3	<0.3	<0.3	<0.3	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.1			0.6	0.7	0.9	0.6	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	2.62	1	2.66	1.47	0.8
Electrical Conductivity (Lab)	µS/cm	1			1,510	1,330	1,430	1,330	1,840	1,610	1,520	1,620	2,410	1,660	764	434	545	740	638
pH (Lab)	-	0.05		**6.5-8.5**	7.36	6.97	7.28	7.18	7.35	7.40	8.12	**6.11**	7.46	7.12	7.59	8.08	7.08	7.57	7.95
DO (Field)	mg/L				6.2	5.96	6.59	11.56	2.69	6.95	7.25	4.33	8.09	13.51	-	-	-	-	-
Redox (Field)	mV				110	251	-	163	60	-9	-240	-71	1	-54	-	-	-	-	-
Temperature (Field)	°C				5.6	7.5	7.3	6.4	15.8	6.7	10.2	5.3	15.1	3.8	-	-	-	-	-
Conductivity (field)	µS/cm				1,510	1,112	1,585	1,545	1,169	1,577	2,143	1,865	2,133	2,511	-	-	-	-	-
pH (Field)	-			**6.5-8.5**	6.76	6.55	6.81	6.67	6.54	**6.12**	**6.49**	**6.24**	6.78	6.91	-	-	-	-	-

Table 4 - Groundwater Quality

					Location Code	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2
					Date	16 Apr 2015	16 Apr 2016	16 Oct 2016	06 Jun 2017	02 Oct 2017	29 May 2018	12 Nov 2018	18 Apr 2019	21 Apr 2020	12 Nov 2020	19 Apr 2021	03 Nov 2021	16 Jun 2022	09 Nov 2022	25 May 2023
	Unit	EQL	***RUC***	**ODWQS**																
Barium (filtered)	µg/L	0.08	***261***	**1,000**	-	73	86	65	90	55	64	36	68	67	83	69	83.1	102	53.5
Boron (filtered)	µg/L	2		**5,000**	-	23	<10	19	19	35	9	42	30	43	25	11	48	8	9
Calcium (filtered)	µg/L	10			-	85,100	115,000	103,000	133,000	74,200	109,000	64,900	117,000	127,000	137,000	140,000	131,000	64,500	101,000
Chloride	µg/L	500	***143,750***	**250,000**	-	38,100	30,000	27,800	37,100	31,100	22,600	16,000	38,200	32,200	34,300	49,800	34,000	29,000	25,000
Iron (filtered)	µg/L	5	***157***	**300**	-	***25,900***	***13,200***	***26,500***	***7,110***	***13,300***	***3,830***	***23,900***	***21,400***	***20,500***	***31,300***	50	***20,400***	***7,930***	***44,100***
Magnesium (filtered)	µg/L	1			-	3,340	4,300	3,810	5,430	2,980	4,970	2,620	4,740	5,060	5,420	5,580	4,720	2,400	3,690
Manganese (filtered)	µg/L	0.01	***33***	**50**	-	***616***	***531***	***543***	***493***	***420***	***559***	***359***	***665***	***776***	***759***	***680***	***760***	***216***	***629***
Potassium (filtered)	µg/L	9			-	1,620	1,480	1,300	1,600	1,400	1,600	1,300	1,600	1,600	1,600	1,800	1,560	1,160	1,810
Sodium (filtered)	µg/L	10		**200,000**	-	6,710	10,500	9,600	13,400	7,200	10,600	5,600	8,500	10,500	9,800	12,600	9,980	1,900	7,430
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	-	***375***	347	338	***379***	313	***353***	323	***353***	339	333	***350***	***371***	***400***	306
Total Dissolved Solids	mg/L	3	***409***	**500**	-	***434***	***414***	400	***464***	349	364	353	***417***	407	399	***418***	***460***	***446***	323
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	-	226	305	274	***355***	198	293	173	312	338	***365***	***373***	346	171	268
Chemical Oxygen Demand	mg/L	5			-	39	36	311	81	163	209	198	93	116	145	204	64	68	57
Total Suspended Solids	mg/L	2			-	1,630	348	-	-	-	-	-	-	-	-	-	-	-	1,530
Biochemical Oxygen Demand	mg/L	2			-	<5	<5	-	-	-	-	-	-	-	-	-	-	-	<4
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	**13.9**	**17.8**	**18.9**	**27**	**16.6**	**49.6**	**15.3**	**17.4**	**19.1**	**11.9**	**19.7**	**16.8**	**11**	**15**	**10**
Sulphate	mg/L	1		**500**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		**500**	-	<0.20	<0.50	<1	<1	<1	<1	<1	<1	<1	1	4	<20	<2	<2
Ammonia as N	mg/L	0.01			-	0.58	0.32	0.64	0.59	0.76	0.73	1	1.10	0.71	0.82	0.66	0.7	0.9	0.7
Nitrate (as N)	mg/L	0.05		**10**	-	<0.10	<0.25	<0.05	<0.05	0.29	0.07	3.1	0.06	<0.05	0.08	<0.05	<0.06	<0.06	<0.06
Nitrite (as N)	mg/L	0.03		**1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.03
Total Kjeldahl Nitrogen	mg/L	0.1			-	2.04	1.07	2.6	1.4	8.2	3.5	3.1	2.3	2.2	1.9	2.8	1.4	2.2	1.0
Electrical Conductivity (Lab)	µS/cm	1			-	715	705	727	843	672	701	680	795	776	762	796	755	716	617
pH (Lab)	-	0.05		**6.5-8.5**	-	7.47	7.66	7.79	7.37	7.7	7.65	7.6	7.19	7.31	7.43	7.08	7.37	7.46	7.95
DO (Field)	mg/L				-	7.2	-	8.04	9.27	8.18	9.42	7.83	9.04	5.14	10.9	9.43	6.27	10.58	8.01
Redox (Field)	mV				-	-	-	48	59	56	123	122	64	199	155	60	62	-36	-224
Temperature (Field)	°C				-	7.5	-	10.2	11.5	18.1	6.4	3	3.3	8.1	4.9	6.5	18.8	7.7	17.2
Conductivity (field)	µS/cm				-	951	-	830	760	610	770	500	650	663	741	740	822	650	584
pH (Field)	-			**6.5-8.5**	-	**6.2**	-	7.13	7.21	7.24	6.8	7.12	6.84	6.88	6.98	6.97	7.69	7.04	6.61

Table 4 - Groundwater Quality

				Location Code	DP2	DP2	DP2	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3
				Date	21 Nov 2023	28 May 2024	13 Nov 2024	01 May 2012	13 Nov 2012	31 May 2013	03 Dec 2013	10 Jun 2014	04 Nov 2014	16 Apr 2015	29 Oct 2015	16 Apr 2016	29 Oct 2016	06 Jun 2017	02 Oct 2017
	Unit	EQL	***RUC***	**ODWQS**															
Barium (filtered)	µg/L	0.08	***261***	**1,000**	63.1	61.7	66.1	42	40	43	34	38	33	31	31	34	25	31	34
Boron (filtered)	µg/L	2		**5,000**	20	28	20	246	222	229	192	177	176	156	181	159	173	153	230
Calcium (filtered)	µg/L	10			128,000	124,000	129,000	85,900	82,100	82,500	84,900	76,400	74,600	76,800	82,100	75,500	67,300	72,000	87,600
Chloride	µg/L	500	***143,750***	**250,000**	31,000	34,000	26,000	***240,000***	8,270	7,460	6,520	5,660	6,190	8,430	7,230	7,110	6,520	5,800	-
Iron (filtered)	µg/L	5	***157***	**300**	***26,800***	***17,000***	***21,600***	***800***	***1,950***	***2,770***	***3,400***	***4,800***	***785***	***4,000***	***2,230***	***10,700***	***7,090***	***3,130***	***8,800***
Magnesium (filtered)	µg/L	1			4,490	5,280	4,350	85,900	5,510	5,240	5,310	4,710	5,210	4,870	5,120	4,890	4,120	4,700	6,570
Manganese (filtered)	µg/L	0.01	***33***	**50**	***757***	***1,570***	***674***	***574***	***353***	***613***	***522***	***369***	***227***	***281***	***474***	***336***	***261***	***126***	***517***
Potassium (filtered)	µg/L	9			1,760	2,610	1,750	8,370	7,890	9,330	8,330	7,650	7,860	6,750	8,620	7,100	7,530	7,800	9,700
Sodium (filtered)	µg/L	10		**200,000**	9,860	19,000	10,600	6,240	7,200	7,990	8,610	6,800	7,710	6,130	7,920	6,460	7,400	7,600	9,800
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	348	333	***350***	240	201	231	234	181	228	200	236	205	196	173	242
Total Dissolved Solids	mg/L	3	***409***	**500**	***420***	***449***	***414***	294	296	296	296	264	284	-	280	252	258	246	306
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	338	331	341	237	228	228	234	210	208	212	226	209	185	199	246
Chemical Oxygen Demand	mg/L	5			59	66	67	41	33	80	50	127	27	-	39	19	16	62	101
Total Suspended Solids	mg/L	2			-	-	-	110	260	2,190	258	424	63	-	236	144	33	-	-
Biochemical Oxygen Demand	mg/L	2			-	-	-	<5	<5	<5	-	<5	<5	-	-	<5	<5	-	-
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	**9**	**12**	**10**	**5.9**	4.3	**6.7**	**9.9**	4.8	3.6	4.8	**11.1**	**5.7**	**5.7**	**12**	**21.9**
Sulphate	mg/L	1		**500**	-	<2	<20	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		**500**	<2	-	-	38.1	42	38.3	30.2	32.7	27.6	33.7	15.1	34.1	20.2	36	-
Ammonia as N	mg/L	0.01			0.6	0.7	0.7	0.06	0.03	0.23	0.15	0.19	0.08	-	0.14	0.06	0.08	0.27	0.22
Nitrate (as N)	mg/L	0.05		**10**	<0.06	<0.06	<0.06	0.39	0.09	0.41	<0.1	0.12	<0.05	<0.25	<0.10	0.13	<0.05	0.94	-
Nitrite (as N)	mg/L	0.03		**1**	<0.03	<0.03	<0.03	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.1			1.3	1.8	1.6	1.29	0.34	7.56	1.64	0.8	1.04	-	1.86	0.36	0.57	0.9	0.6
Electrical Conductivity (Lab)	µS/cm	1			682	628	703	506	418	525	522	458	497	451	489	430	424	447	556
pH (Lab)	-	0.05		**6.5-8.5**	7.99	7.68	7.25	7.72	8.1	7.4	7.9	8.03	7.99	8.01	7.89	7.93	7.82	8.07	8.16
DO (Field)	mg/L				2.2	7.42	8.6	-	-	-	-	-	-	-	-	-	-	9.93	9.89
Redox (Field)	mV				-87	-72	-37	-	-	-	-	-	-	-	-	-	-	9	118
Temperature (Field)	°C				5.1	14.2	3.8	-	-	-	-	-	-	-	-	-	-	14.4	11.9
Conductivity (field)	µS/cm				669	468	820	-	-	-	-	-	-	-	-	-	-	500	540
pH (Field)	-			**6.5-8.5**	**6.27**	7.11	7.29	-	-	-	-	-	-	-	-	-	-	7.89	7.81

Table 4 - Groundwater Quality

				Location Code	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP4	DP4
				Date	29 May 2018	12 Nov 2018	18 Apr 2019	21 Apr 2020	12 Nov 2020	19 Apr 2021	03 Nov 2021	16 Jun 2022	09 Nov 2022	25 May 2023	21 Nov 2023	28 May 2024	13 Nov 2024	01 May 2012	13 Nov 2012
	Unit	EQL	***RUC***	**ODWQS**															
Barium (filtered)	µg/L	0.08	***261***	**1,000**	32	25	25	24	24	25	28	34.5	18.5	23.1	29.2	20.7	23.7	22	17
Boron (filtered)	µg/L	2		**5,000**	219	183	167	146	194	148	192	205	38	166	118	111	102	23	20
Calcium (filtered)	µg/L	10			66,400	75,900	66,300	66,200	70,800	66,500	78,000	72,200	91,900	62,800	61,400	54,200	73,300	78,100	68,400
Chloride	µg/L	500	***143,750***	**250,000**	4,100	5,400	3,800	4,200	4,900	5,800	7,300	5,000	-	5,000	9,000	9,000	10,000	7,520	14,000
Iron (filtered)	µg/L	5	***157***	**300**	***7,810***	***7,540***	***12,000***	***9,270***	***10,200***	***13,500***	***13,500***	***9,680***	19	***6,380***	***9,040***	***8,890***	***20,700***	***8,320***	***1,270***
Magnesium (filtered)	µg/L	1			4,820	5,420	4,590	4,400	4,630	4,390	5,310	4,140	6,030	4,030	4,000	3,350	4,590	3,280	3,110
Manganese (filtered)	µg/L	0.01	***33***	**50**	***389***	***429***	***217***	***118***	***183***	***168***	***250***	***117***	23.4	***203***	***386***	***187***	***404***	***103***	20
Potassium (filtered)	µg/L	9			7,800	7,600	6,000	6,700	7,500	6,900	8,300	7,220	6,140	7,280	6,480	6,500	7,010	6,660	6,210
Sodium (filtered)	µg/L	10		**200,000**	8,100	8,300	6,000	6,000	7,700	6,400	8,900	7,340	18,000	6,780	6,540	6,740	8,020	6,000	-
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	193	222	182	158	171	161	213	207	148	160	183	162	224	197	177
Total Dissolved Solids	mg/L	3	***409***	**500**	236	240	229	194	209	197	243	303	290	217	194	186	203	236	242
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	186	212	185	184	196	184	217	197	254	173	170	149	202	209	184
Chemical Oxygen Demand	mg/L	5			63	34	51	28	78	38	59	26	-	45	86	21	64	185	43
Total Suspended Solids	mg/L	2			-	-	-	-	-	-	-	-	-	51	-	-	-	218	592
Biochemical Oxygen Demand	mg/L	2			-	-	-	-	-	-	-	-	-	<4	-	-	-	<5	<5
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	4.5	**6**	**6.8**	**5.8**	4.5	**5.8**	**8.7**	5	5	5	4	4	4	4.6	4.2
Sulphate	mg/L	1		**500**	-	-	-	-	-	-	-	-	-	-	-	8	4	-	-
Sulphate (filtered)	mg/L	1		**500**	40	22	32	24	19	16	25	29	-	16	4	-	-	8.41	9.75
Ammonia as N	mg/L	0.01			0.17	0.12	0.16	0.08	0.08	0.08	0.09	<0.1	0.2	<0.1	<0.1	<0.1	0.2	3.78	0.2
Nitrate (as N)	mg/L	0.05		**10**	0.64	0.14	0.26	0.31	0.08	0.06	0.08	0.15	-	<0.06	0.13	<0.06	<0.06	0.24	0.2
Nitrite (as N)	mg/L	0.03		**1**	-	-	-	-	-	-	-	-	-	<0.03	<0.03	<0.03	<0.03	-	-
Total Kjeldahl Nitrogen	mg/L	0.1			0.7	0.6	0.8	0.4	0.4	0.3	0.5	0.6	<0.5	<0.5	<0.5	0.8	<0.5	1.93	0.62
Electrical Conductivity (Lab)	µS/cm	1			457	464	443	377	405	383	470	445	390	341	380	325	413	392	360
pH (Lab)	-	0.05		**6.5-8.5**	8.12	7.84	7.97	7.57	7.79	7.73	7.33	7.78	8.30	8.14	7.89	8.11	7.37	7.89	8.11
DO (Field)	mg/L				7.05	6.25	5.56	3.63	3.47	8.4	5.1	6.34	5.93	6.39	9.3	3.78	10.65	-	-
Redox (Field)	mV				21	123	121	46	190	63	13	205	56	-248	12	-71	-52	-	-
Temperature (Field)	°C				12	6	3	3.2	7.2	5.4	7.4	15.8	6.3	11.5	4	11.8	2.9	-	-
Conductivity (field)	µS/cm				390	530	490	410	312	407	435	531	316	368	540	371	455	-	-
pH (Field)	-			**6.5-8.5**	7.35	7.3	**4**	7.21	7.01	7.23	7.2	**9.03**	6.92	6.99	6.98	7.15	7.26	-	-

