

2021 Annual Report, Stoney Lake Road Landfill



Environmental Compliance Approval No.: A340901

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Prepared for:
The Corporation of the Township of Douro-Dummer

Cambium Reference: 12987-004

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Executive Summary

The Stoney Lake Landfill is owned by the Township of Douro-Dummer and operates as a waste transfer station, managed by Waste Connections of Canada under Ministry of the Environment, Conservation and Parks Environmental Compliance Approval No. A340901. The site is on the east half of Lot 21, Concession 4, Township of Douro-Dummer, County of Peterborough. The municipal address is 348 County Road 6, about 6 km east of the town of Lakefield. The total site area is 4.25 ha and has an approved landfill area of 1.60 ha. The site ceased landfilling operations in 2003 and final closure activities were completed in 2005.

This report presents the results of the 2021 activities that were completed at the Stoney Lake Road Landfill. 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 in the vicinity of the site is southeast in the overburden/upper bedrock and lower bedrock aquifer. Groundwater is anticipated to discharge to unevaluated wetlands and the Galesburg Provincially Significant Wetland to the southeast.

A leachate plume is evident beneath and down-gradient of the waste mound. Impacts were generally restricted to the overburden/upper bedrock aquifer. Natural attenuation is occurring as concentrations generally decrease with distance.

Although numerous parameters exceeded the Ministry’s Reasonable Use Criteria, groundwater is interpreted to discharge to surface. As such, the intent of Ministry Guideline B-7 is satisfied.

The surface water quality down-gradient of the waste mound continued to be un-impacted by waste disposal operations. It is evident that outside sources (i.e., road de-icing activities, and wetland environments) and poor sampling conditions were influencing to the water quality. The surface water trigger was not activated in 2021 and no further action was warranted.



Gas measurements collected in 2021 were less than 2.5% methane by volume at the perimeter monitoring wells, and less than 1.0% methane by volume in the on-site structures.

A Ministry site inspection completed on December 11, 2020, noted numerous deficiencies. Following the inspection, the Township of Douro-Dummer and Waste Connections completed the necessary requirements to ensure compliance with the ECA in 2021.

Many aspects of the established monitoring program are considered redundant and/or unnecessary to determine Site compliance. As such, Cambium has proposed changes to the established monitoring program that remove components deemed unnecessary.

Boron concentrations are increasing at well TW07-2. No boron impacts have been observed at the closest down-gradient surface water location SW1 at this time. However, in addition to the proposed modifications of the established monitoring program, a contingency plan has been outlined that will further investigate boron concentrations in the areas southeast of the Site.

The reductions to the established monitoring program, and the proposed contingency plan should be completed in parallel, at the same time. The need for continued monitoring of the newly installed drivepoint piezometer, and any other mitigation measures will be determined during and after the completion of the contingency plan.

Respectfully submitted,

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1.0 Introduction

The Corporation of the Township of Douro-Dummer (Township) retained Cambium Inc. (Cambium) to complete the 2021 annual monitoring program for the Stoney Lake Road Landfill (Site). The Site operates under Ontario Ministry of the Environment, Conservation and Parks (Ministry) Environmental Compliance Approval (ECA) No. A340901, most recently amended on June 9, 2016 (Appendix B).

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

- **Closure Plan, Stoney Lake Road (North) Waste Disposal Site** (LR, 2000)
- **Hydrogeological Study, Stoney Lake Road “North” Landfill Site** (LR, 1994)

1.1 Site Location

The Site is on the east half of Lot 21, Concession 4, in the Township of Douro-Dummer, County of Peterborough (Figure 1). The municipal address for the Site is 348 County Road 6 (Stoney Lake Road). The Site is accessed from the north side of County Road 6, about 6 km east of the town of Lakefield. The Universal Transverse Mercator (UTM) coordinates for the site entrance are Zone 17, 720969 m east, 4926536 m north.

1.2 Site Description

The Site was owned operated by the Township for the operation of a solid waste natural attenuation landfill until closure in 2003. Final closure activities were completed in 2005. Currently the Site operates as a waste transfer station, managed by Waste Connections of Canada (Waste Connections), for the collection of solid non-hazardous waste, and construction and demolition (C&D) materials. Waste Connections leases the property from the Township.

The Site is fully fenced and has a locked gate. The Site is in a rural area and is bordered by forest and wetland to the east and south, and passive agricultural land to the north and west.



Site details are included in Embedded Table 1. A local topography plan is attached as Figure 2. Existing site conditions are on Figure 3.

Embedded Table 1 Site Details

Total Site Area	4.25 ha
Approved Area of Refuse Placement	1.60 ha
Approved Site Capacity	54,000 m ³

1.3 Scope of Work

The scope of the 2021 work program was based on the results of the 2020 monitoring program (GHD, 2021), the requirements outlined in the ECA Condition 6 (8), and included:

- Groundwater elevation monitoring
- Surface water and groundwater sampling and analysis
- Landfill Gas (LFG) monitoring
- 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 groundwater quality at select monitoring wells against the Provincial Water Quality Objectives (PWQO)
- Evaluation of surface water quality against the PWQO and calculated surface water trigger values
- Site Inspection
- An overview of site development and operations
- Preparation of this annual report

This report presents the results of the 2021 work program and provides an assessment of current landfill impacts on surrounding groundwater and surface water environments. Recommendations for the 2022 monitoring program, based on the 2021 results and assessment, are outlined herein. Furthermore, this report addresses the Ministry Site



Inspection report completed by Sarah Bellamy, Environmental Officer, Peterborough District Office on December 11, 2020 (Appendix C).



2.0 Methodology

The 2021 work program was completed to maintain compliance with the ECA and Ministry requirements. As such, the environmental monitoring work program was completed consistent with **Guidance Manual for Landfill Sites Receiving Municipal Waste** (MOEE, 1993) 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.

Surface water and groundwater samples were stored in coolers with freezer packs and maintained at less than 10°C during transport to Caduceon Environmental Laboratories (Caduceon) in Kingston, Ontario. Caduceon is accredited by the Canadian Association for Laboratory Accreditation Inc. for specific environmental tests listed in the scope of accreditation. Groundwater samples were analyzed for those parameters referenced by the most recent Annual Monitoring Report (GHD, 2021), and are also outlined in Table 1.

2.1 Groundwater Monitoring Program

The following tasks were completed as part of the 2021 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 event 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, at select monitors) analysis was field filtered.
- Field measurements were recorded for pH, conductivity, temperature, dissolved oxygen (DO), and oxygen reduction potential (ORP).

Groundwater samples were collected on June 28 and November 10 from the monitoring wells listed below at the frequencies listed in attached Table 1. The only deviation from the monitoring program was that monitoring well TW08-2 had insufficient volumes for sample collection during the spring sampling event.

Monitoring wells included in the groundwater monitoring program are shown on Figure 3. 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 D. Laboratory Certificates of Analysis are in Appendix E. Photographs of each monitoring location are in Appendix F.

- TW02-1 • TW02-2 • TW03-1 • TW04-1 • TW05-1 • TW05-2
- TW06-1 • TW06-2 • TW07-1 • TW07-2 • TW08-1 • TW08-2
- TW09-1 • TW09-2 • TW10-2 • TW11-2

The following blind duplicate groundwater samples were collected as part of the Quality Assurance/Quality Control (QA/QC) program. As these field duplicates equate to at least 10% of the total samples collected, this is an adequate QA/QC program for groundwater. In addition to these samples, the laboratory completes internal QA/QC. The results of the QA/QC program are presented in Section 4.1.

- June: TW02-2 (includes VOC duplicate), and TW04-1
- November: TW04-1, and TW06-2 (includes VOC duplicate)



2.2 Surface Water Monitoring Program

The following tasks were completed as part of the 2021 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) analysis was filtered by the laboratory.
- Field measurements including pH, conductivity, temperature, DO, and ORP were recorded at each sample location.
- Where possible, depth, width, and flow velocity measurements were collected at each surface water location.

The surface water monitoring program included sample collections from on-site surface water sample stations SW3, and SW6 and off-site stations SW1, and SW8 on June 28, August 26, and November 10. The following deviations from the monitoring program were noted:

- Stations SW3 and SW6 were dry during the June sampling event.
- Stations SW3, SW6, and SW8 were dry during August sampling event.

Surface water sampling locations are shown on Figure 2. The UTM coordinates for the monitoring locations are in Embedded Table 2. Surface water results are discussed in Section 4.3. The surface water field data sheets are in Appendix D. Laboratory Certificates of Analysis provided by Caduceon are in Appendix E. Photographs of each surface water sample location are in Appendix F.

Blind duplicate surface water samples were collected from station SW1 during all three monitoring events in 2021 as part of the QA/QC program. As these field duplicates equate to at least 10% of the total samples obtained, this is an adequate QA/QC program for surface water. The results of the QA/QC program are presented in Section 4.1.



2.3 Landfill Gas Monitoring Program

Landfill gas monitoring was implemented at the Site 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 the concentration of methane gas in the subsurface may not exceed 2.5% by volume at the property boundary.

Landfill gas, specifically methane and carbon dioxide, is derived from the decomposition of organic wastes. Production of LFG from landfilled wastes normally reaches a maximum rate approximately two years after placement and may continue at this rate for many years. The biological decomposition process results in the generation of LFG until some period, likely decades, after the landfilling of that waste ceases. Hazardous concentrations for methane are 5 to 17% methane by volume or between 50,000 and 170,000 ppm (Werner Sölken, 2021)..

Landfill gas monitoring was conducted on all groundwater monitoring wells, gas probes (GP1 and GP2), and on-site structures (waste storage building and office) in conjunction with the spring and autumn sampling events. An RKI Eagle 2 Gas Monitor calibrated for methane, and hydrogen sulphide was used to collect measurements. The LFG monitoring results are in Table 9 and discussed in Section 4.4.

2.4 Site Review and Operations Overview

Site operations were observed during site visits completed in June, August, and November 2021. During these visits, the items listed below were inspected on accessed areas of the Site and observations noted in the field file. In February 2022, Waste Connections provided additional 2021 site operations information. Site inspection results are presented in Section 5.0.

- Litter control
- Condition and layout of recycling bins
- Status of monitoring well security
- Condition and layout of access roads, access gates
- Final cover integrity



3.0 Geological and Hydrogeological Context

3.1 Topography and Drainage

The Site is in the Otonabee River tertiary watershed and the Lock19 – Otonabee River quaternary watershed. The Galesburgh Provincially Significant Wetland (PSW) is east-southeast of the Site. Unevaluated wetlands are found to the east and west of the Site. Locally, drainage on-site is generally directed east towards an unnamed watercourse which flows through the Galesburgh PSW (with a minor portion of drainage directed westwards). The unnamed watercourse flows south, under County Road 6, through a culvert. Overall drainage is directed south-southwest through a complex series of unevaluated wetlands a portion of the Galesburgh PSW, and various other ponds and perennial streams which eventually discharge into Buckley Lake, about 3.0 km southwest of the Site. From Buckley Lake, drainage is directed to the southwest eventually discharging into the Otonabee River.

The surface water drainage systems on and near the Site have generally been characterized as stagnant, with intermittent flows occurring during periods of increased precipitation.

There are currently four surface water locations around the Site, as described below (Figure 2).

- SW1 is about 350 m east and down-gradient of the Site at a culvert on the north side of County Road 6. This surface water station is on a perennial stream with a well-defined channel.
- SW3 is at the southwest corner of the Site in wetland type environment. This area has the potential to collect surface water run-off.
- SW6 is slightly down-gradient the toe of the waste mound to the east, in a low lying wet area.
- SW8 is on a tributary, about 500 m east of the Site, which drains into the perennial stream where SW1 is situated. This station is used to monitor background water quality.



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 D.

Embedded Table 2 Coordinates of Surface Water Stations

Surface Water Station	Northing	Easting
SW1	4926664	721376
SW3	4926525	720902
SW6	4926665	720950
SW8	4926853	721559

Notes:

1. Zone 17.

3.1.1 Precipitation Data

A review of the 2021 precipitation data for the Peterborough Trent U (Government of Canada, 2021a) in comparison to the average precipitation data for 1981 to 2010 (Government of Canada, 2021b) indicated that the overall precipitation was normal; however, varied from month to month.

In 2021, the wettest months of the year were July and September which had 81% and 94% more precipitation than normal. Conversely, the driest months of the year were May and August. 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 D for field sheets and climate data.

Embedded Table 3 Historical and 2021 Precipitation Data

Sampling Date	Average Monthly Precipitation (mm) (1981 – 2010)	2021 Precipitation (mm)	Precipitation During and Prior to Sampling (mm)
June 28	79.9	94.3	32.0
August 26	77.0	20.6	0.2
November 10	86.4	49.4	0.0



3.2 Hydrogeology

The Site is in the physiographic region known as the Peterborough Drumlin Field. This area is characterized by a northeast-southwest trending drumlin features. The underlying bedrock consists of limestone with minor shale of the Middle Ordovician Trent-Black River Group (GHD, 2021). Most of the area is densely covered with glacial deposits, formed from the retreat of the Wisconsin ice sheet during the Pleistocene Epoch. The features surrounding the Site include moraines, drumlins, and kames (LR, 1994).

There are 16 wells in the current groundwater monitoring program, six of these wells are nested/clustered wells which monitor the overburden/upper bedrock units, and the lower bedrock unit. All lower bedrock monitoring wells are designated with a -1 in their well name. Available borehole records indicate that the lower bedrock monitors were installed at variable depths from about 5 m below ground surface (bgs) to about 11 mbgs on the eastern slope of the waste mound. Conversely the overburden varies in depth from about 2.5 mbgs (east of the waste mound) to 5 mbgs (south of the waste mound) and is comprised of dense sandy, glacial till (Appendix G). Throughout the 2021 monitoring year water levels ranged from 0.48 m above grade at TW09-1 to 7.81 mbgs at TW04-1 in the lower bedrock aquifer. Water levels ranged from 0.13 m above grade at TW09-2 to 4.46 mbgs at TW02-2 during the 2021 monitoring period.

Groundwater wells included in the current monitoring program are described below. Refer to Table 2 for a summary of monitoring well depths and Figure 3 for locations.

- Clustered wells TW02 are installed on the northern slope, and immediately adjacent waste footprint. Borehole logs indicate that no waste was encountered at these monitors during installation.
- Monitoring well TW03-1 are installed on the eastern slope of the waste mound. Monitoring well TW04-1 are installed in the central east area of the waste mound, at the top of the slope. Both monitors were completed within the waste footprint, in the lower bedrock aquifer.



- Clustered wells TW05, TW07, and TW09 are installed about 20 m, 75 m, and 110 m south-southeast and down-gradient of the waste mound. Monitoring well TW07 is near the property boundary and TW09 is off-site on the south side of County Road 6.
- Clustered wells TW06 are installed about 25 m downgradient of the waste mound on the eastern property boundary.
- Clustered wells TW08 are installed about 50 m up-gradient and northwest of the waste mound. These wells are used to assess background water quality. Replacement wells were installed in late 2014, adjacent the old monitors, as TW08-1 was previously abandoned, and TW08-2 was always dry.
- Monitoring well TW10-2 is installed at the toe of the eastern slope of the waste mound. Monitor TW11-2 is installed on the eastern slope of the waste mound. No borehole logs were available at the time of this report but given the location of TW11-2 is it assumed that this monitoring well is installed at or below the waste.

3.2.1 Well Records

A Ministry well record search completed in 2022 for a radius of 1 km from the Site yielded 26 results (MECP, 2022). No residential supply wells described below were identified within a 500 m of the Site. The following observations are provided:

- Eleven records where for monitoring wells at the Site.
- Eight well records were incorrectly plotted.
- Three well records were identified to the west (cross-gradient) of the Site ranging in depth from about 15 to 25 m. Wells were installed in the limestone bedrock and reported a static water level ranging from about 7 to 19 m.
- Two well records were identified north (up-gradient) of the Site at depths of about 18 and 53 m. The shallow well was completed in the brown limestone and had a static water level of about 10 m. Conversely, the deep well was completed in the grey limestone and red granite and had a static water level of about 6 m.



- One well record was identified to the southeast (down-gradient) of the Site at a depth of about 45 m and installed in the grey limestone and red/black granite. The static water level was about 11 m.
- One well record was identified to the southwest (cross-gradient) of the site at a depth of about 18 m and completed in the limestone bedrock. The static water level was about 8 m.

Given the depth to the domestic wells and distance away from the Site, the potential for adverse impact to down-gradient domestic water supplies is minimal. The water well locations are shown on Figure 2 and water well records are in Appendix H.

3.2.2 Groundwater Flow Direction

Groundwater levels measured in the spring and autumn 2021 were used to calculate groundwater elevations and groundwater flow direction summarized in Table 2, and shown on Figure 4 and Figure 5. Groundwater elevation contours and flow direction are shown on Figure 6 (overburden/upper bedrock) and Figure 7 (lower bedrock). The general direction of shallow groundwater flow is to the in the overburden/upper bedrock and lower bedrock units were southeast, consistent with historical observations. The calculated horizontal hydraulic gradients to the southeast in 2021 were as followed:

- Overburden/upper bedrock: 0.01 m/m in the spring, and 0.016 m/m in the autumn
- Lower Bedrock: 0.02 m/m in the spring, and 0.03 m/m in the autumn

3.2.3 Vertical Gradients

Groundwater elevation data was used to calculate the vertical gradients for all multi-level monitors at the Site (Table 3). Vertical gradients at most wells where downward, though upward gradients were observed at clustered monitors TW07 and TW09 southeast of the waste mound. Vertical hydraulic gradients at wells TW06 were considered to be neutral.



3.3 Conceptual Site Model

The following characterization of hydrogeological conditions is based upon the previous annual monitoring reports completed by GHD (GHD, 2021), the Hydrogeological Study completed by Lakefield Research (LR, 1994), and other supporting data.

In general, local drainage on-site is mostly directed east-southeast towards a watercourse that flows through the Galesburgh PSW. The watercourse flows south, under County Road 6, through a culvert. The watercourse continues to flow south into Buckley Lake, which in turn discharges to the Otonabee River.

The surface water drainage systems on and near the Site are generally stagnant due to the relatively flat topography of the area. Surface water flow is only anticipated during times of increased precipitation.

The general direction of groundwater flow in the overburden/upper bedrock, and lower bedrock aquifers were determined to be toward the southeast. Vertical gradients are typically reported as downward across the Site. However, neutral vertical gradients are consistently reported at clustered wells TW06 and upward gradients are regularly sustained in the areas southeast of the Site in closest proximity to the wetland area (i.e., clustered wells TW07, and TW09). Given this evaluation, groundwater is interpreted to discharge to surface in the areas southeast of the Site. The primary receiver of landfill leachate are the unevaluated wetlands and Galesburg PSW to the southeast.



4.0 Results and Discussion

Water quality results from the monitoring program are used to assess the existence, extent, and degree of impacts to the groundwater and surface water environments related to waste disposal site activities at the Site.

To ensure appropriate actions are in place to respond to degradation in surface water or groundwater quality beyond an acceptable level, site-specific trigger levels and contingency measures aid in the assessment of impacts from leachate contamination and help to prevent adverse impacts to the environments surrounding the waste disposal site.

This section presents the results of the 2021 monitoring program.

4.1 Quality Assurance / Quality Control

Results from the analyses completed on the blind duplicate samples obtained as part of the QA/QC program 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 at least one result was 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%. Exceptions were noted:

- Total Kjeldahl Nitrogen (TKN) at monitoring well TW02-2 in June.
- Sulphate and total phosphorus at station SW1 in November.
- Ammonia at TW06-2 in November.

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

4.2 Groundwater Quality

Groundwater analysis data for 2011 to 2021 are in Table 4 through Table 7.



To assess water quality impacts related to landfill site operations, groundwater analytical results were compared to background water quality and historical data. Site compliance was assessed using the ODWQS (MOE, 2006) and the RUC (MOEE, 1994a). In addition, as there is potential for shallow groundwater to discharge to the nearby surface water features select monitors were compared to the PWQO (MOEE, 1994b). This aids in predicting any potential adverse impacts to the surface water down-gradient of the Site as a result of leachate impacted groundwater discharging to surface.

4.2.1 Background Groundwater 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. In this respect, the quality of the groundwater that is not impacted by the waste disposal site operation (background water quality) should be used for comparison purposes. Given the location of up-gradient cluster monitors TW08 (Figure 3), the groundwater results for this well represents background water quality at the Site. Monitoring well TW08-1 was completed in the lower bedrock and TW08-2 was completed in the upper bedrock.

Monitoring well TW08-1 generally has similar water chemistry to TW08-2 though some metals (e.g., iron, chloride, manganese, etc.) were reported from TW08-1 at greater concentrations. Conversely, TW08-2 has elevated concentrations of alkalinity, and phosphorus when compared to TW08-1.

Only one sample could only be collected from TW08-2 in November 2021 as the monitoring well was reported to have insufficient sampling volumes in June. The water quality at clustered wells TW08 was generally consistent with historical ranges, though nitrate concentrations were slightly elevated at TW08-2 in November. Overall, the water quality at these monitors remained representative of background conditions at the Site.

4.2.2 Leachate Characteristics

Monitoring wells TW03-1, TW04-1, and TW11-2 were installed within the waste mound. No well records were available for TW10-2; however, given that this monitor is installed on the northeastern boundary of the existing limit of waste it was included in the leachate



assessment. Lastly, monitors TW02-1 and TW02-2 were installed up-gradient on the north slope of the waste mound. Water quality results at these locations have been indicative of the leachate quality. Several Leachate Indicator Parameters (LIPs) have been identified at the Site. A parameter was considered a LIP if it has been regularly reported at concentrations greater than background water quality. The LIPs identified at the Site are outlined below in Embedded Table 4, as defined by GHD (GHD, 2021).

Embedded Table 4 Leachate Indicator Parameters

alkalinity	barium	boron	chloride	iron
manganese	total dissolved solids (TDS)	nitrate	sodium	sulphate

Monitoring well TW04-1 is centrally located on the waste mound and TW03-1 is installed on the eastern slope. Both monitors were installed in the lower bedrock aquifer below the waste mound. Most LIP concentrations are significantly elevated at both monitoring wells except for alkalinity and barium at TW04-1, and nitrate at TW03-1. Water quality results in 2021 were generally consistent with historical concentrations except for elevated nitrate at TW04-1 in November. The water quality at both monitoring wells were considered stable with no apparent increasing or decreasing trends.

Monitoring well TW10-2 is installed at the toe of the waste mound and TW11-2 is installed on the eastern slope. Historical water quality at both monitoring wells indicated that these wells are impacted by waste disposal operations as all LIPs are significantly elevated over background concentrations. Though both monitoring wells are impacted, the leachate signature is different with concentrations being generally greater at down-gradient well TW10-2. The only exception is sulphate and chloride which were greater at TW11-2. The water quality in 2021 was generally consistent with historical ranges except for elevated concentrations of boron at TW10-2, and nitrate at TW11-2 in November.

Monitoring wells TW02-1 and TW02-2 were installed up-gradient, on the north slope of the waste mound in the lower and upper/overburden bedrock aquifers, respectively. The available mapping and borehole logs indicated that these monitors were not installed within an area of waste placement but given that they are within the approved landfill footprint there is a



potential for these monitors to be impacted by radial groundwater flow. The water quality between the two aquifers were significantly different. It is evident that the water chemistry in the upper bedrock aquifer (TW02-2) has been impacted by waste disposal operations as all LIPs except for nitrate were significantly elevated over background water quality. Conversely, the water quality at TW02-1 in the lower bedrock aquifer was similar to background water quality with the exception of chloride. The water quality in 2021 was consistent with historical concentrations and is considered stable with no increasing or decreasing trends.

4.2.3 Down-gradient Groundwater Quality

Clustered wells TW06, TW05, TW07, and TW09 monitor the overburden/upper bedrock and lower bedrock aquifers down-gradient to the east-southeast.

Clustered wells TW06 are down-gradient the waste mound to the east and adjacent the property boundary. Monitoring well TW06-1 is completed in the lower bedrock aquifer whereas TW06-2 was screened across the overburden/upper bedrock aquifer interface. Most LIPs were elevated at these monitors when compared to their background quality except for chloride (TW06-1), iron, and nitrate. The water quality in the overburden/upper bedrock aquifer at TW06-2 had generally greater concentrations of LIPs when compared to the TW06-1 including boron, chloride, sodium, TDS, and sulphate. The vertical gradients calculated between the two monitors is either neutral, or slightly downwards which supports the conceptual Site model which indicates that vertical groundwater migration is restricted and will discharge to surface to the east-southeast. The water quality in 2021 was generally consistent with historical concentrations with no increasing or decreasing trends.