Table 4 - Groundwater Quality

				Location Code	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4
				Date	31 May 2013	03 Dec 2013	10 Jun 2014	04 Nov 2014	16 Apr 2015	29 Oct 2015	16 Apr 2016	29 Oct 2016	06 Jun 2017	02 Oct 2017	29 May 2018	12 Nov 2018	18 Apr 2019	21 Apr 2020	12 Nov 2020
	Unit	EQL	***RUC***	**ODWQS**															
Barium (filtered)	µg/L	0.08	***261***	**1,000**	24	16	23	17	17	16	11	16	-	16	-	12	-	14	-
Boron (filtered)	µg/L	2		**5,000**	15	22	15	18	20	24	14	21	-	19	-	14	-	20	-
Calcium (filtered)	µg/L	10			65,800	77,700	57,700	67,900	73,900	70,900	148,000	66,600	-	66,600	-	68,000	-	53,200	-
Chloride	µg/L	500	***143,750***	**250,000**	380	11,300	5,590	16,800	14,200	15,000	***218,000***	10,100	5,000	-	7,300	-	-	-	-
Iron (filtered)	µg/L	5	***157***	**300**	***18,300***	***7,280***	***25,100***	***2,730***	***11,400***	***1,070***	<10	***2,120***	-	***1,700***	-	***406***	-	***8,550***	-
Magnesium (filtered)	µg/L	1			2,860	3,290	2,370	3,120	3,090	3,050	12,100	2,670	-	3,140	-	3,090	-	2,280	-
Manganese (filtered)	µg/L	0.01	***33***	**50**	***48***	***65***	***106***	***45***	***121***	***37***	8	32	-	***55***	-	***54***	-	***123***	-
Potassium (filtered)	µg/L	9			5,840	6,860	4,620	6,110	5,740	8,120	5,490	6,200	-	7,000	-	6,200	-	4,100	-
Sodium (filtered)	µg/L	10		**200,000**	5,720	8,370	4,200	6,000	5,330	-	145,000	5,970	-	6,200	-	6,100	-	3,900	-
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	188	217	142	193	192	-	***483***	186	158	179	163	-	-	-	-
Total Dissolved Solids	mg/L	3	***409***	**500**	212	246	184	246	-	-	158	218	185	211	186	-	-	-	-
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	176	208	154	182	197	190	***419***	177	-	179	-	183	-	142	-
Chemical Oxygen Demand	mg/L	5			58	113	50	28	-	489	6	23	-	-	690	-	134	-	105
Total Suspended Solids	mg/L	2			516	956	892	564	-	-	<10	632	-	-	-	-	-	-	-
Biochemical Oxygen Demand	mg/L	2			<5	-	<5	<5	-	-	<5	<5	-	-	-	-	-	-	-
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	4.3	4.7	3.8	4.1	**6.5**	-	**6.2**	**5.4**	-	**8**	-	-	-	-	-
Sulphate	mg/L	1		**500**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		**500**	1.3	7.82	5.2	6.5	9.5	7.62	14.4	8.9	7	-	10	-	-	-	-
Ammonia as N	mg/L	0.01			<0.02	0.71	0.15	0.18	-	1.75	<0.02	0.04	-	-	0.08	-	0.1	0.06	0.07
Nitrate (as N)	mg/L	0.05		**10**	<0.05	0.06	<0.05	<0.05	<0.25	0.17	<0.25	<0.05	<0.05	-	0.45	-	-	-	-
Nitrite (as N)	mg/L	0.03		**1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.1			1.55	2.47	1.09	0.74	-	4.91	0.19	0.54	-	-	1.5	-	1.1	1.4	0.5
Electrical Conductivity (Lab)	µS/cm	1			398	454	326	432	422	-	1,330	393	336	383	362	-	-	-	-
pH (Lab)	-	0.05		**6.5-8.5**	7.26	7.75	8.01	8.07	8.02	-	7.94	7.99	8.01	8.1	8.21	-	-	-	-
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	-	9.37	4.92	8.59	4.11	9.06
Redox (Field)	mV				-	-	-	-	-	-	-	-	-	-	7	124	111	44	200
Temperature (Field)	°C				-	-	-	-	-	-	-	-	-	-	16.3	6	7	4.7	7.1
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	-	320	470	390	460	297
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	-	7.37	7.74	7.29	7.36	7.46

Table 4 - Groundwater Quality

				Location Code	DP4	DP4	DP4	DP4	DP4	DP4	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L
				Date	19 Apr 2021	03 Nov 2021	16 Jun 2022	09 Nov 2022	25 May 2023	28 May 2024	07 May 2012	13 Nov 2012	31 May 2013	03 Dec 2013	06 Jun 2014	04 Nov 2014	16 Apr 2015	29 Oct 2015
	Unit	EQL	***RUC***	**ODWQS**														
Barium (filtered)	µg/L	0.08	***261***	**1,000**	18	14	15.2	-	15.4	13.4	10	9	14	16	15	12	20	24
Boron (filtered)	µg/L	2		**5,000**	20	18	77	-	23	17	949	1,100	1,100	1,020	1,100	977	1,190	1,040
Calcium (filtered)	µg/L	10			73,800	69,300	61,000	-	65,800	60,900	16,100	15,800	16,900	16,100	27,400	17,200	19,500	19,800
Chloride	µg/L	500	***143,750***	**250,000**	-	-	-	-	11,000	-	***304,000***	***352,000***	***370,000***	***343,000***	***263,000***	***352,000***	***379,000***	***313,000***
Iron (filtered)	µg/L	5	***157***	**300**	***4,520***	***1,650***	***10,400***	-	***1,340***	***651***	119	65	107	100	<10	<10	<10	<10
Magnesium (filtered)	µg/L	1			3,240	3,110	2,460	-	2,860	2,720	1,970	1,980	2,100	2,000	2,310	2,150	2,440	2,330
Manganese (filtered)	µg/L	0.01	***33***	**50**	***114***	***94***	***127***	-	***79.4***	***80.7***	30	19	13	12	9	5	5	14
Potassium (filtered)	µg/L	9			6,400	6,500	5,470	-	6,580	6,240	3,410	3,620	4,440	4,420	10,500	5,170	5,290	5,150
Sodium (filtered)	µg/L	10		**200,000**	5,600	6,100	4,540	-	5,510	5,630	**306,000**	**288,000**	**328,000**	**309,000**	**252,000**	**318,000**	**336,000**	**313,000**
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	-	-	-	-	134	-	234	218	230	236	202	261	244	258
Total Dissolved Solids	mg/L	3	***409***	**500**	-	-	-	-	186	-	***848***	***840***	***898***	***870***	***950***	***896***	***958***	***928***
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	198	186	163	-	176	163	48	48	51	48	78	51.8	58.7	59
Chemical Oxygen Demand	mg/L	5			272	442	580	-	65	-	28	30	31	28	26	28	25	25
Total Suspended Solids	mg/L	2			-	-	-	-	1,850	-	51	64	69	102	77	150	75	102
Biochemical Oxygen Demand	mg/L	2			-	-	-	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	**6.5**	4.9	-	-	2	**7**	**71.4**	**30**	**10.7**	**11.1**	**11.8**	**9.6**	**11.3**	**9.3**
Sulphate	mg/L	1		**500**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		**500**	-	-	-	-	5	-	66	61.4	68.5	69.5	51.4	84.3	97.2	87.2
Ammonia as N	mg/L	0.01			0.12	0.17	-	-	<0.1	0.2	0.07	0.04	<0.02	0.12	0.05	0.04	<0.02	0.05
Nitrate (as N)	mg/L	0.05		**10**	-	-	-	-	<0.06	-	<0.05	<0.05	<0.5	<0.5	<0.25	<0.5	<0.5	<0.25
Nitrite (as N)	mg/L	0.03		**1**	-	-	-	-	<0.03	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.1			2.3	0.7	-	-	<0.5	1.4	0.82	1.65	0.92	0.44	0.92	0.4	0.27	0.65
Electrical Conductivity (Lab)	µS/cm	1			-	-	-	-	301	-	1,570	1,440	1,730	1,720	2,600	1,720	1,700	1,750
pH (Lab)	-	0.05		**6.5-8.5**	-	-	-	-	8.08	-	8.14	8.22	8.2	8.26	7.95	8.47	8.21	7.81
DO (Field)	mg/L				11.14	3.88	2.42	8.05	4.65	6.48	-	-	-	-	-	-	-	-
Redox (Field)	mV				175	16	-8	-34	-249	-33	-	-	-	-	-	-	-	-
Temperature (Field)	°C				7.6	7.7	12.6	7.4	6.9	10.5	-	-	-	-	-	-	-	-
Conductivity (field)	µS/cm				4	366	330	359	369	359	-	-	-	-	-	-	-	-
pH (Field)	-			**6.5-8.5**	6.56	7.36	**9.14**	6.82	6.91	6.87	-	-	-	-	-	-	-	-

Table 4 - Groundwater Quality

				Location Code	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L	MW1-L
				Date	16 Apr 2016	29 Oct 2016	06 Jun 2017	02 Oct 2017	29 May 2018	12 Nov 2018	18 Apr 2019	21 Apr 2020	12 Nov 2020	19 Apr 2021	03 Nov 2021	16 Jun 2022	09 Nov 2022	25 May 2023
	Unit	EQL	***RUC***	**ODWQS**														
Barium (filtered)	µg/L	0.08	***261***	**1,000**	36	40	31	30	33	34	38	42	41	54	43	39.9	72.8	43.2
Boron (filtered)	µg/L	2		**5,000**	1,220	1,190	1,200	1,240	1,310	1,300	1,250	1,460	1,490	1,500	1,530	1,490	200	1,480
Calcium (filtered)	µg/L	10			22,600	24,300	22,800	23,500	23,600	22,800	23,900	26,000	25,500	26,600	26,200	30,300	29,300	31,300
Chloride	µg/L	500	***143,750***	**250,000**	***368,000***	***344,000***	***278,000***	***242,000***	***309,000***	***392,000***	***291,000***	***323,000***	***296,000***	***283,000***	***296,000***	***540,000***	***310,000***	***300,000***
Iron (filtered)	µg/L	5	***157***	**300**	29	<10	<5	32	37	49	40	69	62	46	21	42	***218***	37
Magnesium (filtered)	µg/L	1			2,790	2,670	2,810	3,130	2,880	2,880	2,920	3,190	3,250	3,330	3,410	2,900	4,020	3,340
Manganese (filtered)	µg/L	0.01	***33***	**50**	12	7	6	12	14	14	12	13	14	7	5	13.5	***50.2***	6.07
Potassium (filtered)	µg/L	9			5,830	6,470	5,800	6,300	6,100	5,900	5,800	6,500	6,100	6,500	6,600	5,670	1,850	6,670
Sodium (filtered)	µg/L	10		**200,000**	**336,000**	**320,000**	**365,000**	**363,000**	**374,000**	**348,000**	**320,000**	**355,000**	**352,000**	**365,000**	**380,000**	**342,000**	56,100	**370,000**
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	262	263	268	267	258	291	259	266	259	262	281	289	294	297
Total Dissolved Solids	mg/L	3	***409***	**500**	***928***	***988***	***1,010***	***997***	***926***	***949***	***977***	***951***	***943***	***966***	***978***	***974***	***989***	***1,060***
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	67.9	71.7	69	72	71	69	72	78	77	80	80	87.5	89.8	91.9
Chemical Oxygen Demand	mg/L	5			22	24	30	67	34	39	42	37	13	56	21	34	36	32
Total Suspended Solids	mg/L	2			71	68	108	63	142	38	210	146	51	148	28	35	-	24
Biochemical Oxygen Demand	mg/L	2			<5	<5	<2	<2	<2	4	<3	<3	<3	<3	<3	<4	<4	<4
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	**12.3**	**12.8**	**8.1**	**5.4**	**8**	**5.7**	**6.5**	**5.7**	3.1	**5.4**	4.8	**13**	**13**	**13**
Sulphate	mg/L	1		**500**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		**500**	121	126	100	100	124	121	130	136	140	151	183	160	160	170
Ammonia as N	mg/L	0.01			<0.02	<0.02	<0.01	0.03	0.03	0.05	0.04	0.02	0.05	0.04	0.02	<0.1	<0.1	<0.1
Nitrate (as N)	mg/L	0.05		**10**	<0.25	<0.5	0.36	0.22	0.27	0.24	0.21	0.27	0.17	<0.05	0.35	0.24	0.24	0.35
Nitrite (as N)	mg/L	0.03		**1**	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.03
Total Kjeldahl Nitrogen	mg/L	0.1			0.59	0.52	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	<0.5	<0.5	<0.5
Electrical Conductivity (Lab)	µS/cm	1			1,690	1,820	1,840	1,810	1,690	1,730	1,780	1,730	1,720	1,760	1,780	1,740	1,770	1,760
pH (Lab)	-	0.05		**6.5-8.5**	8.33	7.82	8.12	8.32	8.23	7.81	8.19	8.08	8.03	8.15	8	8.21	8.36	8.25
DO (Field)	mg/L				-	-	10.92	6.44	5.84	5.28	5.66	7.56	6.77	10.33	8.7	6.19	7.94	4.96
Redox (Field)	mV				-	-	38	116	42	173	173	94	183	139	41	225	114	-211
Temperature (Field)	°C				-	-	13.1	13.4	14.5	6.1	10	7.9	8.7	11.3	8.8	14.4	9.2	16.2
Conductivity (field)	µS/cm				-	-	1,720	1,700	1,450	1,630	1,520	1,110	1,308	1,711	1,517	1,911	1,317	1,646
pH (Field)	-			**6.5-8.5**	-	-	7.81	8.1	7.84	7.63	7.56	7.02	7.92	7.9	7.68	**8.53**	7.92	7.6

Table 4 - Groundwater Quality

				Location Code	MW1-L	MW1-L	MW1-L	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U
				Date	21 Nov 2023	28 May 2024	13 Nov 2024	01 May 2012	13 Nov 2012	31 May 2013	03 Dec 2013	06 Jun 2014	04 Nov 2014	16 Apr 2015	29 Oct 2015	16 Apr 2016	29 Oct 2016	06 Jun 2017
	Unit	EQL	***RUC***	**ODWQS**														
Barium (filtered)	µg/L	0.08	***261***	**1,000**	39.1	37.0	46.9	58	41	41	35	46	44	46	48	57	26	29
Boron (filtered)	µg/L	2		**5,000**	1,210	1,370	1,600	302	286	339	349	365	370	423	443	432	394	280
Calcium (filtered)	µg/L	10			32,000	29,700	37,900	525,000	580,000	441,000	366,000	266,000	345,000	365,000	396,000	379,000	237,000	299,000
Chloride	µg/L	500	***143,750***	**250,000**	***280,000***	***290,000***	***290,000***	***515,000***	***781,000***	***483,000***	***295,000***	***331,000***	***382,000***	***437,000***	***471,000***	***466,000***	***170,000***	***205,000***
Iron (filtered)	µg/L	5	***157***	**300**	34	35	60	***4,710***	***3,560***	***3,130***	***1,660***	***4,590***	***3,580***	***3,850***	***4,260***	***3,660***	***1,160***	***995***
Magnesium (filtered)	µg/L	1			3,210	3,400	3,850	30,000	34,500	27,400	22,400	24,600	22,600	23,200	25,100	26,500	16,500	26,600
Manganese (filtered)	µg/L	0.01	***33***	**50**	4.03	5.84	***51.2***	***5,020***	***5,460***	***3,520***	***4,280***	***4,080***	***4,350***	***4,660***	***4,870***	***4,580***	***4,830***	***3,190***
Potassium (filtered)	µg/L	9			6,140	6,040	6,830	11,100	11,700	10,700	10,200	5,100	8,790	10,200	11,000	11,000	8,610	11,100
Sodium (filtered)	µg/L	10		**200,000**	**332,000**	**381,000**	**384,000**	**362,000**	**414,000**	**351,000**	**312,000**	**313,000**	**334,000**	**365,000**	**401,000**	**369,000**	**259,000**	176,000
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	298	294	298	***1,460***	***1,330***	***1,360***	***1,280***	***1,040***	***1,360***	***1,230***	***1,310***	***1,290***	***1,130***	***852***
Total Dissolved Solids	mg/L	3	***409***	**500**	***931***	***1,070***	***1,030***	***2,580***	***2,300***	***2,560***	***1,970***	***1,750***	***2,010***	***1,940***	***2,140***	***1,860***	***1,700***	***1,270***
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	93.1	88.1	111	***1,430***	***1,590***	***1,210***	***1,010***	***766***	***955***	***1,010***	***1,090***	***1,060***	***660***	***856***
Chemical Oxygen Demand	mg/L	5			28	27	29	164	158	159	114	87	133	106	139	110	97	63
Total Suspended Solids	mg/L	2			36	50	53	186	140	1,080	204	138	214	97	94	596	76	140
Biochemical Oxygen Demand	mg/L	2			<4	<4	<4	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<2
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	**12**	**11**	**10**	**71.4**	**63.8**	**19.1**	**56.6**	**56.8**	**52.9**	**49.2**	**52**	**57.9**	**50.6**	**18.8**
Sulphate	mg/L	1		**500**	-	190	250	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		**500**	170	-	-	76	85.8	83.1	51.9	148	43.2	50.7	34.6	50.4	59.9	56
Ammonia as N	mg/L	0.01			<0.1	<0.1	<0.1	0.41	0.46	0.24	0.43	0.47	0.41	0.26	0.36	0.38	0.22	0.33
Nitrate (as N)	mg/L	0.05		**10**	0.36	0.26	0.28	<0.05	<0.05	<0.05	<1.0	<0.25	<1.0	<1.0	<1.0	<1.0	<0.5	<0.05
Nitrite (as N)	mg/L	0.03		**1**	<0.03	<0.03	<0.03	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.1			0.8	0.8	<0.5	3.77	3.14	4.94	2.28	3.34	2.62	2.09	2.93	2.44	2.47	1.4
Electrical Conductivity (Lab)	µS/cm	1			1,760	1,750	1,850	3,740	3,730	3,660	3,130	1,760	3,210	3,110	3,540	2,970	2,380	2,310
pH (Lab)	-	0.05		**6.5-8.5**	8.33	8.39	8.02	8.14	7.56	7.68	7.79	7.82	8.01	7.71	7.9	7.92	8.03	7.21
DO (Field)	mg/L				5.52	8.28	6.34	-	-	-	-	-	-	-	-	-	-	3.33
Redox (Field)	mV				5	155	-5	-	-	-	-	-	-	-	-	-	-	12
Temperature (Field)	°C				3.5	11.8	7.3	-	-	-	-	-	-	-	-	-	-	11.4
Conductivity (field)	µS/cm				1,439	1,844	1,694	-	-	-	-	-	-	-	-	-	-	2,200
pH (Field)	-			**6.5-8.5**	6.54	8.05	6.76	-	-	-	-	-	-	-	-	-	-	6.63

Table 4 - Groundwater Quality

				Location Code	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U	MW1-U
				Date	02 Oct 2017	29 May 2018	12 Nov 2018	18 Apr 2019	21 Apr 2020	12 Nov 2020	19 Apr 2021	03 Nov 2021	16 Jun 2022	09 Nov 2022	25 May 2023	21 Nov 2023	28 May 2024	13 Nov 2024
	Unit	EQL	***RUC***	**ODWQS**														
Barium (filtered)	µg/L	0.08	***261***	**1,000**	31	35	41	39	29	28	37	35	32.8	38.0	26.2	29.2	25.0	26.9
Boron (filtered)	µg/L	2		**5,000**	411	388	432	389	297	358	329	442	370	1,140	310	306	275	367
Calcium (filtered)	µg/L	10			273,000	277,000	280,000	275,000	255,000	255,000	291,000	270,000	259,000	26,700	274,000	245,000	244,000	296,000
Chloride	µg/L	500	***143,750***	**250,000**	***176,000***	***264,000***	***330,000***	***224,000***	90,000	81,200	93,100	***174,000***	***170,000***	***160,000***	79,000	130,000	140,000	130,000
Iron (filtered)	µg/L	5	***157***	**300**	***1,540***	***2,240***	***2,110***	***1,100***	***868***	***1,080***	***890***	***1,860***	***1,210***	72	***680***	***1,160***	***843***	***895***
Magnesium (filtered)	µg/L	1			22,400	22,600	21,400	21,000	23,600	20,400	25,300	21,600	20,300	2,570	24,700	18,600	23,400	20,100
Manganese (filtered)	µg/L	0.01	***33***	**50**	***5,910***	***5,670***	***6,120***	***5,620***	***3,620***	***5,810***	***4,750***	***6,850***	***6,830***	9.48	***3,820***	***6,570***	***5,010***	***7,280***
Potassium (filtered)	µg/L	9			10,800	10,900	10,600	10,000	11,500	9,900	12,100	10,400	9,190	4,830	12,300	9,250	10,400	10,500
Sodium (filtered)	µg/L	10		**200,000**	**262,000**	**269,000**	**293,000**	**245,000**	139,000	170,000	156,000	**206,000**	150,000	**267,000**	114,000	145,000	130,000	159,000
Alkalinity (total) as CaCO3	mg/L	2	***349***	**500**	***996***	***1,040***	***1,070***	***979***	***790***	***776***	***837***	***972***	***906***	***1,010***	***814***	***865***	***845***	***931***
Total Dissolved Solids	mg/L	3	***409***	**500**	***1,330***	***1,410***	***1,460***	***1,380***	***979***	***975***	***1,070***	***1,220***	***1,190***	***1,250***	***1,110***	***1,090***	***1,070***	***1,240***
Hardness as CaCO3 (filtered)	mg/L	0.05	***346***	**500**	***775***	***785***	***788***	***774***	***734***	***721***	***831***	***764***	***730***	77.1	***785***	***688***	***705***	***821***
Chemical Oxygen Demand	mg/L	5			127	80	140	129	58	100	86	111	83	85	58	81	80	78
Total Suspended Solids	mg/L	2			116	146	101	240	98	82	88	95	127	99	59	74	385	24
Biochemical Oxygen Demand	mg/L	2			<2	<2	5	<3	<3	<3	<3	<3	<4	<4	<4	<4	<4	<4
Dissolved Organic Carbon (filtered)	mg/L	0.2		**5**	**21.3**	**44.9**	**26**	**23.8**	**18.9**	**21.5**	**27.3**	**46.8**	**30**	**34**	**21**	**30**	**20**	**28**
Sulphate	mg/L	1		**500**	-	-	-	-	-	-	-	-	-	-	-	-	65	49
Sulphate (filtered)	mg/L	1		**500**	53	67	39	33	62	57	66	53	73	48	65	50	-	-
Ammonia as N	mg/L	0.01			0.52	0.35	0.54	0.54	0.25	0.73	0.29	0.5	0.3	0.5	0.2	0.4	0.5	0.4
Nitrate (as N)	mg/L	0.05		**10**	<0.05	0.06	0.05	<0.05	0.06	<0.05	0.05	0.28	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Nitrite (as N)	mg/L	0.03		**1**	-	-	-	-	-	-	-	-	-	-	<0.03	<0.03	<0.03	<0.03
Total Kjeldahl Nitrogen	mg/L	0.1			2.2	1.4	2.3	2.2	1.2	2.5	1.2	0.7	1.4	1.3	<0.5	2.0	1.9	1.6
Electrical Conductivity (Lab)	µS/cm	1			2,410	2,540	2,620	2,480	1,780	1,780	1,940	2,210	1,900	2,080	1,700	1,820	1,750	1,900
pH (Lab)	-	0.05		**6.5-8.5**	7.45	7.49	7.45	7.64	7.35	7.2	7.49	7.37	7.45	7.82	7.63	7.83	7.69	7.34
DO (Field)	mg/L				3.28	6.15	2.35	5.76	6.58	5.57	6.5	7.82	3.68	7.01	4.56	12.26	3.69	7.34
Redox (Field)	mV				129	60	167	169	89	191	144	31	258	140	-223	12	83	-28
Temperature (Field)	°C				10.7	12.8	8.1	10	7.8	9.3	12.1	8.8	15	10.1	13.1	3.2	11.2	6.7
Conductivity (field)	µS/cm				2,300	1,850	2,200	1,840	990	1,406	1,891	1,580	1,936	1,419	1,548	1,462	1,805	1,768
pH (Field)	-			**6.5-8.5**	6.78	6.86	6.72	6.95	6.55	7.06	6.87	6.9	7.85	6.83	6.63	7.08	6.82	7.9

Table 5 - VOC Analysis

	Unit	EQL	ODWQS	MW1-L 12 May 2009	MW1-L 14 Oct 2009	MW1-L 14 Jun 2010	MW1-L 27 Oct 2010	MW1-L 07 May 2012	MW1-L 31 May 2013	MW1-L 04 Nov 2014	MW1-L 16 Apr 2015	MW1-L 16 Apr 2016	MW1-L 06 Jun 2017	MW1-L 29 May 2018	MW1-L 18 Apr 2019	MW1-L 21 Apr 2020	MW1-L 19 Apr 2021	MW1-L 16 Jun 2022	MW1-L 25 May 2023	MW1-L 28 May 2024	MW1-U 12 May 2009	MW1-U 14 Oct 2009	MW1-U 14 Jun 2010	MW1-U 27 Oct 2010	MW1-U 07 May 2012	MW1-U 31 May 2013	MW1-U 04 Nov 2014
Benzene	µg/L	0.5	**1**	0.3	0.6	<0.1	<0.1	<0.40	<0.40	<0.20	<0.40	<0.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	0.7	0.5	0.35	<0.80	**1.2**
Toluene	µg/L	0.5	**60**	<0.2	<0.2	<0.2	<0.2	<0.40	<0.40	<0.20	<0.40	<0.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.20	<0.80	<0.80
Ethylbenzene	µg/L	0.5	**140**	<0.1	<0.1	<0.1	<0.1	<0.20	<0.20	<0.20	<0.20	<0.10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.10	<0.4	<0.80
Xylene (m & p)	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.40	<0.40	<0.20	<0.40	<0.20	<0.4	<0.4	<1.0	<1.0	<1	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.20	<0.80	<0.80
Xylene (o)	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.20	<0.20	<0.10	<0.20	<0.10	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.10	<0.40	<0.40
Xylene Total	µg/L	0.5	**90**	<0.1	<0.1	<0.1	<0.1	<0.40	<0.40	<0.20	<0.40	<0.20	-	<0.4	<1.1	<1.1	<1.1	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.20	<0.80	<0.80
Acetone	µg/L	30		<10	<10	<10	<10	<2.0	<2.0	<1.0	<2.0	<1.0	36	<2	<30	<30	<30	<30	-	-	<10	<10	<20	<30	<1.0	<4.0	<4.0
Bromoform	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.10	<0.20	<0.10	<0.1	<0.1	<5	<5	<5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.10	<0.40	<0.40
Bromomethane	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.40	<0.40	<0.20	<0.40	<0.20	<0.3	<0.3	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.20	<0.80	<0.80
Bromodichloromethane	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.40	<0.40	<0.20	<0.40	<0.20	<0.1	<0.1	<2	<2	<2	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.20	<0.80	<0.80
Carbon tetrachloride	µg/L	0.2	**2**	<0.1	<0.1	<0.1	<0.1	<0.40	<0.40	<0.20	<0.40	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.2	<0.3	<0.20	<0.80	<0.80
Chlorobenzene	µg/L	0.5	**80**	-	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	-	-	<0.5	<0.5	<0.5	-	-	-	-	-	-	-
Chloroethane	µg/L	3		-	-	-	-	<0.40	<0.40	<0.20	<0.40	<0.20	<0.1	<0.1	<3	-	<3	<5	<5	<5	-	-	-	-	2.8	<0.80	<0.80
Chloroform	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.40	<0.40	<0.20	<0.40	<0.20	<0.3	<0.3	<1	<1	<1	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.20	<0.80	<0.80
Chloromethane	µg/L	2		-	-	-	-	<0.80	<0.80	<0.40	<0.80	<0.40	<0.3	<0.3	<2	-	<2	<5	<5	<5	-	-	-	-	<0.40	<1.60	<1.60
Dibromochloromethane	µg/L	0.5		<0.2	<0.2	<0.2	-	<0.20	<0.20	<0.10	<0.20	<0.10	<0.1	<0.1	<2	<2	<2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	-	<0.10	<0.40	<0.40
Dibromomethane	µg/L			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromoethane,1,2-	µg/L	0.2		<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.10	<0.20	<0.10	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.5	<0.10	<0.40	<0.40
Dibromo-3-chloropropane, 1, 2-	µg/L			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorobenzene, 1,2-	µg/L	0.5	**200**	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.10	<0.20	<0.10	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.10	<0.40	<0.40
Dichlorobenzene, 1,3-	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.30	<0.20	<0.10	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.10	<0.40	<0.40
Dichlorobenzene, 1,4-	µg/L	0.5	**5**	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.10	<0.20	<0.10	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.10	<0.40	<0.40
Dichlorodifluoromethane	µg/L	2		-	-	-	<0.5	<0.60	<0.60	<1.0	<0.60	<0.30	<1	<1	<2	<2	<2	-	-	-	-	-	-	<1	<0.30	<1.20	<4.0
Dichloroethane, 1,1-	µg/L	0.5		0.2	0.2	<0.1	<0.1	<0.60	<0.60	<0.30	<0.60	<0.30	<0.1	<0.1	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	0.2	<0.3	<0.30	<1.20	<1.20
Dichloroethane, 1,2-	µg/L	0.5	**5**	<0.2	<0.2	<0.2	<0.2	<0.40	<0.40	<0.20	<0.40	<0.20	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.20	<0.80	<0.80
Dichloroethene, 1,1-	µg/L	0.5	**14**	<0.1	<0.1	<0.1	<0.1	<0.60	<0.60	<0.30	<0.60	<0.30	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.30	<1.20	<1.20
Dichloroethene, 1,2-cis-	µg/L	0.5		0.9	1.3	<0.1	<0.1	<0.40	<0.40	<0.20	<0.40	<0.20	<0.1	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.1	<0.1	1.3	1.3	1	1.4	1.7
Dichloroethene, 1,2-trans-	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.40	<0.40	<0.20	<0.40	<0.20	<0.1	<0.1	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.20	<0.80	<0.80
Dichloromethane	µg/L	0.5	**50**	<0.5	<0.5	<0.5	<0.2	<0.60	<0.60	<0.30	<0.40	<0.20	0.4	<0.3	<0.5	-	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.30	<1.20	<1.20
Dichloropropane, 1,2-	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.40	<0.40	<0.10	<0.40	<0.20	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.20	<0.80	<0.80
Dichloropropene, 1,1-	µg/L			-	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropane, 1,3-	µg/L			-	-	-	-	-	-	-	-	-	<0.2	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropane, 2,2-	µg/L			-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropene, 1,3-	µg/L	0.5		<0.4[#1]	<0.4[#1]	<0.4[#1]	<0.4[#1]	<1[#1]	<1[#1]	<0.5[#1]	<1[#1]	<0.5[#1]	<0.2[#1]	<0.2[#1]	<0.7[#1]	<1[#1]	<0.5	-	-	-	<0.4[#1]	<0.4[#1]	<0.8[#1]	<1[#1]	<0.5[#1]	<2[#1]	<2[#1]
Dichloropropene, 1,3- cis	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.40	<0.40	<0.20	<0.40	<0.20	<0.1	<0.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.20	<0.80	<0.80
Dichloropropene, 1,3- trans	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.60	<0.60	<0.30	<0.60	<0.30	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.30	<1.20	<1.20
Hexane	µg/L	5		-	-	-	-	-	-	-	<0.40	<0.20	<1	<1	<5	<5	<5	-	-	-	-	-	-	-	-	-	-
Methyl Butyl Ketone	µg/L			-	-	-	-	<0.60	<0.60	<0.30	<0.60	<1.0	<10	-	-	-	-	-	-	-	-	-	-	-	<0.30	<1.20	<1.20
Methyl Ethyl Ketone	µg/L	20		<5	<5	<5	<5	<2.0	<2.0	<0.10	<2.0	<1.0	<1	<1	<20	<20	<20	-	-	-	<5	<5	<10	<10	<1.0	<4.0	<0.40
Methyl Iso-Butyl Ketone	µg/L	20		<5	<5	<5	<5	<2.0	<2.0	<1.0	<2.0	<1.0	<1	<1	<20	<20	<20	-	-	-	<5	<5	<10	<10	<1.0	<4.0	<4.0
Methyl tert-butyl ether	µg/L	2		<0.2	<0.2	<0.2	<0.2	<0.40	<0.40	<0.20	<0.40	<0.20	<1	<1	<2	<2	<2	-	-	-	<0.2	<0.2	<0.4	<0.5	<0.20	<0.80	<0.80
Styrene	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.10	<0.20	<0.10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.10	<0.40	<0.40
Tetrachloroethene	µg/L	0.5	**10**	<0.1	<0.1	<0.1	<0.1	<0.40	<0.40	<0.20	<0.40	<0.20	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.20	<0.80	<0.80
Tetrachloroethane, 1,1,1,2-	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.20	<0.20	<0.10	<0.20	<0.10	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.10	<0.40	<0.40
Tetrachloroethane, 1,1,2,2-	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.10	<0.20	<0.10	<0.4	<0.4	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.10	<0.40	<0.40
Trichlorobenzene, 1,2,3-	µg/L			-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorobenzene, 1,2,4-	µg/L			-	-	-	-	-	-	-	<0.60	<0.30	<0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/L	0.5	**5**	-	-	<0.1	<0.1	<0.40	<0.40	<0.20	<0.40	<0.20	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.2	<0.3	<0.20	<0.80	<0.80
Trichloroethane, 1,1,1-	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.60	<0.60	<0.30	<0.60	<0.30	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2	<0.3	<0.30	<0.120	<1.20
Trichloroethane, 1,1,2-	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.40	<0.40	<0.20	<0.40	<0.20	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.4	<0.5	<0.20	<0.80	<0.80
Trichlorofluoromethane	µg/L	5		<0.1	<0.1	-	-	<0.80	<0.80	<0.40	<0.80	<0.40	<0.1	<0.1	<5	<5	<5	<5	<5	<5	<0.1	<0.1	-	-	<0.40	<1.60	<1.60
Trimethylbenzene, 1,3,5-	µg/L	0.1		-	-	-	-	-	-	-	-	-	<0.6	<0.6	<0.6	-	<0.1	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/L	0.2	**1**	<0.2	<0.2	<0.2	<0.2	<0.34	<0.34	<0.17	<0.34	<0.17	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.5	<0.17	<0.68	<0.68
Trichloropropane, 1,2,3-	µg/L			-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments
#1 ESDAT Combined.