Nested wells TW05 are down-gradient the waste mound to the southeast. Monitoring well TW05-1 is installed in the lower bedrock aquifer whereas TW05-2 is in the overburden/upper bedrock aquifer. All LIPs at both locations were significantly elevated over background quality except for nitrate at TW05-1 and barium at TW05-2. The water quality in 2021 was generally consistent with historical results except alkalinity at monitoring well TW05-1 in November. Increasing trends are evident at TW05-1 for alkalinity, chloride, and sulphate. However, the water quality at TW05-2 is variable and concentrations of these parameters appear to be stabilizing within recent years. Several LIPs (including boron), are regularly reported from well



TW05-2 at concentrations greater than the leachate characterization wells. Similar parameters were also reported at well TW05-1 at concentrations greater than the leachate indicator wells installed in bedrock (albeit, at concentrations generally less than TW05-2). As such, clustered wells TW05 are also considered to be a leachate characterization wells, even though available information indicates that they are installed outside of the waste footprint. Given the close proximity to the waste mound, the elevated LIP concentrations were not unexpected.

Clustered wells TW07 are on the north side and adjacent to County Road 6. All LIPs except nitrate are elevated at TW07-2. Given the proximity to County Road 6 some impact may be partially attributed to road de-icing activities (i.e., chloride, sodium, and TDS). The water quality in 2021 was generally consistent with historical results at both monitors. An increasing trend for boron is apparent at TW07-2, whereas concentrations of sulphate, TDS, and barium have been decreasing since at least 2018. The concentrations of all LIPs were reported from well TW07-1 at concentrations either similar to or less than those reported from well TW07-2, indicating that leachate influences at well TW07-1 are minor (i.e., only the concentration of iron was reported at concentrations greater than ODWQS criteria in 2021 from well TW07-1).

Clustered wells TW09 are off-site and on the south side of County Road 6. The water quality at both monitors is similar to their respective background wells. The only exception is parameters associated with road de-icing activities and barium. Given the lack of other elevated LIPs, these wells are considered not impacted by waste disposal operations. The water quality results were consistent with historical ranges and is considered stable at both monitors.

4.2.4 Volatile Organic Compounds

Volatile Organic Compound (VOC) analysis was completed in the spring and autumn at monitor TW02-2 and TW06-2. Historical results have indicated sporadic ODWQS exceedances for toluene at both monitors with the occurring last at TW06-2 in 2018. All VOC concentrations were less than the reported detection limit in 2021. Refer to Table 6 for VOC results.



4.2.5 Provincial Water Quality Objectives Assessment

Given that there is potential for groundwater discharge to surface, monitors TW06-2, TW07-2 and TW09-2 were compared to the PWQO (Table 7). The following parameters did not meet the PWQO criteria at the identified locations:

- TW06-2: boron (November), phosphorus (November), and DO
- TW07-2: boron, iron, phosphorus (June), and DO
- TW09-2: phosphorus

Phosphorus is not an identified LIP at the Site and can be attributed to natural elevated concentrations within the area. Due to the nature of DO in groundwater, low DO measurements are not unexpected and are not considered significant for groundwater quality comparisons.

As previously mentioned in Section 4.2.3, boron and iron concentrations were elevated over background water quality at TW07-2. Given that boron concentrations are increasing (and were reported at concentrations marginally greater than the Canadian Water Quality Guideline (CWQG) (CCME, 2011) of 1,500 µg/L in 2021) a contingency plan has been proposed to monitor for potential impacts east of TW07-2. Further details are discussed in Section 4.5.

4.2.6 Groundwater Compliance Assessment

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. Condition 8 (2a) of the ECA indicates that the Site shall be operated in such a way to ensure compliance 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 LIPs with an ODWQS criteria using background water quality at TW08-1 and TW08-2 for the lower bedrock and overburden/upper bedrock, respectively. The RUC values were then compared to the water quality results at wells TW06-1, TW06-2, TW07-1, TW07-2, TW09-1, and TW09-2. Historically TW10-2 and TW11-2 has been included in this assessment; however, given that these monitors were installed within and adjacent the waste mound (i.e., not on the property boundary) assessing compliance with these wells was considered redundant.



The following parameters exceeded the RUC criteria in the overburden/upper bedrock aquifer in 2021 (Table 4):

- TW06-2: alkalinity (June), and TDS
- TW07-2: chloride, iron, TDS, and sulphate
- TW09-2: barium (June), and iron (June)

It is possible that the RUC exceedances reported from well TW06-2 are a result of landfill leachate influences. As previously discussed in Section 4.2.3, monitoring well TW07-2 is adjacent County Road 6 and the RUC exceedances for chloride, iron, and TDS can at least be partially attributed to road de-icing activities. The water quality at TW09-2 is interpreted not to be impacted by the Site. As such, the RUC exceedance for barium was attributed to an outside source. Furthermore, the iron exceedance can be attributed to the rich organic soils within the area the well has been installed.

The following parameters exceeded the RUC criteria in the lower bedrock aquifer in 2021 (Table 5).

- TW06-1: barium, manganese, alkalinity (November), and TDS
- TW07-1: iron
- TW09-1: no exceedances

It is possible that the RUC exceedances reported from well TW06-1 are a result of landfill leachate influences. The RUC exceedances for TW07-1 are potentially sourced from landfill leachate influences (but iron concentrations are relatively low, as such leachate influences are considered minor at this well).

As outlined in Section 3.3, groundwater flow across the Site is to the southeast. Upwards hydraulic gradients are regularly reported at wells TW07 and TW09 between the deeper bedrock aquifer and shallower bedrock/overburden aquifer. Monitor TW06 is at the eastern property boundary of the Site. The hydraulic gradient between the deep and shallow bedrock wells is negligible (and is considered neutral). It is noted that the TW06-2 is installed to a depth of approximately 3.4 mbgs, whereas the deeper bedrock well is installed to a depth of



approximately 5.0 mbgs. The screens of these two wells only have a vertical separation of approximately 1.6 m (as compared to vertical separation distances of approximately 5 and 6 m at wells TW07 and TW09). It is expected that upward hydraulic gradients, sourced from deeper portions of bedrock aquifer, exist in the area of TW06 and further east/southeast of the Site. These conditions have already been proven to exist at wells TW07 and TW09, as such it is reasonable to assume that similar conditions exist in other lower elevation/down-gradient areas of the waste mound (such as TW06).

Due to the upward hydraulic gradients at wells TW07 and TW09 it is expected that groundwater discharges to surface water in the areas immediately south and east of the Site. As such, the intent of Ministry Guideline B-7 is considered to be satisfied. Assessing compliance by referencing Guideline B-7 is not considered appropriate for the Site. Further, there are no known groundwater users in close proximity that are hydraulically down-gradient of the Site. The risk of leachate influencing local groundwater supplies is considered low.

The adequacy of the existing environmental monitoring program is discussed further in Section 4.5.

4.3 Surface Water Quality

The 2011 to 2021 surface water quality data are included on Table 8. The surface water data have been compared with background water quality and historical data, and compliance was assessed using the PWQO (MOEE, 1994b).

4.3.1 Background Surface Water Quality

Station SW8 is a perennial stream in a wetland environment, about 150 m north of County Road 6, and is representative of background surface water quality. This station is only connected to downstream and down-gradient station SW1. Historical water quality results indicate low but detectable concentrations of most metals, and the occasional PWQO exceedance for iron, total phosphorus, and phenols. Additionally, copper, and pH (high, field and lab) have sporadically exceeded the PWQO criteria.

Only two samples were collected from this station in 2021 as this station was dry during the summer sampling event. Water quality results in 2021 were generally consistent with historical



concentration ranges. The only parameters to exceed the PWQO criteria were zinc, and total phosphorous. Overall, the water chemistry at station SW8 continued to represent background surface water quality for the Site.

4.3.2 Downstream Surface Water Quality

Station SW1 is the farthest down-gradient surface water monitoring station and is located off-site. The water quality at this station is similar to background station SW8 including the occasional PWQO exceedances for iron, total phosphorus, and phenols. Where differences in water quality were observed this can be attributed to road de-icing activities along County Road 6. The water quality results in 2021 were consistent with historical results including the PWQO exceedances for iron, and total phosphorus. This surface water station has not been impacted by the Site.

Stations SW3 and SW6 are on the southwest and eastern property boundaries (respectively). Both stations are in low-lying wet areas with potential to receive surface water run-off from the waste mound. Both stations were dry during the spring and summer sampling events in 2021. Samples from these stations were only collected in November.

Historical water quality at station SW3 has indicated low concentrations of most parameters with the occasional spikes in concentration. This can be attributed to the low-lying stagnant nature of the water body which results in poor sampling conditions. As this station is adjacent County Road 6, elevated concentrations of hardness, TDS, chloride, and alkalinity can be attributed to road de-icing activities. As such, an increasing trend is apparent for chloride at this location. Total phosphorus and boron are the only parameters that persistently exceed the PWQO criteria at this station as was the case in 2021. Although boron has persistently exceeded the PWQO (average 277 µg/L), the concentrations were much less than the CWQG criteria for boron of 1,500 µg/L (CCME, 2011). Given that total phosphorus is not a LIP for the Site, it is likely that the elevated concentrations can be attributed to naturally elevated concentrations within the area. The water quality results in 2021 were generally consistent with historical concentrations.

At the time of this report, only five data sets were available for station SW6. Initial results indicate persistent exceedances of the PWQO criteria for iron, mercury, total phosphorus, and



phenols. Only total phosphorus exceeded the PWQO criteria in 2021. Given the lack of water quality data available it is difficult to discern site-related impacts at this station.

4.3.3 Surface Water Compliance Assessment

The following sections discuss the surface water trigger assessment as outlined in the 2020 Monitoring Report (GHD, 2021).

4.3.3.1 Trigger Location

Surface water trigger points are generally at any point where surface water impacts due to landfilling operations are likely to occur. As such, station SW1 was identified by the Ministry as the primary downstream trigger sampling location.

4.3.3.2 Trigger Parameter Concentrations

The surface water trigger criteria was calculated using background water quality at station SW8 for all parameters listed in Table 1. An exceedance at the downstream surface water stations is the numerical elevation of an analytical value greater than the 75th percentile at the background surface water station SW8.

The 75th percentile is defined as the number in a data set in which 75% of the values are less than that number and 25% of the values are greater than that number. A minimum of eight water samples, not including the assessment year, at the selected upstream background compliance monitoring location is recommended.

4.3.3.3 Surface Water Trigger Mechanism

Three consecutive annual exceedances of the trigger criteria at station SW1 and deemed to be caused by the Site would initiate the preparation of a contingency plan. The contingency plan is based on a three-tier system detailed below.

Tier 1- Alert: If a parameter exceeds the PWQO criterion for three consecutive sampling events, then the Tier 2 trigger would be implemented.

Tier 2- Confirmation: Three additional samples will be collected on a monthly basis starting after the third PWQO exceedance. Samples will be collected from the background monitoring



location SW8 and station SW1, at a minimum. The purpose of additional sampling is to confirm that the exceedances can be attributed to the Site. If the exceedance is determined to be caused by the Site, then a discussion would be initiated between the Township and the Ministry to determine appropriate actions required. The meeting should take place within 6 months from the activation Tier 2.

The first remedial step should be a detailed surface water/biological study to determine the trigger exceedances are impacting the water quality and biology of the receiving watercourse. If impacts were determined to be negligible following the surface water study then Ministry support would be requested to not implement the contingency plans.

If negative impacts are determined by the study, then the contingency plan would commence following the next exceedance of a trigger parameter during any routine sample event. The plan should include the following:

- A recommendation for Site closure or continued operation with designed controls to prevent further impacts (e.g., leachate collection and treatment system, surface water drainage works, low permeable soil or geotextile capping on the waste mound).
- A schedule for the installation of remedial works.
- An initial plan for subsequent monitoring to confirm the remediation controls have reduced surface water impacts.

Tier 3 – Compliance: This is the implementation of the remedial works to be completed and the additional monitoring required to determine its effectiveness.

4.3.3.4 2021 Compliance Assessment

The only parameters to exceed the surface water trigger criteria for three consecutive events at station SW1 were zinc, sulphate, and conductivity. The only LIP to exceed the trigger criteria was sulphate. Given that no other LIPs exceeded the trigger criteria the exceedances were not attributed to the Site. Elevated concentrations of sulphate were also reported at SW8 during the June and November sampling events in 2021, therefore downstream concentrations of sulphate could have been caused by natural conditions.



Furthermore, as there is no PWQO criteria for sulphate, compliance was further assessed using the British Columbia Water Quality Guideline (BCWG) (BCMOE, 2016). The reported sulphate concentrations in 2021 (average 5 mg/L) were significantly less than the BCWG criteria of 428 mg/L. As such, it was determined that no negative impact was anticipated to occur to the downstream surface water locations. The surface water trigger was not activated in 2021 and no further action was warranted.

4.4 Landfill Gas Monitoring

LFG, specifically methane and carbon dioxide, are derived from the decomposition of organic wastes. Production of LFG from landfilled wastes normally reaches a maximum rate about two years after placement and may continue at this rate for many years. The biological decomposition process results in the generation of LFG until some period, likely decades, after the landfilling of that waste ceases.

The 2021 LFG results are included on Table 9 and in Appendix D. Landfill gas measurements for methane, and hydrogen sulphide were collected during the spring and autumn sampling events at all groundwater monitors, gas probes, and on-site structures (office and sorting building) (Figure 3). Gas measurements were not collected in the office during the spring monitoring event as a COVID-19 precaution.

Measurements collected in 2021 indicated detectable methane concentrations at monitoring wells TW03-1, TW10-2 (November), TW11-2 and gas probes GP1, and GP2. Given that these locations were installed within the existing limit of waste elevated methane concentrations were not unexpected. Of note, methane concentrations at TW03-1, TW11-2, GP1, and GP2 had at least one measured concentration within the lower explosive limit. Caution should be used when working around these monitoring locations in the future.

The remaining monitoring location measurements were all below 0.05% methane by volume. As such, the site complied with ECA Condition 8 (1a, b, and c) which specifies:

- The concentration of methane gas below ground surface at the property boundary must be less than 2.5 % methane by volume.



- The concentration of methane gas must be less than 1.0% methane by volume in any on-site buildings or enclosed structures (i.e., office, and waste storage building).
- The concentration of methane gas from the Site must be less than 0.05 % methane by volume in any off-site building or enclosed structures, and in the area immediately outside the foundation or basement floor of the building or structure, only if the location is accessible to any person, contains electrical equipment, or a potential source of ignition.

4.5 Adequacy of Monitoring Program

It is Cambium's opinion that the existing monitoring program requires modification to sufficiently address current conditions at the Site. As outlined below, Cambium recommends that the environmental monitoring program be modified to focus on surface water influences in the area southeast of the Site and reduce the assessment on bedrock groundwater quality.

The reasons for this are as follows:

- Site related impacts were generally stable in the overburden/upper and lower bedrock aquifers. Furthermore, natural attenuation is occurring since LIP concentrations decrease with distance from the waste mound.
- Groundwater is interpreted to discharge to surface in the areas south/southeast of the Site. This has already been established at wells TW07 and TW09. As such, the Site is considered to meet the intent of Guideline B-7. Assessing Site compliance by referencing Guideline B-7 is not considered appropriate.
- Continued monitoring of the bedrock wells is not considered relevant to the Site compliance assessment since groundwater is interpreted to discharge to surface in the areas south and east of the Site. Further, the water quality reported from the bedrock wells is generally always of better quality than an adjacent overburden well.
- There are several overburden wells included in the monitoring program that provide redundant information (such as wells TW02-2 and TW11-2). Continued monitoring of these wells is not considered relevant to Site compliance assessment.



- Negligible leachate influences have been reported at wells TW09-1 and TW09-2. Continued monitoring of these wells is not considered relevant to Site compliance assessment.
- The concentration of boron reported at well TW07-2 is steadily increasing. As outlined below, Cambium recommends that a shallow drivepoint piezometer be installed in the area east of well TW07-2 to confirm water quality. Cambium recommends that a temporary, accelerated, monitoring program be enacted on the newly proposed well as a contingency plan to gather water quality information. The accelerated monitoring program will be separate from the approved monitoring program outlined herein (and separate from the proposed reductions to the established monitoring program).
- Influences at the farthest downstream surface water location SW1 (identified by the Ministry as the primary downstream trigger location) were minimal and the site-specific trigger was not activated in 2021. It is noted that elevated concentrations of some LIPs have been reported at station SW1 on occasion, however elevated concentrations of these same parameters have also been reported from the background monitoring station SW8. As such, the elevated concentrations of LIPs reported at station SW1 (when reported) may not be solely due to influences from the Site.
- The surface water sampling stations that regularly report an influence from landfill leachate (SW3 and SW6) are generally dry in the summer and fall. Samples from these stations are usually only collected once a year in the spring. Many sampling results collected at these stations are considered to have been influenced by poor sampling conditions and/or outside influences (i.e., road de-icing activities).
- Landfill gas readings are stable.

In consideration of the above, Cambium proposes the following amendments to the established environmental monitoring program:

(Note: Items 1 through 8 do not include the proposed contingency plan to address rising boron concentrations at well TW07-2. Those details are outlined in item 9 and should be enacted in parallel with the proposed reductions to the approved monitoring program in the ECA.)



1. Groundwater, surface water, and landfill gas monitoring frequencies should be reduced to once annually (to be completed in the spring).
2. Groundwater samples should only be collected from the following shallow wells: TW05-2, TW06-2, TW07-2, TW08-2, and TW10-2. All other monitoring wells should be removed from the monitoring program.
3. The shallow wells should be analyzed for those parameters outlined in Column 4, Schedule 5 of the Landfill Standards (in addition to barium, boron, manganese, sodium, and hardness).
4. Groundwater levels should be measured from clustered wells TW05, TW06, TW07, TW08, and TW10.
5. Surface water samples should only be collected from stations SW1 and SW8. Stations SW3 and SW6 should be removed from the monitoring program.
6. The surface water samples should be analyzed for those parameters outlined in Column 4, Schedule 5 of the Landfill Standards (in addition to barium, boron, manganese, sodium, and hardness).
7. Cambium recommends that the reporting frequency be reduced from once annually to once every two years.
8. Ministry Guideline B-7 should not be referenced to determine the compliance status of the Site since there is evidence that groundwater discharges to surface in the areas off-site to the southeast of the waste mound. Site compliance can be monitored by the use of the exiting surface water trigger mechanism.

Cambium recommends that the following contingency plan be implemented to address the increasing concentrations of boron reported at well TW07-2. The contingency plan includes installing a shallow drivepoint piezometer and completing a temporary, accelerated, monitoring program that will be established outside of recommended monitoring program described above. The proposed contingency plan is as follows:

9. A shallow drivepoint piezometer should be installed in the area east of well TW07-2. The shallow drivepoint piezometer will be installed in such a fashion that it monitors shallow



groundwater conditions southeast of the Site in areas where groundwater is interpreted to discharge to surface. Establishing a new surface water sampling station southeast of the Site is not considered appropriate since local conditions do not allow for sustained surface water sampling stations that can provide representative samples (i.e., conditions are almost always ponded or dry). An accelerated monitoring program should be enacted at the newly installed drivepoint piezometer to confirm water quality conditions (specifically boron concentrations). Cambium recommends that samples from the new shallow drivepoint piezometer be collected three times annually for three years. In addition, samples should be collected from SW1 and SW8 three times a year to confirm up and down-gradient conditions. Samples should be analyzed for the parameter outlined in Column 4, Schedule 5 of the Landfill Standards (in addition to barium, boron, manganese, sodium, and hardness). A brief letter report will be submitted to Ministry on or before December 31 of the first full monitoring year (and by December 31 of every year thereafter) outlining the results of the temporary, accelerated sampling program. The letter reported will be prepared as a separate document from the annual monitoring report. The need to continue the accelerated monitoring program or proceed with other contingency plans and/or mitigation measures should be reviewed during and at the end of the three year monitoring period. The drivepoint piezometer can be installed with the use of hand tools. The groundwater levels in the area east of well TW07-2 are estimated to be approximately 1 mbgs, as such the shallow drivepoint piezometer likely does not need to be installed to a depth greater than 2 mbgs.

4.5.1 Summary of Proposed Monitoring Program Changes

In summary, many aspects of the established monitoring program are considered redundant and/or unnecessary to determine Site compliance (i.e., sampling of deep bedrock monitoring wells, sampling of surface water stations SW3 and SW6, etc.). The proposed changes outlined herein include removal of redundant aspects of the established monitoring program.

Cambium has also identified potential compliance issues that could influence surface water receivers downstream of the Site to the southeast (i.e., increasing concentration of boron at well TW07-2). Therefore, in addition to the proposed modifications of the established



monitoring program, a contingency plan that includes installing a shallow drivepoint piezometer and an accelerated (temporary) monitoring program is also proposed.

In Cambium's opinion, the reductions to the established monitoring program, and the proposed contingency plan should be completed in parallel, at the same time. The need for continued monitoring of the newly installed drivepoint piezometer, and any other mitigation measures to account for increasing boron concentrations in the areas southeast of the Site will be determined during and after the completion of the accelerated (temporary) monitoring program.

The groundwater, surface water, and landfill gas monitoring and reporting will continue to be completed as detailed in Table 1 until such time as approval has been granted from the District Manager and ultimately the Director as detailed in ECA Condition 8 (17).



5.0 Site Operations

As previously mentioned in Section 1.2, the Site is owned by the Township but the property is leased by Waste Connections for the operation of a waste transfer station. The Ministry inspection noted that Waste Connections replaced M&M Disposal Services (1017492 Ontario Limited) in 2018 but the Ministry has no correspondence on-file about this change as required by ECA Condition 1 (11, b). As such, the Township notified the Ministry about the change of operators in an email dated June 24, 2021 (Appendix C).

This section presents a summary of the 2021 site operations. More specifically, this section details the requirements specified in ECA Condition 6 (8).

- A monthly summary of the type and quantity of all incoming and outgoing waste. This includes the source of incoming waste and the destination of outgoing waste (Section 5.7 and Appendix I).
- Any environmental or operational problems that could negatively impact the environment encountered during the operation of the Transfer Station and Site inspections, and any mitigative actions taken (Section 5.4).
- Any changes to Site documentation that has been approved by the Director since the last Annual Report (Section 5.8).
- Any recommendations to minimize environmental impacts or improve operations at the Site (Section 5.4).

5.1 Site Access and Security

The Site is not visible from County Road 6 as it is well screened by surrounding trees and thick vegetation. A lockable gate at the entrance controls access. Signage is posted at the gate which lists the hours of operation, the owner and operator, acceptable materials, a warning against illegal dumping, contact information for Waste Connections. An additional sign at the Site entrance was installed in 2021 as a result of the Ministry inspection to include the ECA number, prohibited waste types, and emergency and complaint contact information



(Appendix C). Following the installation of the secondary signage in 2021 the entrance signs met the requirements of ECA Condition 2 (2).

The Site is approved to accept waste generated within the boundaries of the County of Northumberland, the County of Peterborough, the City of Kawartha Lakes, the Regional Municipality of Durham, the County of Haliburton, and the County of Hastings. A site attendant is present during the hours of operation.

The hours of operation in 2021 were:

Year Round

Monday to Friday:..... 7:00 AM to 5:00 PM

5.2 Site Operations

In 2021, all transfer operations were conducted under the supervision and direction of the site attendant, employed by the Waste Connections. 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. The site attendant’s responsibilities included, but were not limited to the following:

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

Most of the incoming waste is from residential and light commercial construction sites within a 100 km radius of the Site. The waste is transported to the Site by licensed haulers. There are two main staging areas at the Site: one area is used for the collection and sorting of Construction and Demolition (C&D) materials, and the other is a tent with concrete pad for the collection of industrial, commercial, and institutional (IC&I) waste.

A sorting machine is used for the C&D materials, and any particles smaller than 5 cm are separated and sent to the Peterborough Waste Management Facility (Bensfort Road Landfill)



for disposal. All incoming C&D materials that is deemed residual is stockpiled on the north end of the Site and transferred daily. The remaining C&D materials are chipped on-site daily and removed. An occasional stockpile of chipped materials will be present when the amount of waste processed is outpacing the volume of material hauled off-site. This generally occurs from May to October when the Site is busier.