Table 5 - VOC Analysis

	Unit	EQL	ODWQS	MW1-U 16 Apr 2015	MW1-U 16 Apr 2016	MW1-U 06 Jun 2017	MW1-U 29 May 2018	MW1-U 18 Apr 2019	MW1-U 21 Apr 2020	MW1-U 19 Apr 2021	MW1-U 16 Jun 2022	MW1-U 25 May 2023	MW1-U 28 May 2024
Benzene	µg/L	0.5	**1**	0.61	<0.40	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	**60**	<0.40	<0.40	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	**140**	<0.20	<0.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	µg/L	0.5		<0.40	<0.40	<0.4	<0.4	<1.0	<1.0	<1	<0.5	<0.5	<0.5
Xylene (o)	µg/L	0.5		<0.20	<0.20	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene Total	µg/L	0.5	**90**	<0.40	<0.40	-	<0.4	<1.1	<1.1	<1.1	<0.5	<0.5	<0.5
Acetone	µg/L	30		<2.0	<2.0	<2	<2	<30	<30	<30	<30	-	-
Bromoform	µg/L	0.5		<0.20	<0.20	<0.1	<0.1	<5	<5	<5	<0.5	<0.5	<0.5
Bromomethane	µg/L	0.5		<0.40	<0.40	<0.3	<0.3	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	µg/L	0.5		<0.40	<0.40	<0.1	<0.1	<2	<2	<2	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	0.2	**2**	<0.40	<0.40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	µg/L	0.5	**80**	-	-	<0.2	<0.2	<0.2	-	-	<0.5	<0.5	<0.5
Chloroethane	µg/L	3		2.1	<0.40	<0.1	<0.1	<3	-	3	<5	<5	<5
Chloroform	µg/L	0.5		<0.40	<0.40	<0.3	<0.3	<1	<1	<1	<0.5	<0.5	<0.5
Chloromethane	µg/L	2		<0.80	<0.80	<0.3	<0.3	<2	-	<2	<5	<5	<5
Dibromochloromethane	µg/L	0.5		<0.20	<0.20	<0.1	<0.1	<2	<2	<2	<0.5	<0.5	<0.5
Dibromomethane	µg/L			-	-	<1	-	-	-	-	-	-	-
Dibromoethane,1,2-	µg/L	0.2		<0.20	<0.20	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromo-3-chloropropane, 1, 2-	µg/L			-	-	<1	-	-	-	-	-	-	-
Dichlorobenzene, 1,2-	µg/L	0.5	**200**	<0.20	<0.20	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorobenzene, 1,3-	µg/L	0.5		<0.20	<0.20	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorobenzene, 1,4-	µg/L	0.5	**5**	<0.20	<0.20	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	µg/L	2		<0.60	<0.60	<1	<1	<2	<2	<2	-	-	-
Dichloroethane, 1,1-	µg/L	0.5		<0.60	<0.60	0.1	0.1	<0.5	-	<0.5	<0.5	<0.5	<0.5
Dichloroethane, 1,2-	µg/L	0.5	**5**	<0.40	<0.40	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethene, 1,1-	µg/L	0.5	**14**	<0.60	<0.60	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroethene, 1,2-cis-	µg/L	0.5		0.61	<0.40	0.1	0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5
Dichloroethene, 1,2-trans-	µg/L	0.5		<0.40	<0.40	<0.1	<0.1	<5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloromethane	µg/L	0.5	**50**	<0.40	<0.40	<0.3	<0.3	<0.5	-	<5	<0.5	<0.5	<0.5
Dichloropropane, 1,2-	µg/L	0.5		<0.40	<0.40	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloropropene, 1,1-	µg/L			-	-	<0.2	<0.2	<0.2	-	-	-	-	-
Dichloropropane, 1,3-	µg/L			-	-	<0.2	<0.1	<0.1	-	-	-	-	-
Dichloropropane, 2,2-	µg/L			-	-	<0.2	-	-	-	-	-	-	-
Dichloropropene, 1,3-	µg/L	0.5		<1[#1]	<1[#1]	<0.2[#1]	<0.2[#1]	<0.7[#1]	<1[#1]	<0.5	-	-	-
Dichloropropene, 1,3- cis	µg/L	0.5		<0.40	<0.40	<0.1	<0.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloropropene, 1,3- trans	µg/L	0.5		<0.60	<0.60	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Hexane	µg/L	5		<0.40	<0.40	<1	<1	<5	<5	<5	-	-	-
Methyl Butyl Ketone	µg/L			<0.60	<2.0	<10	-	-	-	-	-	-	-
Methyl Ethyl Ketone	µg/L	20		<2.0	<2.0	<1	<1	<20	<20	<20	-	-	-
Methyl Iso-Butyl Ketone	µg/L	20		<2.0	<2.0	<1	<1	<20	<20	<20	-	-	-
Methyl tert-butyl ether	µg/L	2		<0.40	<0.40	<1	<1	<2	<2	<2	-	-	-
Styrene	µg/L	0.5		<0.20	<0.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	µg/L	0.5	**10**	<0.40	<0.40	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,1,2-	µg/L	0.5		<0.20	<0.20	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,2,2-	µg/L	0.5		<0.20	<0.20	<0.4	<0.4	<0.5	-	<0.5	<0.5	<0.5	<0.5
Trichlorobenzene, 1,2,3-	µg/L			-	-	<0.2	-	-	-	-	-	-	-
Trichlorobenzene, 1,2,4-	µg/L			<0.60	<0.60	<0.2	-	<0.5	-	-	-	-	-
Trichloroethene	µg/L	0.5	**5**	<0.40	<0.40	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethane, 1,1,1-	µg/L	0.5		<0.60	<0.60	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethane, 1,1,2-	µg/L	0.5		<0.40	<0.40	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	µg/L	5		<0.80	<0.80	<0.1	<0.1	<5	<5	<5	<5	<5	<5
Trimethylbenzene, 1,3,5-	µg/L	0.1		-	-	<0.6	<0.6	<0.6	-	<0.1	-	-	-
Vinyl chloride	µg/L	0.2	**1**	<0.34	<0.34	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Trichloropropane, 1,2,3-	µg/L			-	-	<0.2	-	-	-	-	-	-	-

Comments
#1 ESDAT Combined.

Table 6 - Surface Water Quality

			Location Code	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2
			Date	07 May 2012	31 Jul 2012	13 Nov 2012	31 May 2013	03 Dec 2013	10 Jun 2014	11 Aug 2014	04 Nov 2014	16 Apr 2015	31 Jul 2015	28 Oct 2015	28 Apr 2016	28 Jul 2016	28 Oct 2016	06 Jun 2017	26 Jul 2017	02 Oct 2017
	Unit	EQL	PWQO																	
Aluminium	µg/L	1	15..75[#1]	23	18	20	13	13	5	6	7	7	4	8	10	11	9	30	50	**80**
Aluminium (filtered)	µg/L	1	15..75[#1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	µg/L	0.9	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	µg/L	0.1	5	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	0.4	0.3	0.6
Barium	µg/L	0.08		12	17	10	10	19	19	16	9	9	15	11	8	17	12	19	29	41
Boron	µg/L	2	200	<10	10	<10	18	<10	<10	<10	<10	<10	<10	<10	12	<10	<10	<5	13	17
Cadmium	µg/L	0.003	0.1..0.5[#2]	<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	<0.014	<0.014	0.071
Chloride	µg/L	500		13,200	24,000	14,600	21,500	26,000	22,600	19,200	18,400	24,400	22,100	24,100	20,600	23,100	37,300	26,400	9,600	50,200
Chromium (III+VI)	µg/L	0.08	1[#3]	<3	<3	<3	<3	<3	**3**	<3	<3	<3	<3	<3	<3	<3	<3	**3**	<1	<1
Cobalt	µg/L	0.004	0.9	<1	<1	<1	<0.5	**1**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5
Copper	µg/L	0.1	1..5[#2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	0.7	0.2	**9.6**
Iron	µg/L	5	300	172	**2,120**	170	290	**1,910**	**520**	**467**	270	289	**639**	234	28	**577**	**347**	298	253	**1,910**
Lead	µg/L	0.02	1..5[#2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	0.08	<0.02	0.79
Mercury (filtered)	µg/L	0.01	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	<0.1	<0.02	<0.02	<0.02
Nickel	µg/L	0.1	25	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<10	<10	<10
Phosphorus total (P2O5)	µg/L	3	30	**55**	**740**	**100**	**34**	**65**	**234**	**188**	**83**	**84**	**139**	**31**	22	**136**	**58**	30	**50**	**70**
Selenium	µg/L	0.04	100	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<1	<1	<1
Silver	µg/L	0.05	0.1	<2	<2	<2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.02	<0.02	<0.02
Strontium	µg/L	0.08		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	2	20	<5	8	10	**25**	7	<5	<5	<5	<5	6	<5	<5	<5	<5	<5	**52**	**33**
Alkalinity (total) as CaCO3	mg/L	2		113	119	72	113	159	124	120	104	68	133	100	93	107	107	118	123	149
Alkalinity (total)	mg/L	2	[#4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	1		154	214	104	184	216	198	196	140	128	208	146	138	194	206	187	155	269
Hardness as CaCO3	mg/L	0.05		112	140	83	127	174	144	143	92.4	77.2	161	107	96.4	134	123	139	150	156
Chemical Oxygen Demand	mg/L	5		28	149	55	41	37	89	59	29	17	50	41	15	37	40	32	46	78
Total Suspended Solids	mg/L	2		<10	93	<10	<10	<10	15	30	<10	12	14	<10	<10	20	15	3	6	14
Biochemical Oxygen Demand	mg/L	2		<5	18	<5	<5	<5	5	18	<5	<5	6	<5	<5	<5	<5	<2	3	6
Dissolved Organic Carbon (filtered)	mg/L	0.2		10.6	21.1	16.1	12.8	11.8	12.7	17.2	13	6.6	17.7	13.8	8.4	18.8	16	13.5	13.4	18.2
Phenols (4AAP)	mg/L	0.001	**0.001**	<0.001	<0.001	<0.001	<0.001	**0.003**	<0.001	<0.001	**0.002**	<0.001	<0.001	**0.003**	<0.001	<0.001	<0.001	**0.008**	<0.001	<0.001
Sulphate	mg/L	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		2.15	2.21	1.21	1.27	4.13	1.51	0.14	<0.10	2.36	1.79	0.82	2.94	1.29	0.46	<1	<1	<1
Ammonia as N	mg/L	0.01		<0.02	0.04	0.03	<0.02	0.17	0.05	-	0.05	-	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	0.03	0.04
Nitrate (as N)	mg/L	0.05		<0.05	0.2	<0.05	<0.05	0.21	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite (as N)	mg/L	0.03		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Kjeldahl Nitrogen	mg/L	0.1		0.72	7.7	0.63	0.96	0.73	1.39	2.09	0.62	0.68	1.95	0.94	0.34	1.57	1.17	0.5	0.9	1.2
Ammonia, Unionized	mg/L	0.001	**0.02**	<0.02	<0.02	<0.02	<0.02	<0.02	0.0027	-	0.0012	<0.02	<0.02	<0.02	<0.02	0.00033	<0.02	<0.005	<0.005	<0.005
Nitrite + Nitrate as N	mg/L	0.06		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour	CU	2		49	101	128	79	82	60	71	98	35	65	57	35	65	82	53	46	105
Turbidity (Lab)	NTU	0.1	[#5]	0.9	-	2.6	-	-	4.5	13.9	7	3.2	8.4	10.3	0.9	3.8	7.7	1.4	3.3	2.6
Electrical Conductivity (Lab)	µS/cm	1		225	259	184	300	414	324	320	242	216	339	271	226	287	321	340	281	489
pH (Lab)	-	0.05	6.5-8.5	8	7.58	7.28	7.32	7.42	7.93	7.8	7.65	7.49	7.96	7.57	7.9	7.5	8.12	7.86	7.65	7.85
DO (Field)	mg/L		5	-	-	-	-	-	-	-	-	-	-	-	11.01	10.53	9.18	9.53	12.35	**1.5**
Redox (Field)	mV			-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	145	62
Temperature (Field)	°C			-	-	-	-	-	-	-	-	-	-	-	7.3	19.5	4.9	15.5	17.5	8.6
Conductivity (field)	µS/cm			-	-	-	-	-	-	-	-	-	-	-	250	234	319	380	-	470
pH (Field)	-		6.5-8.5	-	-	-	-	-	-	-	-	-	-	-	8.45	7.56	**8.77**	7.27	7.07	7.43

Comments
#1 Depends on pH and background concentration
#2 Depends on Hardness
#3 PWQO value for Total Chromium based on more stringent Chromium VI criteria.