Waste collected at the Site is temporarily stored and transferred daily to the Peterborough Waste Management Facility by licensed haulers. Scrap metal and concrete is segregated from incoming waste upon arrival.

5.3 Training

Waste Connection ensures that all staff operating the Site are properly trained for the tasks they are expected to perform. In 2021, training including details of the ECA and appropriate legislation, waste screening procedures, nuisance control measures, Occupational Health and Safety, equipment use, and emergency procedures.

5.4 Site Inspections

This section discusses observations during site inspections conducted by Cambium, the Ministry, and Waste Connections in 2021.

In 2021, Waste Connections staff completed routine weekly inspections of the Transfer Station area as required by ECA Condition 6 (3). Records of the inspections were kept on-site in a logbook as required by ECA Condition 6 (5). During the Ministry inspection it was noted that although a logbook is being kept identifying that the inspections were being completed, it does not specifically specify which areas are being inspected. As such, a detailed site inspection form was created and submitted to the Ministry for review. Refer to Appendix C for a copy of the site inspection form.

Cambium staff conducted the required inspections to be completed in conjunction with the environmental monitoring in 2021 as detailed in ECA Condition 6 (4). The areas inspected are discussed in the following subsections.



The Ministry inspection noted that an on-site fuel tank, centrally located on the top of the eastern slope, was precariously supported with rocks, and was sitting on the ground. In response, the fuel tank was inspected by the Township and the installation area was graded and protective barriers were installed to protect the fuel tank from vehicle traffic. Furthermore, the Township informed the Ministry that the fuel tank is double walled (Appendix C)

Ministry inspection notes indicated that no nuisance pests were observed, that the driveway is swept to reduce dust, wood processing only occurs between 8:00 am to 5:00 pm, on-site equipment is relatively quiet, and there were no noticeable odours. As such, the Site is not causing nuisance effects to the surrounding properties.

5.4.1 Litter Control

During the 2021 monitoring events, Cambium staff observed litter on the eastern slope of the waste mound and into the adjacent treeline. A litter control fence is installed on the eastern slope of the waste mound to prevent the migration of windblown litter. Waste Connections reported that inspections for blown litter are conducted daily and clean up of blown litter is only completed when required.

During the Ministry inspection it was noted that the scrap metal bin was overflowing. Although this is not a compliance issue, it is recommended that scrap metal be managed in an appropriate manner. In response, the scrap metal was relocated to a concrete pad with walls for placement until the material is ready to be shipped (Appendix C).

The intent of good housekeeping practices is to protect the health and safety of Site users, to protect the surrounding environment from nuisance effects, and to minimize these nuisance effects by adopting 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.

5.4.3 Final Cover Integrity

A significant amount of time has passed since final closure activities in 2005 allowing for the vegetation cover to become well established. During the 2021 site visits, Cambium field staff noted that the vegetative cover was well established with no exposed waste observed. Minor orange staining was noted during the spring event, indicative of a leachate seep, east of TW4-2. This location should be inspected in 2021 to confirm the presence of a leachate seep and to determine if further action is warranted. As the vegetative cover is now established, the cover integrity is not expected to deteriorate. No post-closure repairs or maintenance was completed in 2021.

The integrity of the final cover should continue to be inspected in conjunction with the monitoring events and any evidence of erosion or leachate seeps should be addressed immediately.

5.5 Complaint and Incidents

Waste Connections reported there were no complaints or incidents at the Site in 2021.

5.6 Monitoring Well Security

All monitoring wells listed in Table 1 were inspected by Cambium personnel in 2021 for compliance with R.R.O. 1990 Regulation 903 – Wells (Reg.903). All monitoring wells received new padlocks in the autumn. As such, the wells complied with Reg. 903. Refer to Appendix F for photographs of the inspected monitoring wells.



5.7 Materials Summary

The following waste types are accepted at the Site. Refer to Figure 3 for the collection location of each material.

- IC&I solid non-hazardous waste
- C&D Materials
- Scrap Metal

ECA Condition 7 (5, 6, and 7) specifies the amount of waste permitted at the Site as followed:

- No more than 800 tonnes of dry waste per day shall be accepted at the Site.
- No more than 1,700 tonnes (6,400 m³) of dry waste, residual waste, and processed materials shall be stored at the Site at any time.
- The total amount of residual and IC&I waste leaving the Site shall not exceed 300 tonnes per day.

5.7.1 Site Usage

Site usage, as documented by the Waste Connections, is summarized in Embedded Table 5. More specifically, a monthly summary of all incoming and outgoing waste, and the hauling destination is provided in Appendix I. As reported by the Township, a new full length truck scale was installed in April 2021 to increase accuracy when weighing inbound/outbound vehicles.

Embedded Table 5 Summary of Site Usage

	2021
IC&I and Residual Waste	35,542.53 tonnes
C&D Materials	11,801.95 tonnes
Wood ¹	454.99 tonnes

Notes:

1. Wood is hauled off-site to BioMass in Gatineau, Quebec to be used as fuel.



5.7.2 Material Diversion

Embedded Table 6 provides a summary of materials diverted at the Site, as provided by Waste Connections.

Embedded Table 6 Summary of Site Usage

	2021
Leaf and Yard Waste	113.56 tonnes
Scrap Metal	71.27 tonnes

5.8 Site Documentation Reviews and Updates

The documents listed below are maintained by the Township and updated as required.

- Stoney Lake Road Landfill Site Transfer Station, Processing Site. Design, Operations and Maintenance Report (DOP) (Geo-Logic, 2014)
- Closure Plan, Stoney Lake Road (North) Waste Disposal Site (LR, 2000)
- Emergency Response Plan

The Ministry inspection report noted that there was no indication that the DOP has been updated since 2014. Furthermore, a copy of this document should be stored on-site (Appendix C). In response, the Township updated operator and emergency contact information and provided a copy of the DOP to be stored at the Site. Refer to Appendix C for further details.

5.9 Compliance with Ministry Approval

Following the inspection, the Township of Douro-Dummer and Waste Connections completed the necessary requirements to ensure compliance with the ECA in 2021.



6.0 Conclusions

Based on the 2021 monitoring program, Cambium offers the following conclusions regarding the Stoney Lake Road Landfill.

- Groundwater flow beneath the Site in the overburden/upper bedrock and lower bedrock aquifer is to the southeast. The conceptual model for the Site indicates leachate impacted groundwater discharges to the unevaluated wetlands and Galesburg PSW to the southeast.
- A leachate plume is evident beneath and down-gradient the waste mound. Impacts were generally restricted to the overburden/upper bedrock aquifer. Natural attenuation is occurring at the Site as concentrations generally decrease with distance away from the waste mound. No impacts were apparent at the farthest down-gradient off-site monitors.
- An increasing trend for boron is evident at monitoring well TW07-2. No boron impacts have been observed at the closest down-gradient surface water location SW1 at this time.
- Numerous RUC exceedances were reported at the down-gradient overburden/upper bedrock and lower bedrock monitoring wells. Given that groundwater is anticipated to discharge to surface down-gradient of the waste mound, the intent of Ministry Guideline B-7 is satisfied.
- The surface water quality down-gradient of the waste mound has not been impacted by waste disposal operations. Where elevated concentrations were observed these can be attributed to poor sampling conditions (i.e., shallow, and stagnant) and/or outside influences (i.e., road de-icing activities, and wetland environments). The surface water trigger was not activated in 2021 and no further action was warranted.
- All landfill gas measurements at the perimeter monitoring wells were less than 2.5% methane by volume in 2021. Furthermore, landfill gas measurements conducted at the on-site structures were less than 1.0% methane by volume.
- The property is owned by the Township and leased to Waste Connections. About 35,500 tonnes of IC&I and Residual waste, 11,800 tonnes of C&D materials, and 450 tonnes of wood was received at the Site in 2021.



- Site inspections completed by Cambium in 2021 noted that the vegetation on the waste mound was well established with no evidence of erosion. Minor orange staining was observed near the toe of the waste mound indicative of a leachate seep.
- A Ministry site inspection completed on December 11, 2020 noted numerous deficiencies. Following the inspection, the Township of Douro-Dummer and Waste Connections completed the necessary requirements to ensure compliance with the ECA in 2021.

6.1 Recommendations

Many aspects of the established monitoring program are considered redundant and/or unnecessary to determine Site compliance (i.e., sampling of deep bedrock monitoring wells, sampling of surface water stations SW3 and SW6, etc.). The proposed changes outlined herein include removal of redundant aspects of the established monitoring program.

Cambium has also identified potential compliance issues that could influence surface water receivers downstream of the Site to the southeast (i.e., increasing concentration of boron at well TW07-2). Therefore, in addition to the proposed modifications of the established monitoring program, a contingency plan that includes installing a shallow drivepoint piezometer and an accelerated (temporary) monitoring program is also proposed.

In Cambium's opinion, the reductions to the established monitoring program, and the proposed contingency plan should be completed in parallel, at the same time. The need for continued monitoring of the newly installed drivepoint piezometer, and any other mitigation measures to account for increasing boron concentrations in the areas southeast of the Site will be determined during and after the completion of the accelerated (temporary) monitoring program.

The groundwater, surface water, and landfill gas monitoring and reporting will continue to be completed as detailed in Table 1 until such time as approval has been granted from the District Manager and ultimately the Director as detailed in ECA Condition 8 (17).



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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 or 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
m³	cubic metre	max	maximum
m²	square metre		



Standard Limitations

Limited Warranty

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Appended Figures

Fully accessible appended figures are available upon request.

**2021 ANNUAL REPORT
STONEY LAKE
ROAD LANDFILL**
THE CORPORATION OF THE
TOWNSHIP OF DOURO - DUMMER
348 County Road 6
Lakefield, Ontario

LEGEND

-  Highway
-  Major Road
-  Railroad
-  Watercourse
-  Water Area
-  Provincial Park
-  Wooded Area
-  Built Up Area
-  Lower Tier Municipality

Notes:
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.



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REGIONAL LOCATION PLAN

Project No.:	12987-004	Date:	March 2022
Scale:	1:300,000	Rev.:	
Created by:	TLC	Projection:	NAD 1983 UTM Zone 17N
Checked by:	CM	Figure:	1



O:\GIS\MapDocs\12987\12987-004_TDD - Stoney Lake\2022-01-05 FIG. 1 - Regional Location Plan.mxd

**2021 ANNUAL REPORT
STONEY LAKE
ROAD LANDFILL**
THE CORPORATION OF THE
TOWNSHIP OF DOURO - DUMMER
348 County Road 6
Lakefield, Ontario

LEGEND

-  Water Well Record
-  Surface Water Location
-  Culvert
-  Major Road
-  Minor Road
-  Watercourse, Permanent
-  Contour 5m Interval (Major)
-  Contour 5m Interval (Minor)
-  Unevaluated Wetlands
-  Provincially Significant Wetlands
-  Water Area
-  Wooded Area
-  Site (approximate)
-  Landfill Footprint (approximate)

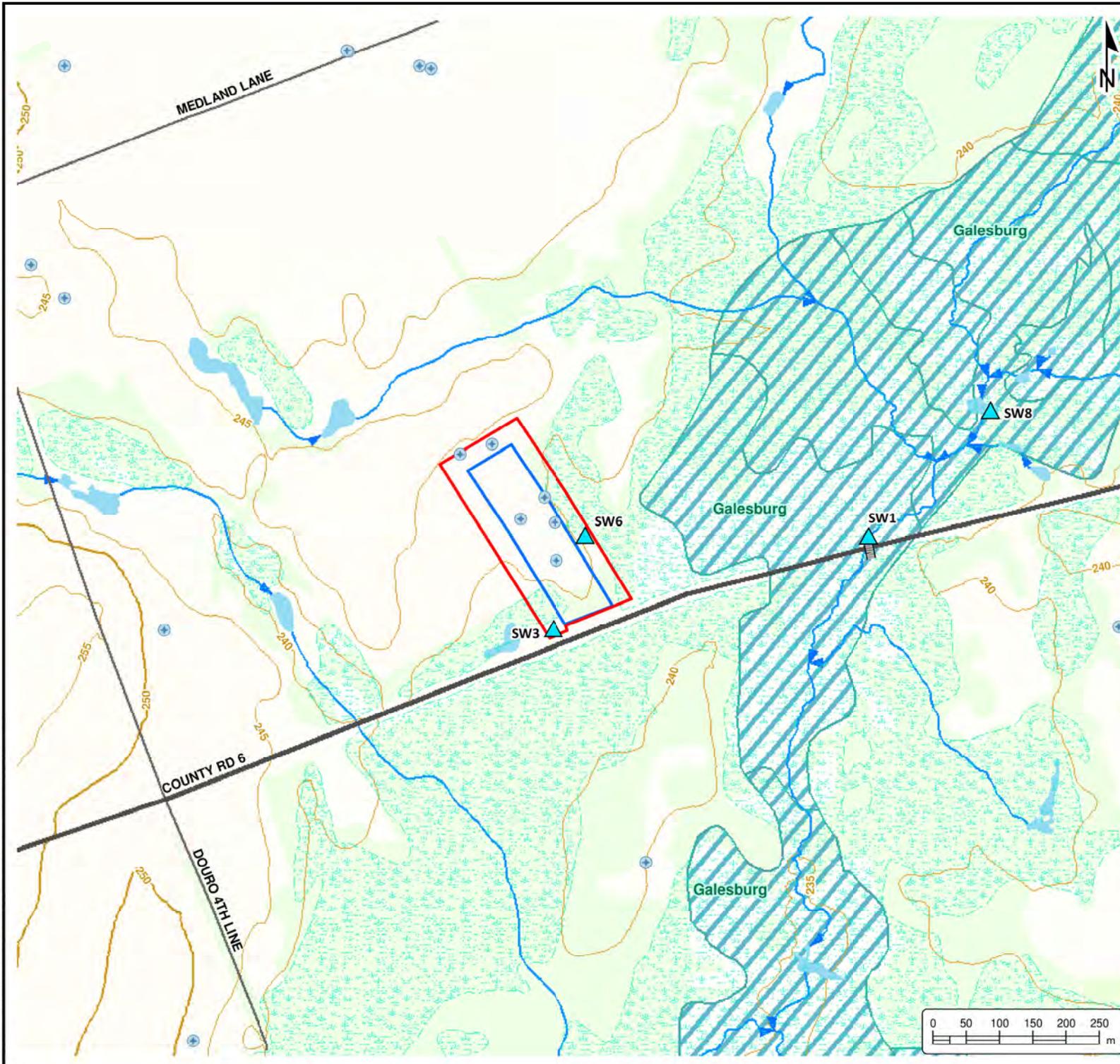
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LOCAL TOPOGRAPHY PLAN

Project No.:	12987-004	Date:	March 2022
Scale:	1:8,000	Rev.:	
Created by:	TLC	Projection:	NAD 1983 UTM Zone 17N
Checked by:	CM	Figure:	2

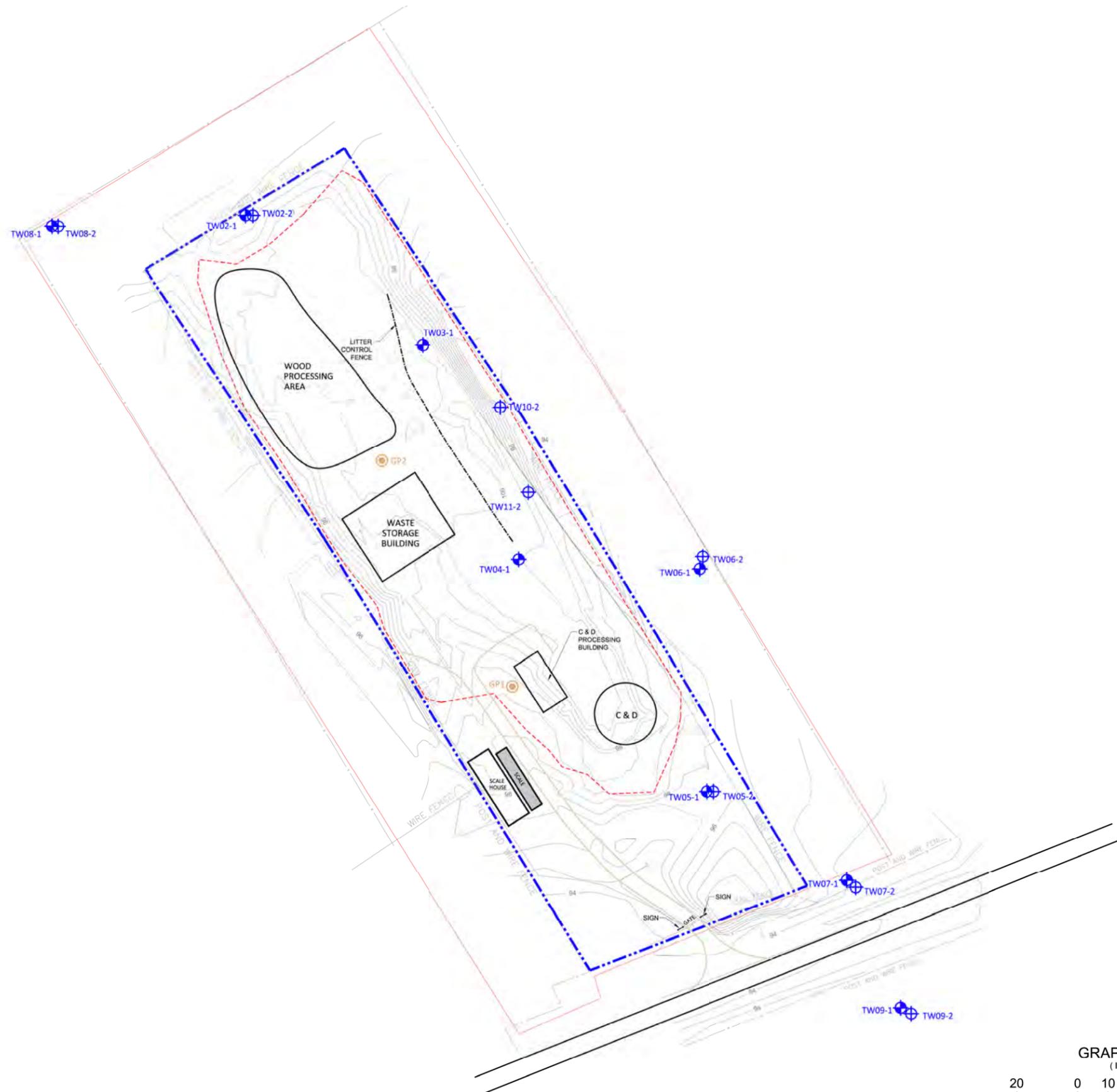


O:\GIS\MapDocs\12987-004_TDD - Stoney Lake\2022-01-05 FIG 2 - Local Topography Plan.mxd



LEGEND

- Shallow Bedrock Test Well
- Deep Bedrock Test Well
- Gas Probe
- Topographic Contour
- On-Site Road
- Site (approximate)
- Landfill Footprint (approximate)
- Limit of Waste (approximate)

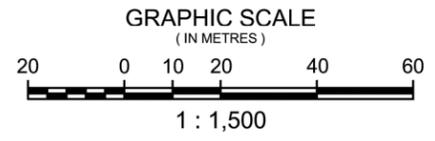


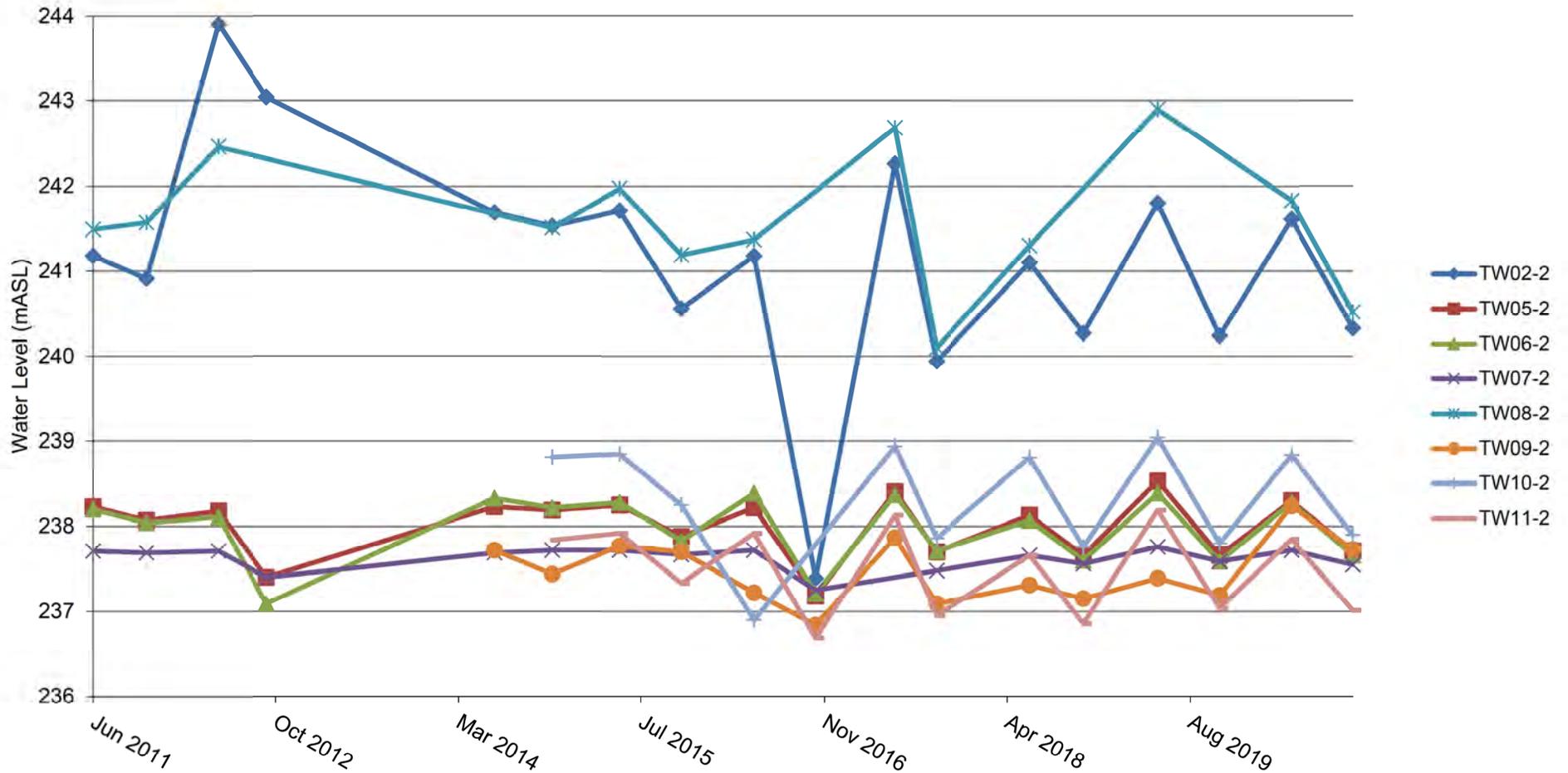
Notes:
 1. Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.