Table 6 - Surface Water Quality

			Location Code	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2
			Date	29 May 2018	05 Jul 2018	12 Nov 2018	16 Apr 2019	17 Jul 2019	21 Apr 2020	08 Jul 2020	12 Nov 2020	19 Apr 2021	14 Jul 2021	03 Nov 2021	16 Jun 2022	21 Jul 2022	09 Nov 2022	25 May 2023	16 Aug 2023
	Unit	EQL	PWQO																
Aluminium	µg/L	1	**15..75**[#1]	**100**	**100**	60	30	-	-	-	-	-	-	-	-	-	-	-	-
Aluminium (filtered)	µg/L	1	**15..75**[#1]	-	-	-	-	40	30	20	20	<10	20	30	6	7	5	5	**124**
Antimony	µg/L	0.9	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.9	-
Arsenic	µg/L	0.1	**5**	0.7	0.3	0.2	<0.1	0.2	0.1	0.3	0.2	0.1	0.2	0.1	0.3	1.1	<0.2	0.2	0.4
Barium	µg/L	0.08		41	52	15	8	20	10	19	12	6	13	10	10.5	22.9	10.1	11.2	30.7
Boron	µg/L	2	**200**	6	40	11	6	14	9	9	22	8	17	11	10	8	2	11	12
Cadmium	µg/L	0.003	**0.1..0.5**[#2]	0.015	0.073	0.042	0.018	<0.015	<0.015	<0.015	<0.015	0.018	<0.015	<0.015	0.012	0.006	0.021	0.003	0.004
Chloride	µg/L	500		22,300	41,400	20,900	11,100	13,600	20,400	14,300	22,300	12,900	6,400	14,700	21,000	28,000	26,000	31,000	20,000
Chromium (III+VI)	µg/L	0.08	**1**[#3]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.35	0.24	0.12	0.10	0.40
Cobalt	µg/L	0.004	**0.9**	**10**	0.6	0.4	0.1	0.3	<0.1	0.2	0.2	0.1	0.3	<0.1	0.163	0.241	0.169	-	0.582
Copper	µg/L	0.1	**1..5**[#2]	0.6	3.7	**5.6**	0.9	0.6	0.3	0.7	0.2	0.2	0.9	0.2	0.6	0.5	0.3	0.3	1.2
Iron	µg/L	5	**300**	**1,180**	195	**1,360**	203	245	200	**312**	**524**	131	**355**	239	**338**	**1,060**	155	250	**793**
Lead	µg/L	0.02	**1..5**[#2]	0.16	0.47	0.33	0.19	0.05	0.07	0.09	0.05	0.08	0.09	0.04	<0.09	0.30	<0.09	<0.09	0.26
Mercury (filtered)	µg/L	0.01	**0.2**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	0.01	<0.01
Nickel	µg/L	0.1	**25**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	0.2	0.2	0.6	0.2	0.4
Phosphorus total (P2O5)	µg/L	3	**30**	**80**	**60**	**60**	**100**	**100**	**60**	**100**	**120**	**90**	**90**	20	**64**	**187**	26	29	**64**
Selenium	µg/L	0.04	**100**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.07	0.05	0.51	0.06	0.07
Silver	µg/L	0.05	**0.1**	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Strontium	µg/L	0.08		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	2	**20**	**31**	**24**	**43**	10	<5	**24**	9	9	14	15	10	3	2	7	<2	5
Alkalinity (total) as CaCO3	mg/L	2		106	131	145	77	130	81	125	92	67	58	106	115	139	112	120	142
Alkalinity (total)	mg/L	2	[#4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	1		143	209	178	103	160	122	152	134	91	69	139	177	194	157	220	194
Hardness as CaCO3	mg/L	0.05		150	175	126	85	169	106	163	116	76	66	115	127	143	111	153	187
Chemical Oxygen Demand	mg/L	5		61	29	63	20	53	27	61	63	26	39	40	45	69	49	40	46
Total Suspended Solids	mg/L	2		36	18	16	3	10	5	12	4	10	5	3	7	10	6	5	22
Biochemical Oxygen Demand	mg/L	2		5	3	8	<3	<3	<3	<3	<3	<3	4	<3	<4	8	<4	5	<4
Dissolved Organic Carbon (filtered)	mg/L	0.2		19	11.7	4.9	8.9	14.9	9.8	22.7	20.1	11.2	18.1	20.6	14	19	16	15	15
Phenols (4AAP)	mg/L	0.001	**0.001**	<0.001	<0.001	**0.005**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	**0.003**	<0.001	**0.003**	**0.002**	**0.003**
Sulphate	mg/L	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		<1	2	<1	2	<1	3	<1	<1	<1	2	4	<2	<20	<2	<2	<2
Ammonia as N	mg/L	0.01		0.04	0.01	0.05	0.04	0.04	0.03	0.04	0.03	0.02	0.03	0.03	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate (as N)	mg/L	0.05		<0.05	0.06	<0.05	<0.05	<0.05	0.08	0.11	<0.05	<0.05	<0.05	<0.05	<0.06	<0.06	<0.06	<0.06	<0.06
Nitrite (as N)	mg/L	0.03		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	<0.03	<0.03	<0.03	<0.03
Total Kjeldahl Nitrogen	mg/L	0.1		1.1	0.5	0.8	0.7	1.1	0.7	1.5	1.3	0.4	0.9	0.7	1.0	1.6	0.5	<0.5	0.8
Ammonia, Unionized	mg/L	0.001	**0.02**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001
Nitrite + Nitrate as N	mg/L	0.06		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour	CU	2		63	52	160	43	60	38	94	150	51	105	101	73	83	81	62	60
Turbidity (Lab)	NTU	0.1	[#5]	15	6.9	18.5	1.4	1.9	0.8	4.1	1.5	1.6	1.8	0.7	2.25	2.58	1.60	0.60	4.3
Electrical Conductivity (Lab)	µS/cm	1		279	405	347	202	312	238	296	262	179	136	271	265	357	291	321	320
pH (Lab)	-	0.05	**6.5-8.5**	7.85	7.94	7.54	7.01	7.64	7.59	7.63	7.59	7.42	6.94	7.65	7.78	7.99	7.54	7.90	7.92
DO (Field)	mg/L		**5**	9.12	**4.3**	**2.41**	**3.18**	7.35	9.52	**4.68**	**3.64**	6.93	**2.67**	**4.16**	**3.59**	**1.43**	**3.3**	6.43	**4.57**
Redox (Field)	mV			7	118	136	113	118	70	160	188	149	111	59	316	260	242	-230	262
Temperature (Field)	°C			24.4	23.6	1.6	3.6	25.1	5	21.9	4.9	3.7	20.1	2.9	18.6	20.3	2.2	15.3	20.7
Conductivity (field)	µS/cm			260	470	350	190	350	310	320	188	193	136	299	330	310	237	345	324
pH (Field)	-		**6.5-8.5**	7.47	7.73	7.19	7.51	6.92	7.3	7.01	7.25	7.4	7.1	7.22	7.06	6.78	6.85	6.99	6.84

Comments
#1 Depends on pH and background concentration
#2 Depends on Hardness
#3 PWQO value for Total Chromium based on more stringent Chromium VI criteria.

Table 6 - Surface Water Quality

			Location Code	SW2	SW2	SW3	SW3	SW3	SW3	SW3	SW3	SW3	SW3	SW3	SW3	SW3	SW3	SW3
			Date	28 May 2024	05 Sep 2024	07 May 2012	13 Nov 2012	31 May 2013	03 Dec 2013	04 Nov 2014	28 Apr 2016	28 Jul 2016	28 Oct 2016	06 Jun 2017	16 Apr 2019	21 Apr 2020	19 Apr 2021	14 Jul 2021	16 Aug 2023
	Unit	EQL	PWQO															
Aluminium	µg/L	1	15..75[#1]	-	-	10	9	10	7	9	5	13	<4	60	50	-	-	-	-
Aluminium (filtered)	µg/L	1	15..75[#1]	4	6	-	-	-	-	-	-	-	-	-	-	30	20	70	**512**
Antimony	µg/L	0.9	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	µg/L	0.1	**5**	0.3	0.4	<3	<3	<3	<3	<3	<3	<3	<3	0.5	0.2	0.2	0.2	0.4	1.9
Barium	µg/L	0.08		13.8	28.1	21	31	40	912	24	24	105	84	27	21	12	13	16	185
Boron	µg/L	2	**200**	8	20	<10	22	17	21	12	12	16	13	18	8	9	11	19	25
Cadmium	µg/L	0.003	0.1..0.5[#2]	0.005	0.020	<1	<1	<0.1	**0.6**	<0.1	<0.1	<0.1	<0.1	<0.014	<0.015	<0.015	<0.015	<0.015	0.008
Chloride	µg/L	500		18,000	13,000	91,100	273,000	193,000	82,900	131,000	99,000	236,000	204,000	41,600	58,700	57,100	52,200	20,900	200,000
Chromium (III+VI)	µg/L	0.08	1[#3]	0.26	0.86	**3**	<3	<3	<3	<3	<3	**7**	<3	**2**	<1	<1	<1	<1	**1.34**
Cobalt	µg/L	0.004	**0.9**	0.280	0.687	<1	<1	**1.2**	**24.8**	0.6	<0.5	**2.7**	**1.9**	<5	0.5	0.2	0.2	0.4	**4.62**
Copper	µg/L	0.1	1..5[#2]	<1	2	<2	<2	<2	**34**	<2	<2	**6**	<2	0.5	0.8	0.4	2	0.6	3.0
Iron	µg/L	5	**300**	**357**	**1,270**	**509**	**330**	**2,190**	**39,900**	**1,510**	**1,970**	**11,900**	**17,500**	**1,130**	**459**	**606**	**624**	**484**	**39,900**
Lead	µg/L	0.02	1..5[#2]	0.17	1.22	<2	<2	<2	<2	<2	<2	3	<2	0.02	0.03	0.03	0.19	0.07	0.53
Mercury (filtered)	µg/L	0.01	**0.2**	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
Nickel	µg/L	0.1	**25**	0.3	0.8	<3	<3	<3	<3	<3	<3	<3	<3	<10	<10	<10	<10	<10	2.5
Phosphorus total (P2O5)	µg/L	3	**30**	**60**	**74**	**54**	30	**37**	**65**	**120**	**143**	**379**	**320**	**60**	**180**	**40**	**60**	**70**	**641**
Selenium	µg/L	0.04	**100**	0.05	<0.04	<4	<4	<4	<4	<4	<4	4	<4	<1	<1	<1	<1	<1	0.21
Silver	µg/L	0.05	**0.1**	<0.05	<0.05	<2	<2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.02	<0.1	<0.1	<0.1	<0.1	<0.05
Strontium	µg/L	0.08		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	2	**20**	5	6	**52**	9	10	**229**	<5	7	**22**	6	**94**	15	5	20	8	11
Alkalinity (total) as CaCO3	mg/L	2		109	-	170	235	228	221	260	140	373	377	164	125	117	143	125	410
Alkalinity (total)	mg/L	2	[#4]	-	156	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	1		163	189	392	816	692	372	470	300	792	738	266	235	213	232	154	777
Hardness as CaCO3	mg/L	0.05		110	177	205	347	333	248	236	170	436	398	198	165	164	183	132	507
Chemical Oxygen Demand	mg/L	5		41	45	18	24	27	2,380	26	25	69	64	32	25	18	20	49	59
Total Suspended Solids	mg/L	2		7	108	<10	<10	31	5,120	15	36	80	148	24	8	11	25	12	180
Biochemical Oxygen Demand	mg/L	2		<4	5	<5	<5	<5	59	<5	<5	<5	7	<2	<3	<3	<3	3	4
Dissolved Organic Carbon (filtered)	mg/L	0.2		12	13	10.2	8	9.9	9.4	8.6	8.5	27.7	20.3	14.5	8.7	7.4	8.5	17.4	9
Phenols (4AAP)	mg/L	0.001	**0.001**	<0.001	**0.003**	<0.001	<0.001	0.001	**0.014**	<0.001	<0.001	<0.001	<0.001	**0.01**	<0.002	<0.002	<0.002	<0.001	**0.004**
Sulphate	mg/L	1		<2	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		-	-	2.71	20.1	3.34	7.07	1.49	3.58	0.72	1.14	<1	3	3	1	2	<2
Ammonia as N	mg/L	0.01		<0.1	<0.1	<0.02	<0.02	<0.02	1.05	0.06	<0.02	0.2	<0.02	0.02	0.06	0.02	0.02	0.02	<0.1
Nitrate (as N)	mg/L	0.05		<0.06	<0.06	<0.05	0.12	<0.10	0.043	<0.25	<0.05	<0.25	<0.25	<0.05	<0.05	0.08	<0.05	<0.05	<0.06
Nitrite (as N)	mg/L	0.03		<0.03	<0.03	<0.05	<0.05	<0.10	<0.25	<0.25	<0.05	<0.25	<0.25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03
Total Kjeldahl Nitrogen	mg/L	0.1		0.6	0.7	0.44	0.51	0.64	29.5	0.38	0.63	1.7	0.93	0.5	1.1	0.4	0.3	0.8	1.1
Ammonia, Unionized	mg/L	0.001	**0.02**	<0.001	<0.001	<0.02	<0.02	<0.02	**0.04**	0.0046	<0.02	0.0081	0.0012	<0.005	<0.01	<0.005	<0.01	<0.01	<0.001
Nitrite + Nitrate as N	mg/L	0.06		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour	CU	2		72	77	37	26	39	35	34	33	45	23	48	30	27	31	90	34
Turbidity (Lab)	NTU	0.1	[#5]	1.1	27	1	15	-	-	9.5	26.3	81.3	87.2	5.3	2.7	2.3	0.3	15.4	250
Electrical Conductivity (Lab)	µS/cm	1		252	316	607	1,140	1,020	725	893	523	1,390	1,270	484	455	413	450	301	1,230
pH (Lab)	-	0.05	**6.5-8.5**	7.90	7.44	8.24	7.97	7.84	7.76	8.18	8.01	7.86	8.07	7.99	7.48	7.71	7.95	7.54	7.94
DO (Field)	mg/L		**5**	**2.52**	**3.73**	-	-	-	-	-	12.07	**4.78**	5.89	9	**4.24**	10.57	9.28	7.39	**1.45**
Redox (Field)	mV			64	123	-	-	-	-	-	-	-	-	98	152	54	155	120	-136
Temperature (Field)	°C			16.6	17.5	-	-	-	-	-	16.9	22.2	5	13.7	6.7	6.1	9.8	21.5	22
Conductivity (field)	µS/cm			272	267	-	-	-	-	-	895	1,097	953	550	500	480	463	336	11,848
pH (Field)	-		**6.5-8.5**	6.98	6.83	-	-	-	-	-	7.74	7.4	8.22	7.57	7.57	8.3	7.49	7.37	6.88

Comments
#1 Depends on pH and background concentration
#2 Depends on Hardness
#3 PWQO value for Total Chromium based on more stringent Chromium VI criteria.

Table 6 - Surface Water Quality

			Location Code	SW3	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4
			Date	28 May 2024	07 May 2012	31 Jul 2012	13 Nov 2012	31 May 2013	03 Dec 2013	10 Jun 2014	11 Aug 2014	04 Nov 2014	16 Apr 2015	31 Jul 2015	28 Oct 2015	28 Apr 2016	28 Jul 2016	28 Oct 2016	06 Jun 2017
	Unit	EQL	PWQO																
Aluminium	µg/L	1	**15..75**[#1]	-	9	20	8	11	<4	11	<4	<4	<4	<4	<4	<4	13	<4	40
Aluminium (filtered)	µg/L	1	**15..75**[#1]	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	µg/L	0.9	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	µg/L	0.1	**5**	0.3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	0.3
Barium	µg/L	0.08		13.9	47	34	46	30	25	29	30	25	24	29	24	24	30	22	35
Boron	µg/L	2	**200**	6	<10	<10	<10	14	<10	<10	26	<10	<10	<10	<10	12	<10	<10	19
Cadmium	µg/L	0.003	**0.1..0.5**[#2]	0.004	<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	<0.014
Chloride	µg/L	500		29,000	4,760	4,910	7,530	5,650	2,520	2,220	2,580	3,170	3,420	3,220	4,480	3,370	1,760	2,930	1,700
Chromium (III+VI)	µg/L	0.08	**1**[#3]	0.25	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	1
Cobalt	µg/L	0.004	**0.9**	0.207	<1	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Copper	µg/L	0.1	**1..5**[#2]	<1	<2	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	0.3
Iron	µg/L	5	**300**	**555**	0	**1,440**	24	18	<10	<10	**410**	<10	<10	46	20	<10	34	<10	41
Lead	µg/L	0.02	**1..5**[#2]	<0.09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	0.04
Mercury (filtered)	µg/L	0.01	**0.2**	<0.01	<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	<0.02
Nickel	µg/L	0.1	**25**	0.4	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<10
Phosphorus total (P2O5)	µg/L	3	**30**	29	25	**210**	<20	8	7	12	15	**49**	11	15	12	11	6	<6	10
Selenium	µg/L	0.04	**100**	0.05	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<1
Silver	µg/L	0.05	**0.1**	<0.05	<2	<2	<2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.02
Strontium	µg/L	0.08		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	2	**20**	7	<5	9	<5	10	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	**50**
Alkalinity (total) as CaCO3	mg/L	2		140	157	92	125	120	136	128	187	122	108	125	100	104	130	115	119
Alkalinity (total)	mg/L	2	[#4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	1		197	186	124	212	180	146	154	212	148	152	162	122	128	126	138	134
Hardness as CaCO3	mg/L	0.05		138	163	73	165	130	146	136	191	122	114	138	122	106	135	112	131
Chemical Oxygen Demand	mg/L	5		37	7	49	24	16	12	25	6	27	10	23	20	5	15	17	12
Total Suspended Solids	mg/L	2		6	<10	103	<10	<10	<10	<10	10	<10	<10	<10	<10	<10	<10	<10	3
Biochemical Oxygen Demand	mg/L	2		<4	<5	7	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<2
Dissolved Organic Carbon (filtered)	mg/L	0.2		11	5.1	5.5	8.4	6.2	5.3	6.3	3.7	6.6	4.2	9.7	9.6	5.7	11.5	9.1	6.9
Phenols (4AAP)	mg/L	0.001	**0.001**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	**0.007**
Sulphate	mg/L	1		<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		-	6.82	17.1	38	10.8	7.26	3.19	4.99	5.74	6.96	2.72	11.1	7.28	1.46	3.79	3
Ammonia as N	mg/L	0.01		<0.1	<0.02	0.22	<0.02	<0.02	0.04	0.04	-	0.04	-	<0.02	0.07	<0.02	<0.02	<0.02	<0.01
Nitrate (as N)	mg/L	0.05		<0.06	<0.05	0.32	<0.05	<0.10	0.08	<0.05	<0.05	<0.05	0.15	<0.05	0.08	<0.05	<0.05	<0.05	<0.05
Nitrite (as N)	mg/L	0.03		<0.03	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Kjeldahl Nitrogen	mg/L	0.1		0.9	0.18	1.95	0.35	0.64	0.12	0.5	<0.10	0.2	0.16	0.44	0.46	0.22	0.53	0.4	0.3
Ammonia, Unionized	mg/L	0.001	**0.02**	<0.001	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0014	0.0018	-	<0.02	0.0014	<0.02	0.0002	-	<0.005
Nitrite + Nitrate as N	mg/L	0.06		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour	CU	2		63	26	37	37	44	22	40	18	42	21	61	47	28	74	49	33
Turbidity (Lab)	NTU	0.1	[#5]	1.3	<0.5	-	1.9	-	-	0.8	1.7	0.7	<0.5	1.6	0.7	0.6	<0.5	0.8	0.5
Electrical Conductivity (Lab)	µS/cm	1		338	307	239	309	258	289	252	404	258	239	260	227	212	256	233	244
pH (Lab)	-	0.05	**6.5-8.5**	8.01	8.09	7.81	8	7.67	7.92	8.09	8.02	7.93	7.92	8.06	7.53	7.53	7.64	7.99	8.07
DO (Field)	mg/L		**5**	7.44	-	-	-	-	-	-	-	-	-	-	-	10.41	6.82	10.72	9.17
Redox (Field)	mV			69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
Temperature (Field)	°C			16.0	-	-	-	-	-	-	-	-	-	-	-	10.4	18.8	5.4	15.2
Conductivity (field)	µS/cm			364	-	-	-	-	-	-	-	-	-	-	-	235	214	399	260
pH (Field)	-		**6.5-8.5**	7.46	-	-	-	-	-	-	-	-	-	-	-	8.33	8.01	**8.52**	7.64

Comments
#1 Depends on pH and background concentration
#2 Depends on Hardness
#3 PWQO value for Total Chromium based on more stringent Chromium VI criteria.

Table 6 - Surface Water Quality

			Location Code	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4	SW4
			Date	26 Jul 2017	02 Oct 2017	29 May 2018	25 Jul 2018	12 Nov 2018	16 Apr 2019	17 Jul 2019	21 Apr 2020	08 Jul 2020	12 Nov 2020	19 Apr 2021	14 Jul 2021	03 Nov 2021	16 Jun 2022	21 Jul 2022	09 Nov 2022
	Unit	EQL	PWQO																
Aluminium	µg/L	1	**15..75**[#1]	20	30	50	30	40	20	-	-	-	-	-	-	-	-	-	-
Aluminium (filtered)	µg/L	1	**15..75**[#1]	-	-	-	-	-	-	30	30	30	40	<10	50	30	3	3	2
Antimony	µg/L	0.9	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	µg/L	0.1	**5**	0.3	0.3	0.7	0.3	0.2	0.2	0.4	0.2	0.6	0.3	0.2	0.4	0.2	0.3	0.6	<0.2
Barium	µg/L	0.08		30	27	40	40	26	21	31	23	33	32	26	27	27	29.1	38.4	26.6
Boron	µg/L	2	**200**	7	8	<5	19	5	<5	9	7	11	10	7	10	5	9	10	4
Cadmium	µg/L	0.003	**0.1..0.5**[#2]	<0.014	<0.014	<0.015	0.063	<0.015	0.016	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.010	0.008	<0.003
Chloride	µg/L	500		2,100	3,400	1,600	2,100	3,100	2,600	2,300	3,300	2,100	3,400	2,800	4,200	3,300	4,000	3,000	4,000
Chromium (III+VI)	µg/L	0.08	**1**[#3]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.27	0.17	<0.08
Cobalt	µg/L	0.004	**0.9**	<5	<5	<5	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.039	0.065	0.021
Copper	µg/L	0.1	**1..5**[#2]	0.3	<0.1	0.2	2.1	0.4	0.8	0.2	0.4	0.6	0.5	0.3	0.5	0.3	0.4	0.3	0.3
Iron	µg/L	5	**300**	40	51	66	101	27	39	97	24	148	78	44	101	153	61	85	24
Lead	µg/L	0.02	**1..5**[#2]	<0.02	<0.02	0.04	0.33	0.03	0.16	0.04	0.04	0.09	<0.02	0.02	0.07	0.03	<0.09	<0.09	<0.09
Mercury (filtered)	µg/L	0.01	**0.2**	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
Nickel	µg/L	0.1	**25**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	0.2	0.2	0.5
Phosphorus total (P2O5)	µg/L	3	**30**	10	<10	<10	20	10	<10	20	<10	20	<10	**60**	**40**	<10	21	22	9
Selenium	µg/L	0.04	**100**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.09	0.07	0.05
Silver	µg/L	0.05	**0.1**	<0.02	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05
Strontium	µg/L	0.08		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	2	**20**	<5	<5	**30**	18	13	10	8	5	<5	10	13	8	17	2	<2	<2
Alkalinity (total) as CaCO3	mg/L	2		130	134	117	107	122	92	128	123	139	129	115	110	139	111	143	138
Alkalinity (total)	mg/L	2	[#4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	1		146	152	116	118	128	104	133	111	145	139	122	110	137	146	154	163
Hardness as CaCO3	mg/L	0.05		125	132	136	127	129	95	146	120	159	149	125	113	139	122	148	125
Chemical Oxygen Demand	mg/L	5		24	26	18	24	16	5	20	13	25	22	10	24	11	15	26	10
Total Suspended Solids	mg/L	2		<3	4	<3	<3	5	3	<3	<3	<3	<3	3	5	<3	2	<2	2
Biochemical Oxygen Demand	mg/L	2		2	<2	<2	<2	5	<3	<3	<3	<3	<3	<3	<3	<3	<4	<4	<4
Dissolved Organic Carbon (filtered)	mg/L	0.2		7.9	8.6	8.3	11.1	9.5	4.6	9.2	4.9	10.9	8.2	5.9	10.7	8.9	6	9	8
Phenols (4AAP)	mg/L	0.001	**0.001**	<0.001	**0.004**	<0.001	**0.002**	**0.002**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	**0.002**	**0.004**
Sulphate	mg/L	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		2	2	2	3	6	5	<1	5	1	5	5	3	2	<2	<2	<2
Ammonia as N	mg/L	0.01		0.02	0.03	0.02	0.01	0.03	0.03	0.06	0.02	0.05	0.02	0.01	0.02	0.02	<0.1	<0.1	<0.1
Nitrate (as N)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05	0.1	<0.05	0.08	0.12	<0.05	<0.05	0.05	<0.05	<0.06	<0.06	<0.06
Nitrite (as N)	mg/L	0.03		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	<0.03	<0.03
Total Kjeldahl Nitrogen	mg/L	0.1		0.4	0.4	0.4	0.5	0.4	0.3	0.4	0.2	0.5	0.4	0.3	0.5	0.3	<0.5	0.6	<0.5
Ammonia, Unionized	mg/L	0.001	**0.02**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.001	<0.001	<0.001
Nitrite + Nitrate as N	mg/L	0.06		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour	CU	2		42	38	38	56	30	17	49	18	48	35	26	54	31	40	39	28
Turbidity (Lab)	NTU	0.1	[#5]	0.6	0.9	0.9	1.5	0.4	0.5	0.5	0.4	1.6	2.4	0.6	0.7	0.4	0.24	0.50	0.45
Electrical Conductivity (Lab)	µS/cm	1		265	276	227	231	250	205	260	218	283	272	238	216	268	233	289	282
pH (Lab)	-	0.05	**6.5-8.5**	7.92	8.2	8.08	7.9	7.86	7.79	7.97	7.69	7.91	7.94	7.88	7.25	8.05	7.94	8.22	7.78
DO (Field)	mg/L		**5**	7.64	9.77	7.52	6.3	10.21	9.22	8.16	9.99	6.22	9.45	10.31	6.31	11.17	6.1	6.7	11.42
Redox (Field)	mV			152	148	68	106	125	135	117	61	173	248	171	140	170	351	330	273
Temperature (Field)	°C			18.1	7.8	23.3	22.2	2.5	5.3	22.6	5.5	21.3	7.2	8.6	20.4	5.1	20.4	20.7	3.5
Conductivity (field)	µS/cm			260	300	240	270	310	220	320	320	320	207	373	226	260	275	250	220
pH (Field)	-		**6.5-8.5**	7.27	8.08	7.86	7.62	8.08	7.93	7.25	7.77	7.25	7.75	7.66	7.2	7.87	7.15	7.36	7.33

Comments
#1 Depends on pH and background concentration
#2 Depends on Hardness
#3 PWQO value for Total Chromium based on more stringent Chromium VI criteria.

Table 6 - Surface Water Quality

			Location Code	SW4	SW4	SW4	SW4	SW4	SW4	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5
			Date	25 May 2023	16 Aug 2023	21 Nov 2023	28 May 2024	05 Sep 2024	13 Nov 2024	07 May 2012	31 Jul 2012	13 Nov 2012	31 May 2013	03 Dec 2013	01 Jun 2014	11 Aug 2014	04 Nov 2014	16 Apr 2015	31 Jul 2015
	Unit	EQL	PWQO																
Aluminium	µg/L	1	**15..75**[#1]	-	-	-	-	-	-	6	18	7	10	<4	<40	<4	<4	<4	<4
Aluminium (filtered)	µg/L	1	**15..75**[#1]	3	19	2	3	3	2	-	-	-	-	-	-	-	-	-	-
Antimony	µg/L	0.9	**20**	<0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	µg/L	0.1	**5**	0.2	0.3	<0.2	0.3	<0.2	<0.2	<3	<3	<3	<3	<3	<30	<3	<3	<3	<3
Barium	µg/L	0.08		29.5	28.7	25.9	25.3	27.9	24.6	32	90	22	30	23	32	43	22	22	35
Boron	µg/L	2	**200**	7	13	5	8	9	5	<10	<10	<10	13	<10	28	<10	<10	<10	<10
Cadmium	µg/L	0.003	**0.1..0.5**[#2]	0.003	0.006	0.003	0.006	<0.003	<0.003	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	µg/L	500		2,000	3,000	4,000	1,000	3,000	3,000	4,150	3,170	5,090	3,620	3,140	2,920	2,780	4,540	4,110	3,420
Chromium (III+VI)	µg/L	0.08	**1**[#3]	0.12	0.19	0.17	0.22	0.10	0.17	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Cobalt	µg/L	0.004	**0.9**	-	0.046	0.026	0.035	0.033	0.031	<1	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper	µg/L	0.1	**1..5**[#2]	0.4	0.5	0.5	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Iron	µg/L	5	**300**	43	112	33	62	49	46	28	**7,220**	0	51	<10	64	183	<10	<10	177
Lead	µg/L	0.02	**1..5**[#2]	<0.09	<0.09	<0.09	<0.09	<0.09	0.09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Mercury (filtered)	µg/L	0.01	**0.2**	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1
Nickel	µg/L	0.1	**25**	0.2	0.3	0.2	0.2	0.1	<0.1	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Phosphorus total (P2O5)	µg/L	3	**30**	11	23	8	12	10	7	28	**320**	<20	6	13	14	19	29	18	27
Selenium	µg/L	0.04	**100**	0.04	0.07	<0.04	0.06	0.06	0.05	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Silver	µg/L	0.05	**0.1**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<2	<2	<2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Strontium	µg/L	0.08		-	-	170	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	2	**20**	<2	3	<2	<2	<2	<2	<5	6	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (total) as CaCO3	mg/L	2		121	126	123	111	-	124	127	140	95	125	138	135	155	116	105	157
Alkalinity (total)	mg/L	2	[#4]	-	-	-	-	120	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	1		149	171	140	143	129	137	142	192	156	126	140	192	192	130	140	188
Hardness as CaCO3	mg/L	0.05		135	143	129	108	119	121	130	145	118	137	148	140	166	118	110	166
Chemical Oxygen Demand	mg/L	5		12	22	11	20	18	17	22	65	30	24	14	20	19	26	<5	27
Total Suspended Solids	mg/L	2		4	9	<2	3	<2	<2	<10	143	<10	<10	<10	<10	<10	<10	<10	<10
Biochemical Oxygen Demand	mg/L	2		<4	<4	<4	<4	<4	<4	<5	6	<5	<5	<5	<5	<5	<5	<5	<5
Dissolved Organic Carbon (filtered)	mg/L	0.2		6	19	7	6	7	7	6.3	10.6	9	6.9	5.9	6.8	8.8	6.3	4.3	11
Phenols (4AAP)	mg/L	0.001	**0.001**	**0.002**	0.001	<0.001	<0.001	<0.001	**0.002**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	mg/L	1		-	-	-	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		<2	<2	3	-	-	-	5.07	2.05	23.3	4.14	7.57	1.15	0.66	5.28	6.47	0.52
Ammonia as N	mg/L	0.01		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.02	0.06	<0.02	<0.02	0.03	-	-	0.02	-	<0.02
Nitrate (as N)	mg/L	0.05		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05
Nitrite (as N)	mg/L	0.03		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Kjeldahl Nitrogen	mg/L	0.1		<0.5	<0.5	0.7	0.6	<0.5	<0.5	0.47	3.2	0.8	0.82	0.14	0.56	0.28	0.2	0.14	0.45
Ammonia, Unionized	mg/L	0.001	**0.02**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0019	0.00095	-	<0.02
Nitrite + Nitrate as N	mg/L	0.06		-	-	<0.06	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour	CU	2		27	48	30	43	42	30	37	64	47	51	20	42	50	34	22	60
Turbidity (Lab)	NTU	0.1	[#5]	0.30	2.0	0.40	0.70	0.35	0.50	<0.5	-	0.9	-	-	<0.5	<0.5	<0.5	0.8	1.2
Electrical Conductivity (Lab)	µS/cm	1		240	248	259	220	239	256	253	261	232	265	298	274	320	253	233	315
pH (Lab)	-	0.05	**6.5-8.5**	7.96	8.06	7.90	8.01	7.67	7.60	8.14	7.74	7.96	7.76	7.86	8.1	8.01	7.96	7.67	8.03
DO (Field)	mg/L		**5**	8	7.99	14.09	7.45	8.17	11.36	-	-	-	-	-	-	-	-	-	-
Redox (Field)	mV			-222	178	224	178	178	44	-	-	-	-	-	-	-	-	-	-
Temperature (Field)	°C			14.7	18.8	0.1	17.1	17.2	3.3	-	-	-	-	-	-	-	-	-	-
Conductivity (field)	µS/cm			256	270	240	235	2	146	-	-	-	-	-	-	-	-	-	-
pH (Field)	-		**6.5-8.5**	7.37	6.87	6.65	7.48	**6.1**	7.52	-	-	-	-	-	-	-	-	-	-