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EXISTING CONDITIONS

Project No.: 12987-004	Date: February 2022
Horizontal Scale: 1:1,500	Rev.: Projection: UTM Zone 17N
Drawn By: TLC	Checked By: CM
Figure: 3	



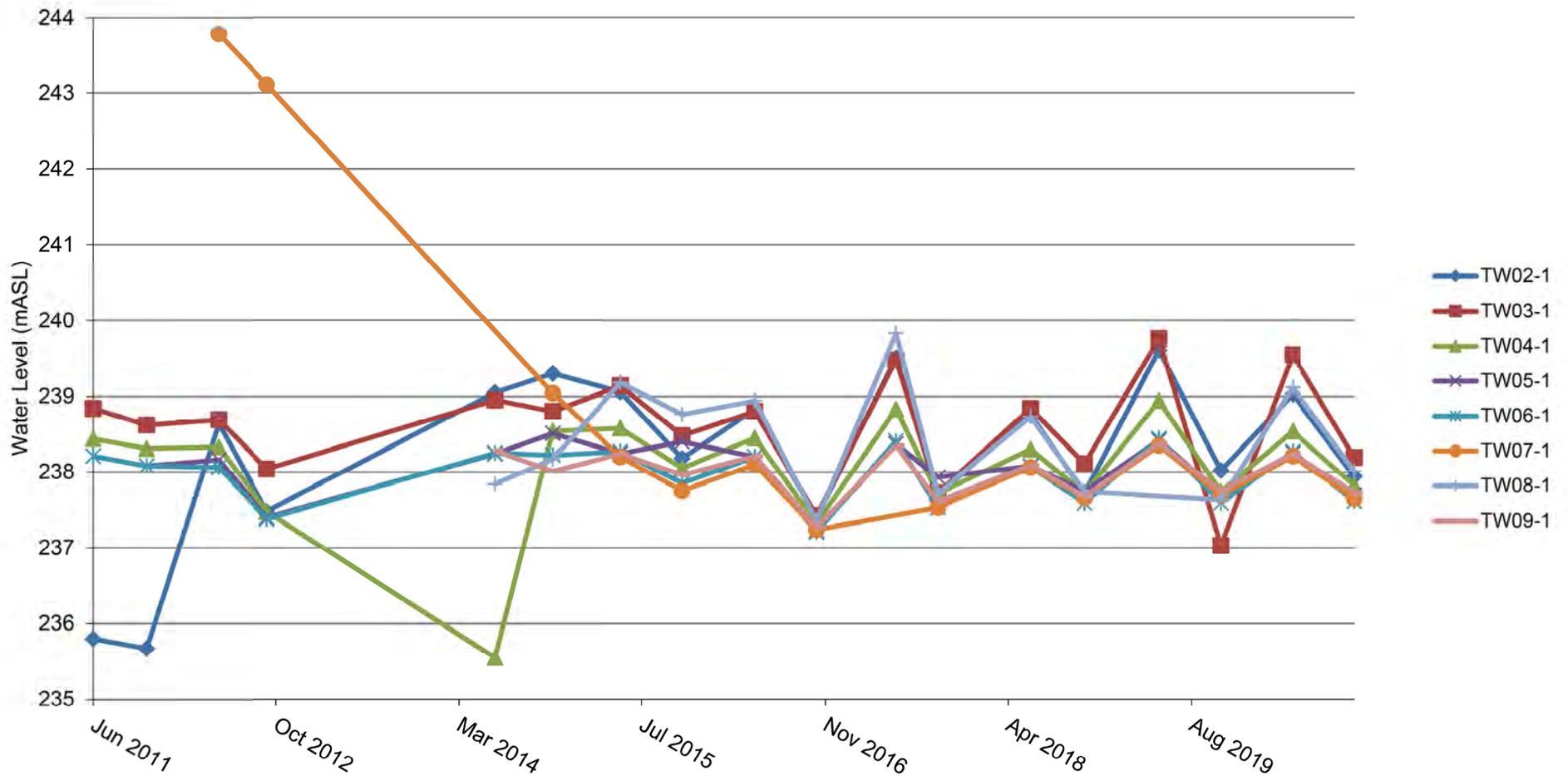


Groundwater Elevations - Overburden/Upper Bedrock

2021 Annual Report, Stoney Lake Road Landfill
 348 County Road 6, Lakefield
 The Corporation of the Township of Douro-Dummer

Figure:	4
Date:	8-Apr-22
Project Manager:	Cameron MacDougall
Project No.:	12987-004





Groundwater Elevations - Lower Bedrock

2021 Annual Report, Stoney Lake Road Landfill
 348 County Road 6, Lakefield
 The Corporation of the Township of Douro-Dummer

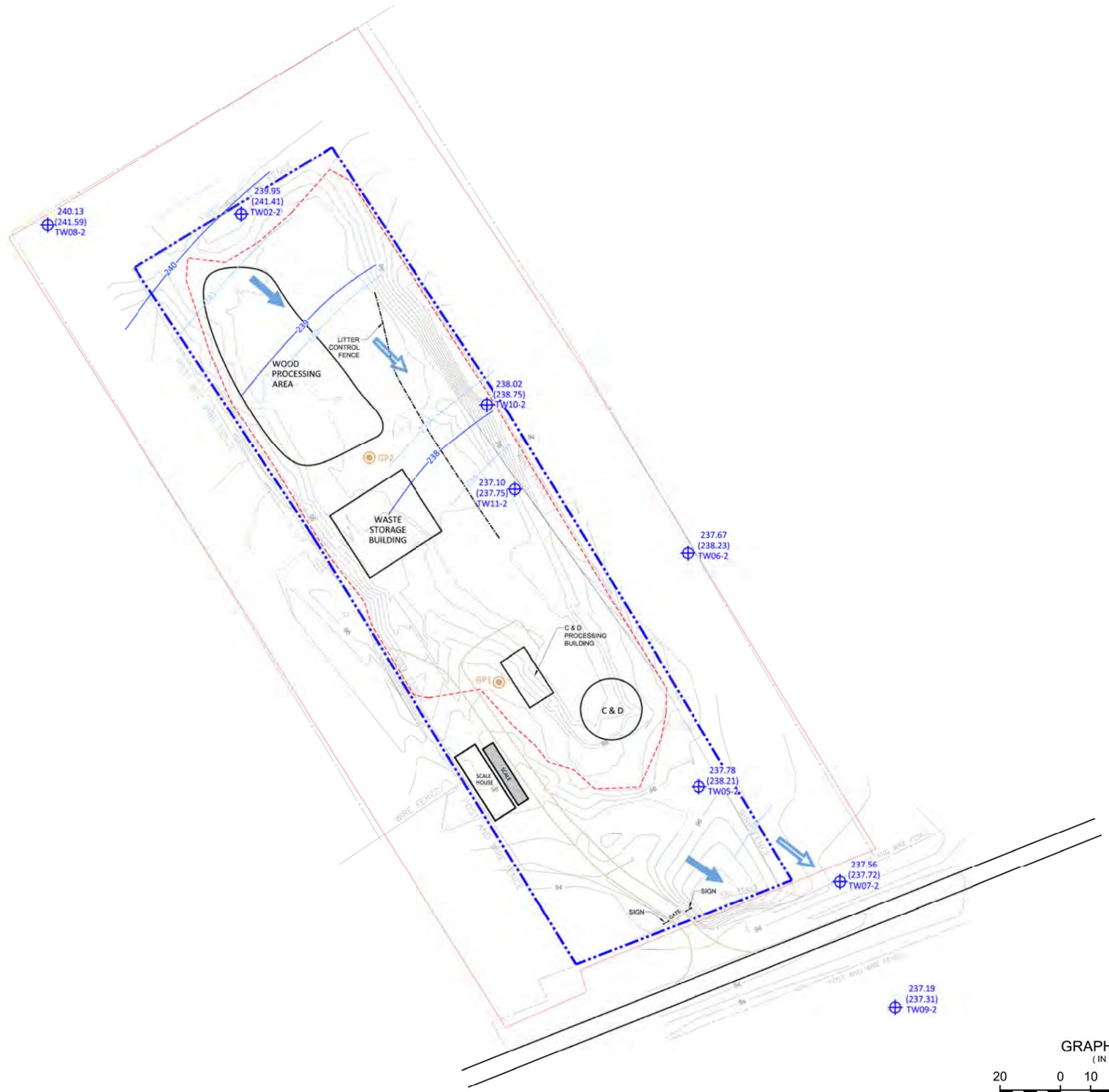
Figure:	5
Date:	8-Apr-22
Project Manager:	Cameron MacDougall
Project No.:	12987-004





LEGEND

-  Shallow Bedrock Test Well
-  Gas Probe
-  237.97 Groundwater Elevation June 28, 2021
-  (239.02) Groundwater Elevation November 10, 2021
-  Topographic Contour
-  Groundwater Contour June 28, 2021
-  Groundwater Contour November 10, 2021
-  On-Site Road
-  Site (approximate)
-  Landfill Footprint (approximate)
-  Limit of Waste (approximate)
-  Groundwater Flow Direction June 28, 2021
-  Groundwater Flow Direction November 10, 2021



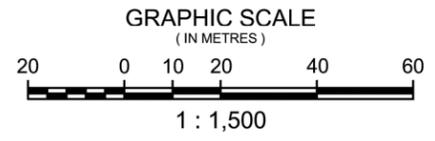
Notes:
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GROUNDWATER CONFIGURATION
 OVERBURDEN/UPPER BEDROCK

Project No.: 12987-004	Date: February 2022
Horizontal Scale: 1:1,500	Rev.: Projection: UTM Zone 17N
Drawn By: TLC	Checked By: CM
Figure: 6	

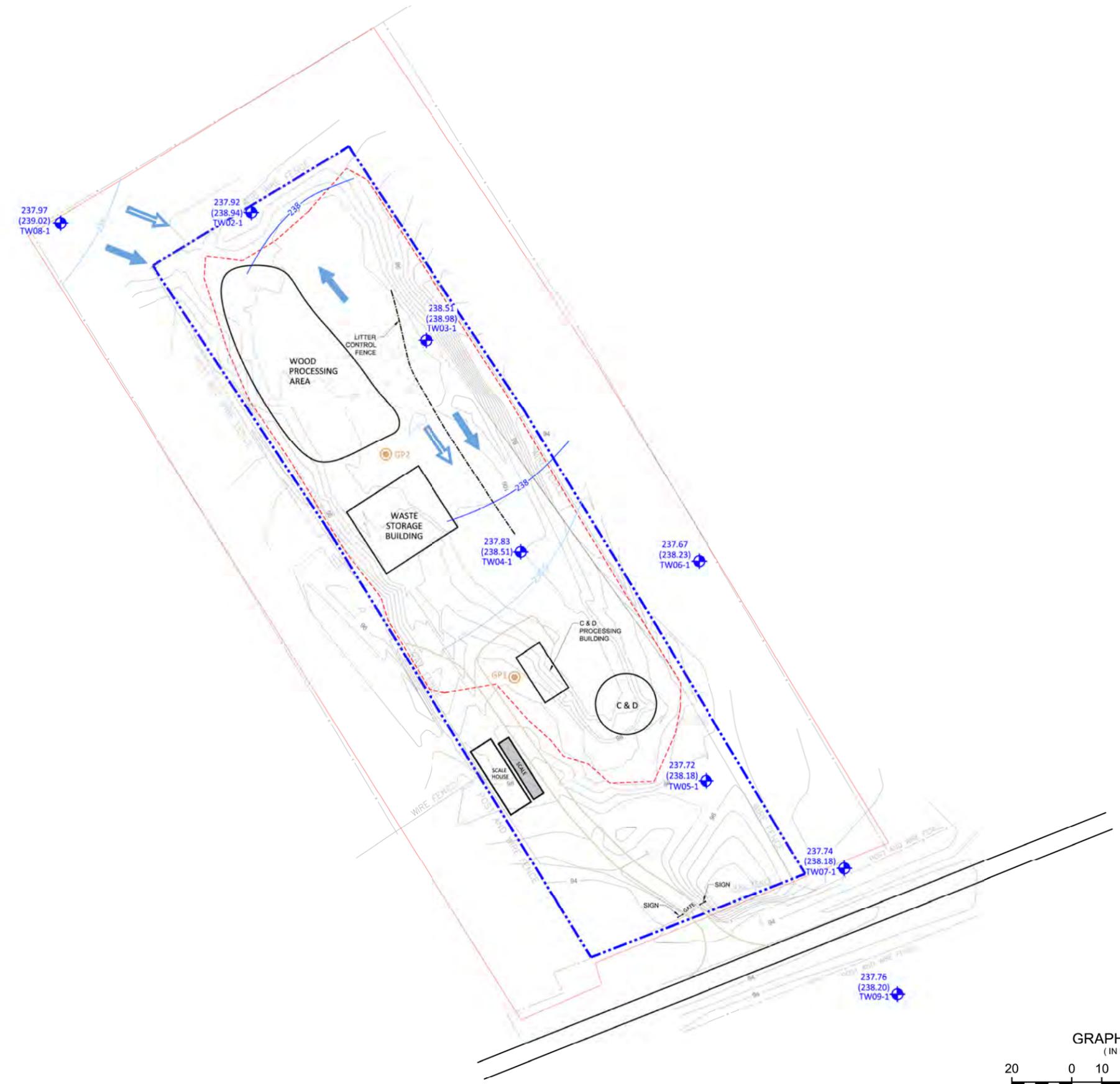


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LEGEND

- Deep Bedrock Test Well
- Gas Probe
- 237.97 Groundwater Elevation June 28, 2021
- (239.02) Groundwater Elevation November 10, 2021
- Topographic Contour
- Groundwater Contour June 28, 2021
- Groundwater Contour November 10, 2021
- On-Site Road
- Site (approximate)
- Landfill Footprint (approximate)
- Limit of Waste (approximate)
- Groundwater Flow Direction June 28, 2021
- Groundwater Flow Direction November 10, 2021

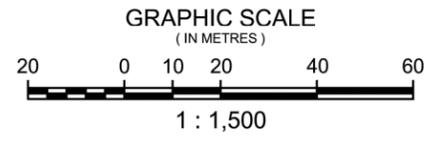


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GROUNDWATER CONFIGURATION
 LOWER BEDROCK

Project No.: 12987-004	Date: February 2022
Horizontal Scale: 1:1,500	Projection: UTM Zone 17N
Drawn By: TLC	Checked By: CM
Figure: 7	





Appended Tables

Fully accessible appended tables are available upon request.