Comments
#1 Depends on pH and background concentration
#2 Depends on Hardness
#3 PWQO value for Total Chromium based on more stringent Chromium VI criteria.

Table 6 - Surface Water Quality

			Location Code	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5
			Date	28 Oct 2015	28 Apr 2016	28 Jul 2016	28 Oct 2016	06 Jun 2017	26 Jul 2017	02 Oct 2017	29 May 2018	25 Jul 2018	12 Nov 2018	16 Apr 2019	17 Jul 2019	21 Apr 2020	08 Jul 2020	12 Nov 2020	19 Apr 2021	14 Jul 2021
	Unit	EQL	PWQO																	
Aluminium	µg/L	1	**15..75**[#1]	<4	<4	10	<4	30	20	30	40	30	30	30	-	-	-	-	-	-
Aluminium (filtered)	µg/L	1	**15..75**[#1]	-	-	-	-	-	-	-	-	-	-	-	40	30	20	40	<10	40
Antimony	µg/L	0.9	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	µg/L	0.1	**5**	<3	<3	<3	<3	0.3	0.4	0.4	0.5	0.4	0.1	0.2	0.7	0.1	0.9	0.2	0.2	0.4
Barium	µg/L	0.08		23	24	39	22	34	33	30	33	45	18	22	44	23	51	26	24	27
Boron	µg/L	2	**200**	<10	16	<10	<10	18	5	8	<5	22	<5	<5	8	6	10	7	6	14
Cadmium	µg/L	0.003	**0.1..0.5**[#2]	<0.1	<0.1	<0.1	<0.1	<0.014	<0.014	<0.014	<0.015	0.077	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chloride	µg/L	500		7,470	4,150	2,480	5,000	2,100	2,300	5,700	2,200	3,200	4,000	3,700	2,900	4,100	2,500	4,100	3,600	5,400
Chromium (III+VI)	µg/L	0.08	**1**[#3]	<3	<3	<3	<3	**2**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cobalt	µg/L	0.004	**0.9**	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.1	<0.1	0.1	0.1	<0.1	0.2	<0.1	<0.1	0.1
Copper	µg/L	0.1	**1..5**[#2]	<2	<2	<2	<2	0.2	<0.1	<0.1	0.1	2.8	0.2	0.3	0.1	0.3	0.5	0.2	0.5	0.3
Iron	µg/L	5	**300**	227	<10	139	<10	42	141	179	91	173	18	53	**428**	33	**884**	54	46	119
Lead	µg/L	0.02	**1..5**[#2]	<2	<2	<2	<2	<0.02	<0.02	<0.02	0.02	1.12	<0.02	<0.02	0.05	<0.02	0.08	<0.02	0.03	0.02
Mercury (filtered)	µg/L	0.01	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.02	<0.02	<0.02	<0.02	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	µg/L	0.1	**25**	<3	<3	<3	<3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Phosphorus total (P2O5)	µg/L	3	**30**	24	8	**33**	7	10	10	<10	<10	20	<10	<10	30	<10	**50**	<10	**60**	**50**
Selenium	µg/L	0.04	**100**	<4	<4	<4	<4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver	µg/L	0.05	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.02	<0.02	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Strontium	µg/L	0.08		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	2	**20**	<5	<5	<5	<5	**54**	<5	10	<5	**33**	15	10	7	9	<5	11	13	**21**
Alkalinity (total) as CaCO3	mg/L	2		112	116	149	123	123	141	147	123	113	111	91	147	98	159	122	115	108
Alkalinity (total)	mg/L	2	[#4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	1		130	124	160	152	141	160	172	131	126	120	107	153	112	164	137	125	109
Hardness as CaCO3	mg/L	0.05		115	108	151	120	132	138	140	127	138	108	100	170	115	169	148	118	113
Chemical Oxygen Demand	mg/L	5		31	9	18	18	19	23	29	23	29	19	13	23	11	30	5	10	22
Total Suspended Solids	mg/L	2		<10	<10	22	<10	<3	<3	3	<3	<3	5	<3	<3	<3	12	<3	<3	<3
Biochemical Oxygen Demand	mg/L	2		<5	<5	<5	<5	<2	<2	<2	<2	<2	5	<3	<3	<3	3	<3	<3	<3
Dissolved Organic Carbon (filtered)	mg/L	0.2		10.3	5.3	11.4	9.8	7.1	9.1	10.4	9.3	13.9	8.9	5	11.2	5.3	13.3	7.1	7.3	12.9
Phenols (4AAP)	mg/L	0.001	**0.001**	0.001	<0.001	<0.001	<0.001	**0.006**	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001
Sulphate	mg/L	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		4.47	6.72	1.22	3.15	2	1	1	<1	3	6	4	<1	6	1	5	5	2
Ammonia as N	mg/L	0.01		<0.02	<0.02	<0.02	<0.02	<0.01	0.02	0.03	0.02	0.01	0.03	0.03	0.05	0.01	0.06	0.03	0.01	0.02
Nitrate (as N)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.27	<0.05	<0.05	<0.05	<0.05	0.06	0.1	<0.05	<0.05	<0.05
Nitrite (as N)	mg/L	0.03		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Kjeldahl Nitrogen	mg/L	0.1		0.54	0.2	0.57	0.36	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.5	0.2	0.6	0.3	0.2	0.6
Ammonia, Unionized	mg/L	0.001	**0.02**	<0.02	<0.02	<0.02	<0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01
Nitrite + Nitrate as N	mg/L	0.06		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour	CU	2		44	27	61	43	33	43	40	42	64	24	18	52	17	48	29	22	65
Turbidity (Lab)	NTU	0.1	[#5]	<0.5	883	4.9	1.8	0.3	0.6	0.5	0.7	1	0.3	0.5	1	0.4	2.2	0.4	1.1	0.5
Electrical Conductivity (Lab)	µS/cm	1		237	211	294	256	257	291	312	257	246	235	209	298	219	320	268	244	213
pH (Lab)	-	0.05	**6.5-8.5**	7.59	7.95	7.83	7.98	8.02	7.73	7.9	7.96	7.76	7.69	7.84	7.86	7.76	7.84	7.89	7.99	7.18
DO (Field)	mg/L		**5**	-	10.28	5.69	8.49	7.5	**4.82**	**3.95**	**4.18**	**4.4**	9.99	10.21	**4.75**	11	**3.32**	6.8	7.7	**4.16**
Redox (Field)	mV			-	-	-	-	84	148	154	73	97	270	150	121	69	192	266	206	162
Temperature (Field)	°C			-	4	15.6	5.2	14.3	17.2	8.5	21.7	20.9	1.2	3.4	21.1	4.8	21.3	6.4	8.5	19.9
Conductivity (field)	µS/cm			-	235	253	239	280	-	330	240	280	130	240	370	260	390	189	242	223
pH (Field)	-		**6.5-8.5**	-	8.3	7.71	8.42	7.44	7.45	7.27	7.48	7.65	7.34	7.5	6.95	8.17	6.95	7.33	7.53	7.11

Comments
#1 Depends on pH and background concentration
#2 Depends on Hardness
#3 PWQO value for Total Chromium based on more stringent Chromium VI criteria.

Table 6 - Surface Water Quality

			Location Code	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW5	SW6	SW6	SW6	SW6	SW6	SW6
			Date	03 Nov 2021	16 Jun 2022	21 Jul 2022	09 Nov 2022	25 May 2023	16 Aug 2023	21 Nov 2023	28 May 2024	05 Sep 2024	13 Nov 2024	03 Dec 2013	01 Jun 2014	04 Nov 2014	28 Apr 2016	28 Jul 2016	28 Oct 2016
	Unit	EQL	PWQO																
Aluminium	µg/L	1	**15..75**[#1]	-	-	-	-	-	-	-	-	-	-	7	6	5	5	13	<4
Aluminium (filtered)	µg/L	1	**15..75**[#1]	30	3	2	<1	3	9	2	2	2	6	-	-	-	-	-	-
Antimony	µg/L	0.9	**20**	-	-	-	-	<0.9	-	-	-	-	-	-	-	-	-	-	-
Arsenic	µg/L	0.1	**5**	0.2	0.3	0.9	<0.2	0.2	0.6	<0.2	0.3	0.4	0.3	<3	<3	<3	<3	<3	<3
Barium	µg/L	0.08		24	31.6	56.8	22.4	31.7	36.1	26.1	26.2	30.6	19.3	20	16	17	11	25	13
Boron	µg/L	2	**200**	<5	10	11	4	8	13	5	9	7	7	11	14	12	15	15	15
Cadmium	µg/L	0.003	**0.1..0.5**[#2]	<0.015	0.008	0.013	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.005	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloride	µg/L	500		4,100	4,000	5,000	6,000	3,000	5,000	7,000	3,000	4,000	4,000	7,310	6,150	15,300	10,300	4,660	9,930
Chromium (III+VI)	µg/L	0.08	**1**[#3]	<1	0.13	0.33	<0.08	<0.08	0.40	0.13	0.12	0.14	0.60	<3	<3	<3	<3	<3	<3
Cobalt	µg/L	0.004	**0.9**	<0.1	0.033	0.204	0.023	-	0.102	0.055	0.026	0.034	0.310	0.8	<0.5	<0.5	<0.5	0.5	<0.5
Copper	µg/L	0.1	**1..5**[#2]	0.3	<0.2	0.6	0.3	0.3	0.8	1.3	<1	<1	<1	4	2	<2	<2	2	<2
Iron	µg/L	5	**300**	33	45	**671**	41	30	**467**	95	57	111	**1,340**	**322**	194	266	<10	**533**	<10
Lead	µg/L	0.02	**1..5**[#2]	0.03	<0.09	0.31	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	0.13	<2	<2	<2	<2	<2	<2
Mercury (filtered)	µg/L	0.01	**0.2**	<0.02	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	µg/L	0.1	**25**	<10	0.1	0.4	0.5	0.2	<0.1	0.3	0.2	0.2	0.6	<3	<3	<3	<3	<3	<3
Phosphorus total (P2O5)	µg/L	3	**30**	<10	12	**41**	6	6	28	5	7	10	21	**54**	**77**	**109**	18	**76**	7
Selenium	µg/L	0.04	**100**	<1	0.04	0.09	0.07	0.05	0.09	0.05	0.05	0.04	0.05	<4	<4	<4	<4	<4	<4
Silver	µg/L	0.05	**0.1**	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Strontium	µg/L	0.08		-	-	-	-	-	-	162	-	-	-	-	-	-	-	-	-
Zinc	µg/L	2	**20**	8	3	7	<2	<2	4	<2	2	<2	<2	<5	<5	<5	<5	5	<5
Alkalinity (total) as CaCO3	mg/L	2		133	119	161	133	123	143	125	119	-	60	171	171	199	130	210	184
Alkalinity (total)	mg/L	2	[#4]	-	-	-	-	-	-	-	-	141	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	1		134	169	186	163	151	194	131	154	146	74	177	198	244	164	238	220
Hardness as CaCO3	mg/L	0.05		131	128	164	119	144	162	135	108	135	62.3	177	176	191	131	195	181
Chemical Oxygen Demand	mg/L	5		6	14	38	<8	19	25	17	24	25	32	27	37	23	13	73	13
Total Suspended Solids	mg/L	2		<3	2	16	<2	2	5	<2	<2	2	11	12	80	57	<10	320	<10
Biochemical Oxygen Demand	mg/L	2		<3	<4	<4	<4	<4	<4	<4	<4	<4	7	<5	<5	<5	<5	<5	<5
Dissolved Organic Carbon (filtered)	mg/L	0.2		7.7	7	8	7	6	10	6	7	7	12	5.4	5.7	4.9	6	10.8	6.6
Phenols (4AAP)	mg/L	0.001	**0.001**	<0.001	<0.001	**0.002**	**0.002**	0.001	**0.002**	<0.001	<0.001	<0.001	**0.003**	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Sulphate	mg/L	1		-	-	-	-	-	-	-	<2	<2	<2	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		2	<2	<2	<2	<2	<2	7	-	-	-	7.07	4.48	5.94	5.57	1.06	5.02
Ammonia as N	mg/L	0.01		0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.36	0.05	0.03	<0.02	<0.02	<0.02
Nitrate (as N)	mg/L	0.05		<0.05	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite (as N)	mg/L	0.03		<0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Kjeldahl Nitrogen	mg/L	0.1		0.3	0.6	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.8	0.84	0.85	0.5	0.19	0.87	0.23
Ammonia, Unionized	mg/L	0.001	**0.02**	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.03**	0.004	0.0021	<0.02	<0.02	<0.02
Nitrite + Nitrate as N	mg/L	0.06		-	-	-	-	-	-	<0.06	-	-	-	-	-	-	-	-	-
Colour	CU	2		25	34	35	22	25	45	26	46	39	53	18	18	18	23	26	19
Turbidity (Lab)	NTU	0.1	[#5]	0.3	0.21	1.47	0.25	0.15	1.6	0.20	0.35	0.50	6.1	-	3.7	21.3	2.1	53.9	<0.5
Electrical Conductivity (Lab)	µS/cm	1		262	242	330	277	246	282	266	232	276	139	371	363	436	269	417	382
pH (Lab)	-	0.05	**6.5-8.5**	8.01	7.97	8.14	7.74	7.88	7.90	7.79	7.96	7.34	7.30	8.11	8.13	8.14	8.16	7.99	8.28
DO (Field)	mg/L		**5**	10.87	5.87	**4.53**	8.5	7.67	**3.29**	9.81	6.48	**4.49**	11.1	-	-	-	12.52	6.06	11.25
Redox (Field)	mV			178	284	337	231	-243	237	255	76	103	40	-	-	-	-	-	-
Temperature (Field)	°C			4.2	18.2	20.3	4.3	16.5	21.3	2.6	17.0	17.9	5.5	-	-	-	4	15.6	5.2
Conductivity (field)	µS/cm			247	277	280	213	260	276	253	242	231	76	-	-	-	293	334	370
pH (Field)	-		**6.5-8.5**	7.71	7.19	7.27	**6.39**	7.53	6.81	**5.89**	7.56	6.78	7.45	-	-	-	**8.55**	7.22	**8.75**

Comments
#1 Depends on pH and background concentration
#2 Depends on Hardness
#3 PWQO value for Total Chromium based on more stringent Chromium VI criteria.

Table 6 - Surface Water Quality

			Location Code	SW6	SW6	SW6	SW6	SW6	SW6	SW6	SW6	SW6	SW6	SW6	SW6	SW6	SW6	SW6	SW6
			Date	06 Jun 2017	26 Jul 2017	02 Oct 2017	29 May 2018	25 Jul 2018	12 Nov 2018	16 Apr 2019	17 Jul 2019	21 Apr 2020	19 Apr 2021	14 Jul 2021	03 Nov 2021	16 Jun 2022	21 Jul 2022	09 Nov 2022	25 May 2023
	Unit	EQL	PWQO																
Aluminium	µg/L	1	**15..75**[#1]	70	40	70	60	**620**	60	40	-	-	-	-	-	-	-	-	-
Aluminium (filtered)	µg/L	1	**15..75**[#1]	-	-	-	-	-	-	-	70	30	<10	50	50	6	6	3	7
Antimony	µg/L	0.9	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.9
Arsenic	µg/L	0.1	**5**	0.4	0.5	0.6	0.7	1.3	0.3	0.3	0.6	0.2	0.3	0.6	0.6	0.4	0.7	<0.2	0.3
Barium	µg/L	0.08		18	15	26	15	36	14	11	19	12	12	11	16	18.0	20.2	12.6	16.1
Boron	µg/L	2	**200**	21	14	15	9	33	10	7	20	13	10	21	10	20	24	11	18
Cadmium	µg/L	0.003	**0.1..0.5**[#2]	<0.014	<0.014	<0.014	0.017	0.103	<0.015	0.018	0.016	<0.015	<0.015	<0.015	<0.015	0.021	0.009	<0.003	0.004
Chloride	µg/L	500		7,100	6,000	7,700	8,500	4,900	14,300	14,200	5,300	9,600	9,900	9,600	22,900	12,000	11,000	16,000	8,000
Chromium (III+VI)	µg/L	0.08	**1**[#3]	**2**	**11**	<1	<1	**2**	<1	<1	<1	<1	<1	<1	<1	**2.76**	0.35	<0.08	0.19
Cobalt	µg/L	0.004	**0.9**	<5	<5	<5	**14**	0.8	0.2	0.1	0.2	<0.1	<0.1	0.2	0.3	0.247	0.186	0.039	-
Copper	µg/L	0.1	**1..5**[#2]	1	0.8	0.5	1	**5.6**	1	1.4	1.5	0.9	0.9	1.1	1.3	1.6	1.3	0.6	1.2
Iron	µg/L	5	**300**	53	54	248	33	**1,010**	111	95	216	37	78	55	**535**	**348**	299	21	115
Lead	µg/L	0.02	**1..5**[#2]	0.03	0.02	0.03	<0.02	1.1	0.04	0.13	0.13	0.03	0.05	0.03	0.17	0.18	0.14	<0.09	<0.09
Mercury (filtered)	µg/L	0.01	**0.2**	<0.02	<0.02	<0.02	<0.02	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01
Nickel	µg/L	0.1	**25**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	0.7	0.6	0.7	0.4
Phosphorus total (P2O5)	µg/L	3	**30**	30	10	20	20	**210**	10	20	30	<10	**60**	**40**	20	16	17	4	8
Selenium	µg/L	0.04	**100**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.08	0.09	0.05	0.06
Silver	µg/L	0.05	**0.1**	<0.02	<0.02	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05
Strontium	µg/L	0.08		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	2	**20**	**39**	<5	**25**	6	**25**	**23**	7	5	9	20	18	8	11	<2	4	<2
Alkalinity (total) as CaCO3	mg/L	2		149	181	195	164	194	162	106	196	121	146	133	183	178	209	191	160
Alkalinity (total)	mg/L	2	[#4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	1		175	208	226	177	210	182	141	207	145	166	141	198	240	263	226	214
Hardness as CaCO3	mg/L	0.05		155	181	209	160	210	176	124	212	141	150	138	189	187	211	181	179
Chemical Oxygen Demand	mg/L	5		16	14	16	25	23	19	11	29	11	16	27	14	13	30	31	15
Total Suspended Solids	mg/L	2		4	6	13	7	70	52	9	12	6	6	<3	24	3	13	4	5
Biochemical Oxygen Demand	mg/L	2		<2	<2	<2	<2	<2	4	<3	<3	<3	<3	<3	<3	<4	<4	<4	4
Dissolved Organic Carbon (filtered)	mg/L	0.2		7.8	6.4	7.1	7.3	9.8	8.7	5.6	7.9	5.9	7	15.7	7.9	6	7	5	5
Phenols (4AAP)	mg/L	0.001	**0.001**	**0.004**	<0.001	<0.001	<0.001	0.001	**0.005**	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Sulphate	mg/L	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (filtered)	mg/L	1		2	3	2	3	1	5	4	1	6	6	3	<1	<2	<2	6	7
Ammonia as N	mg/L	0.01		<0.01	0.08	0.03	0.02	0.02	0.03	0.03	0.03	0.01	0.01	0.01	0.02	<0.1	<0.1	<0.1	<0.1
Nitrate (as N)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.06	<0.06	<0.06	<0.06
Nitrite (as N)	mg/L	0.03		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	<0.03	<0.03	<0.03
Total Kjeldahl Nitrogen	mg/L	0.1		0.4	0.3	0.3	0.3	1.3	0.3	0.4	0.3	0.2	0.2	0.5	0.4	<0.5	0.8	<0.5	<0.5
Ammonia, Unionized	mg/L	0.001	**0.02**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001
Nitrite + Nitrate as N	mg/L	0.06		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour	CU	2		25	17	18	18	27	20	18	20	12	15	70	16	24	17	10	13
Turbidity (Lab)	NTU	0.1	[#5]	0.6	3.2	3.6	2.3	22.5	0.9	1.8	3	0.5	0.9	0.6	9.2	1.65	14.4	1.50	0.70
Electrical Conductivity (Lab)	µS/cm	1		319	379	411	345	408	353	276	402	283	324	276	384	371	439	409	314
pH (Lab)	-	0.05	**6.5-8.5**	8.22	8.1	8.13	8.2	7.99	7.95	7.99	8.05	7.94	8.11	7.79	8.19	8.11	8.28	7.94	8.06
DO (Field)	mg/L		**5**	10.45	9.34	7.79	8.93	**4.7**	10.58	10.98	6.89	11.72	-	8.92	10.25	9.61	**4.92**	10.94	8.58
Redox (Field)	mV			5	150	97	17	113	121	111	133	41	-	126	17	261	350	222	-224
Temperature (Field)	°C			12.5	15.7	9.4	15.9	18.8	3.5	3.8	19	2.7	-	18.6	6	13.7	18.9	4.7	15.1
Conductivity (field)	µS/cm			330	390	410	310	410	400	310	410	340	-	283	359	23	370	320	340
pH (Field)	-		**6.5-8.5**	8.07	6.57	7.82	7.88	7.6	7.77	7.78	7.18	7.87	-	7.68	7.8	6.82	7.08	7.47	7.51

Comments
#1 Depends on pH and background concentration
#2 Depends on Hardness
#3 PWQO value for Total Chromium based on more stringent Chromium VI criteria.

Table 6 - Surface Water Quality

			Location Code	SW6	SW6	SW6	SW6
			Date	16 Aug 2023	28 May 2024	05 Sep 2024	13 Nov 2024
	Unit	EQL	PWQO				
Aluminium	µg/L	1	**15..75**[#1]	-	-	-	-
Aluminium (filtered)	µg/L	1	**15..75**[#1]	**215**	6	4	3
Antimony	µg/L	0.9	**20**	-	-	-	-
Arsenic	µg/L	0.1	**5**	0.9	0.4	0.4	1.2
Barium	µg/L	0.08		20.1	10.8	14.8	34.2
Boron	µg/L	2	**200**	24	14	17	11
Cadmium	µg/L	0.003	**0.1..0.5**[#2]	0.024	0.011	0.006	0.064
Chloride	µg/L	500		11,000	10,000	10,000	13,000
Chromium (III+VI)	µg/L	0.08	**1**[#3]	0.63	0.19	0.21	0.70
Cobalt	µg/L	0.004	**0.9**	0.346	0.048	0.082	0.788
Copper	µg/L	0.1	**1..5**[#2]	2.1	<1	<1	3
Iron	µg/L	5	**300**	**1,030**	47	110	**2,860**
Lead	µg/L	0.02	**1..5**[#2]	0.23	<0.09	<0.09	0.45
Mercury (filtered)	µg/L	0.01	**0.2**	<0.01	0.01	<0.01	<0.01
Nickel	µg/L	0.1	**25**	0.8	0.4	0.5	1.1
Phosphorus total (P2O5)	µg/L	3	**30**	**83**	6	5	**55**
Selenium	µg/L	0.04	**100**	0.12	0.06	0.08	0.08
Silver	µg/L	0.05	**0.1**	<0.05	<0.05	<0.05	<0.05
Strontium	µg/L	0.08		-	-	-	-
Zinc	µg/L	2	**20**	5	<2	<2	5
Alkalinity (total) as CaCO3	mg/L	2		202	139	-	195
Alkalinity (total)	mg/L	2	[#4]	-	-	199	-
Total Dissolved Solids	mg/L	1		266	186	220	226
Hardness as CaCO3	mg/L	0.05		237	125	191	206
Chemical Oxygen Demand	mg/L	5		18	31	18	<8
Total Suspended Solids	mg/L	2		15	75	7	130
Biochemical Oxygen Demand	mg/L	2		<4	<4	<4	<4
Dissolved Organic Carbon (filtered)	mg/L	0.2		6	8	5	4
Phenols (4AAP)	mg/L	0.001	**0.001**	<0.001	0.001	<0.001	**0.002**
Sulphate	mg/L	1		-	<2	<2	7
Sulphate (filtered)	mg/L	1		<2	-	-	-
Ammonia as N	mg/L	0.01		<0.1	<0.1	<0.1	<0.1
Nitrate (as N)	mg/L	0.05		<0.06	<0.06	<0.06	<0.06
Nitrite (as N)	mg/L	0.03		<0.03	<0.03	<0.03	<0.03
Total Kjeldahl Nitrogen	mg/L	0.1		<0.5	0.8	<0.5	<0.5
Ammonia, Unionized	mg/L	0.001	**0.02**	<0.001	<0.001	<0.001	<0.001
Nitrite + Nitrate as N	mg/L	0.06		-	-	-	-
Colour	CU	2		21	50	14	12
Turbidity (Lab)	NTU	0.1	[#5]	1.9	0.80	1.1	5.8
Electrical Conductivity (Lab)	µS/cm	1		404	278	407	412
pH (Lab)	-	0.05	**6.5-8.5**	8.17	8.24	7.92	7.69
DO (Field)	mg/L		**5**	9.35	9.35	9.05	11.9
Redox (Field)	mV			315	12	137	51
Temperature (Field)	°C			17.7	13.5	14.0	1.8
Conductivity (field)	µS/cm			387	305	344	476
pH (Field)	-		**6.5-8.5**	7.17	7.59	7.08	7.75

Comments
#1 Depends on pH and background concentration
#2 Depends on Hardness
#3 PWQO value for Total Chromium based on more stringent Chromium VI criteria.

Table 7 - Materials Accepted and Transferred

Quantity accepted at the Site, as recorded on daily incoming waste forms						
Month	**Vehicles**	**Total Garbage Bags**	**Reuse Centre Bins (40 yd^3 quantity)**	**Brush (yd^3)**	**Tires[1] (quantity)**	**Alcohol Containers[2] (quantity)**
January	431	608	-	-	-	-
February	397	532	-	-	-	-
March	543	789	-	-	-	-
April	517	686	-	-	-	-
May	812	972	-	-	-	-
June	1,030	1,269	-	-	-	-
July	1,331	1,535	-	-	-	-
August	1,294	1,612	-	-	-	-
September	974	1,079	-	-	-	-
October	755	954	-	-	-	-
November	439	562	-	-	-	-
December	382	545	-	-	-	-
Annual Total	**8,905**	**11,143**	**4**	**320**	**137**	**40,950**

Quantity reported to be removed from the Site, transported/processed as noted									
Month	**Waste[3] (tonnes)**	**Loads[3]**	**C&D Materials[4] (tonnes)**	**Containers[5] (tonnes)**	**Fibres[5] (tonnes)**	**Scrap Metals & White Goods[6] (tonnes)**	**WEEE[7] (tonnes)**	**Fluorescent Tubes [8, 11] (m)**	**Empty Oil/Anti Freeze Containers[9] (tonnes)**
January	4.17	-	-	2.00	1.69	-	-	-	-
February	4.43	-	-	1.71	2.58	-	-	-	-
March	8.59	-	-	1.06	1.49	-	-	-	-
April	9.60	-	-	1.57	2.00	-		-	-
May	9.19	-	-	2.69	1.39	-	-	-	-
June	9.63	-	-	1.70	2.43	-	3.13	-	-
July	16.40	-	-	3.81	3.86	-	-	-	-
August	22.50	-	-	2.46	5.08	-	-	-	-
September	11.50	-	-	2.25	2.39	-	3.88	-	-
October	13.33	-	-	2.41	2.39	-	-	-	-
November	7.10	-	-	1.55	1.39	-	-	-	-
December	5.82	-	-	1.56	1.27	-	-	-	0.06
Annual Total	**122.26**	**-**	**31.38**	**24.77**	**27.96**	**26.01**	**7.01**	**238.00**	**0.06**

Notes:

1. Transferred off-site by eTRACKS
2. Transferred off-site by Cavendish Community Centre
3. Transported by Kawartha Disposal. Scaled weights from the Bensfort Road Waste Disposal Site.
4. Transported by Kawartha Disposal to Waste Connections for processing
5. Transported by Emterra to Peterborough Materials Recovery Facility for processing by HGC
6. Transported and recycled by AIMS Recycling
7. Transported and processed by Quantum Life Cycle LPP on contract with the County of Peterborough
8. Transported to Photech Environmental Solutions for processing
9. Transported and Processed by Pnewko on contract with the County of Peterborough
10. Municiplaity Total
11. Transferred by GFL
12. Transferred by Recycling Rewards.

Appendices

Appendices

The following appendices are available in Part II – Appendices.

Appendix A **Monitoring and Screening Checklist**

Appendix B **Environmental Compliance Approval No. A341202**

Appendix C **Field and Climate Data**

Appendix D **Laboratory Certificates of Analysis**

Appendix E **Site Photographs**

Appendix F **Borehole Logs**