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 cadmium, copper, and lead depends on hardness

"-" Parameter not analyzed or measured

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



Table 1 Groundwater and Surface Water Monitoring Program

Location	Task	Frequency	Analytical Parameters
Groundwater			
TW02-2, TW05-2, TW06-2, TW07-2, TW08-2, TW09-2, TW10-2, TW11-2 1 QA/QC Duplicate	<ul style="list-style-type: none"> Measure groundwater levels Groundwater sampling Field measurements (pH, temperature, ORP, conductivity) 	Twice Annually (Spring & Autumn)	alkalinity, ammonia, arsenic, barium, boron, cadmium, chloride, chromium, conductivity, copper, iron, lead, manganese, mercury, nitrite, nitrate, TKN, pH, total phosphorus, TSS, TDS, sulphate, sodium, zinc, BOD, COD, phenols, hardness
TW02-1, TW03-1, TW04-1, TW05-1 1 QA/QC Duplicate	<ul style="list-style-type: none"> Measure groundwater levels Groundwater sampling Field measurements (pH, temperature, ORP, conductivity) 	Twice Annually (Spring & Autumn)	alkalinity, ammonia, barium, boron, calcium, chloride, conductivity, iron, manganese, magnesium, nitrate, pH, sodium, TDS, sulphate, COD, DOC, phenols, hardness
TW06-1, TW07-1, TW08-1, TW09-1	<ul style="list-style-type: none"> Measure groundwater levels Groundwater sampling Field measurements (pH, temperature, ORP, conductivity) 	Twice Annually (Spring & Autumn)	alkalinity, ammonia, arsenic, barium, boron, cadmium, calcium, chloride, chromium, conductivity, copper, iron, lead, magnesium, manganese, mercury, nitrite, nitrate, TKN, pH, total phosphorus, potassium, sodium, TDS, sulphate, zinc, COD, DOC, phenols, hardness Benzene, 1-4- Dichlorobenzene, Dichloromethane, Toluene, Vinyl Chloride
TW02-2, TW06-2 1 QA/QC Duplicate	<ul style="list-style-type: none"> VOCs 	Twice Annually (Spring & Autumn)	See List Below
All Wells (listed above) Gas Probes (GP1, GP2) On-site structures (Office, and Sorting Building)	<ul style="list-style-type: none"> Landfill Gas Measurements 	Twice Annually (Spring & Autumn)	CH4 and H2S
Surface Water			
SW1, SW3, SW6, SW8 1 QA/QC Duplicate	<ul style="list-style-type: none"> Surface water sampling Flow estimates Field measurements (pH, temperature, conductivity, ORP, dissolved oxygen) 	Three Times Annually (Spring, Summer, & Autumn)	alkalinity, ammonia, arsenic, barium, boron, cadmium, chloride, chromium, conductivity, copper, iron, lead, calcium, manganese, magnesium, potassium, sodium, dissolved mercury, nitrite, nitrate, TKN, pH, total phosphorus, TSS, TDS, sulphate, zinc, BOD, COD, phenols, hardness, unionized ammonia (field)

*Dissolved mercury to be lab filtered with a 0.45 micron filter for all surface water samples.



VOCs to be analyzed

Bromodichloromethane
Bromoform
Dibromochloromethane
Bromomethane
Carbon tetrachloride
Chloroethane
Chloroform
Chloromethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene
1,2-Dichloropropane
trans-1,2-Dichloroethene
cis-1,2-Dichloroethene
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Ethylenedibromide
Dichloromethane
Monochlorobenzene
Styrene
1,1,2,2-Tetrachloroethane
Tetrachloroethene
Trichloroethylene
Vinyl Chloride
Trichlorofluoromethane
1,1,1-Trichloroethane
1,1,2-Trichloroethane
1,1,1,2-Tetrachloroethane



Table 2: Groundwater Elevations

Monitor	UTM Zone 17		Top of Casing Elevation (m)	Ground Elevation (m)	Measured Stick-Up (m)	Well Depth (m)	Screened Unit	Water Level Elevation (mASL)									
	Northing	Easting						07-Jun-11	31-Oct-11	15-May-12	24-Sep-12	09-Jun-14	14-Nov-14	19-May-15	03-Nov-15	19-May-16	03-Nov-16
TW02-1	4926781	720806	245.05	244.50	0.55	9.78	Hard Grey Limestone Bedrock	235.8	235.67	238.64	237.48	239.05	239.3	239.06	238.18	238.83	237.39
TW02-2	4926780	720808	245.16	244.41	0.75	6.87	Limestone Bedrock, Hard Grey Limestone Pebbles	241.18	240.91	243.90	243.04	241.69	241.53	241.71	240.56	241.18	237.39
TW03-1	4926738	720864	244.84	244.16	0.68	7.42	Grey Broken Limestone, Grey Limestone Pebbles	238.84	238.62	238.89	238.04	238.95	238.80	239.14	238.48	238.80	237.42
TW04-1	4926667	720896	245.74	245.64	0.10	11.13	Grey Broken Limestone	238.44	238.31	238.33	237.48	235.55	238.54	238.58	238.05	238.45	237.32
TW05-1	4926590	720958	241.40	240.43	0.97	7.97	Grey Broken Limestone	238.21	238.08	238.16	237.40	238.24	238.51	238.24	238.40	238.20	237.23
TW05-2	4926591	720960	241.40	240.43	0.97	5.75	Grey and Brown Sand, Broken Limestone Bedrock	238.23	238.07	238.18	237.40	238.23	238.19	238.25	237.88	238.22	237.10
TW06-1	4926664	720956	240.57	239.80	0.77	5.88	Fractured Limestone Bedrock	238.21	238.08	238.06	237.38	238.25	238.22	238.27	237.85	238.20	237.21
TW06-2	4926668	720957	240.35	239.55	0.80	4.08	Brown Sand, Fractured Limestone Bedrock	238.20	238.04	238.11	237.09	238.33	238.22	238.28	237.83	238.39	237.21
TW07-1	4926561	721004	239.66	238.77	0.89	10.03	Fractured Limestone Bedrock	-	-	243.78	243.11	-	239.04	238.20	237.75	238.10	237.24
TW07-2	4926559	721007	239.86	238.80	1.06	5.24	Grey Sand, Fractured Limestone Bedrock	237.71	237.69	237.71	237.40	237.69	237.72	237.72	237.67	237.72	237.25
TW08-1	4926777	720742	245.37	244.59	0.78	11.59	Fractured Limestone Bedrock	-	-	-	-	237.84	238.17	239.18	238.76	238.94	237.36
TW08-2	4926777	720744	245.34	244.54	0.80	5.33	Fractured Limestone Bedrock	241.49	241.57	242.46	-	-	241.51	241.97	241.19	241.37	-
TW09-1	4926519	721022	238.53	237.72	0.81	10.54	Limestone Bedrock	-	-	-	-	238.28	238.01	238.24	237.96	238.21	237.27
TW09-2	4926517	721026	238.20	237.18	1.02	4.29	Till	-	-	-	-	237.72	237.44	237.77	237.70	237.22	236.84
TW10-2	4926717	720890	241.20	240.38	0.82	3.78	-	-	-	-	-	-	238.81	238.85	238.25	236.90	-
TW11-2	4926689	720899	242.09	241.24	0.85	6.83	-	-	-	-	-	-	237.84	237.92	237.33	237.92	236.69



Table 2: Groundwater Elevations

Monitor	UTM Zone 17		Top of Casing Elevation (m)	Ground Elevation (m)	Measured Stick-Up (m)	Well Depth (m)	Screened Unit	Water Level Elevation (mASL)									
	Northing	Eastings						07-Jun-17	29-Sep-17	11-Jun-18	05-Nov-18	27-May-19	12-Nov-19	27-May-20	02-Nov-20	28-Jun-21	10-Nov-21
TW02-1	4926781	720806	245.05	244.50	0.55	9.78	Hard Grey Limestone Bedrock	239.51	237.69	238.76	237.72	239.61	238.02	239.03	237.94	237.92	238.94
TW02-2	4926780	720808	245.16	244.41	0.75	6.87	Limestone Bedrock, Hard Grey Limestone Pebbles	242.26	239.94	241.10	240.27	241.80	240.24	241.61	240.33	239.95	241.41
TW03-1	4926738	720864	244.84	244.16	0.68	7.42	Grey Broken Limestone, Grey Limestone Pebbles	239.48	237.72	238.84	238.11	239.76	237.03	239.55	238.19	238.51	238.98
TW04-1	4926667	720896	245.74	245.64	0.10	11.13	Grey Broken Limestone	238.83	237.71	238.30	237.72	238.94	237.74	238.54	237.82	237.83	238.51
TW05-1	4926590	720958	241.40	240.43	0.97	7.97	Grey Broken Limestone	238.37	237.93	238.08	237.74	238.42	237.71	238.25	237.69	237.72	238.18
TW05-2	4926591	720960	241.40	240.43	0.97	5.75	Grey and Brown Sand, Broken Limestone Bedrock	230.41	237.70	230.13	237.66	230.53	237.66	230.30	237.71	237.78	230.21
TW06-1	4926664	720956	240.57	239.80	0.77	5.88	Fractured Limestone Bedrock	238.41	237.53	238.07	237.59	238.44	237.59	238.27	237.61	237.67	238.23
TW06-2	4926668	720957	240.35	239.55	0.80	4.08	Brown Sand, Fractured Limestone Bedrock	238.37	237.71	238.07	237.60	238.39	237.59	238.28	237.66	237.67	238.23
TW07-1	4926561	721004	239.66	238.77	0.89	10.03	Fractured Limestone Bedrock	-	237.53	238.06	237.66	238.35	237.69	238.21	237.65	237.74	238.18
TW07-2	4926559	721007	239.86	238.80	1.06	5.24	Grey Sand, Fractured Limestone Bedrock	-	237.48	237.66	237.56	237.76	237.59	237.72	237.55	237.56	237.72
TW08-1	4926777	720742	245.37	244.59	0.78	11.59	Fractured Limestone Bedrock	239.83	237.71	238.73	237.74	-	237.63	239.12	238.01	237.97	239.02
TW08-2	4926777	720744	245.34	244.54	0.80	5.33	Fractured Limestone Bedrock	242.68	240.10	241.30	-	242.90	-	241.83	240.52	240.13	241.59
TW09-1	4926519	721022	238.53	237.72	0.81	10.54	Limestone Bedrock	236.35	237.61	238.09	237.67	238.38	237.75	238.24	237.73	237.76	238.20
TW09-2	4926517	721026	238.20	237.18	1.02	4.29	Till	237.87	237.09	237.31	237.15	237.39	237.19	237.33	237.17	237.19	237.31
TW10-2	4926717	720890	241.20	240.38	0.82	3.78	-	238.94	237.86	238.81	237.76	239.04	237.8	238.84	237.90	238.02	238.75
TW11-2	4926689	720899	242.09	241.24	0.85	6.83	-	238.13	236.95	237.66	236.86	238.19	237.04	237.85	237.01	237.10	237.75



Table 3: Vertical Gradients

Monitor	Screened Unit	Difference in Elevation of Bottom of Screen	Vertical Gradient (+ downward gradient, - upward gradient)			
			27-May-20	02-Nov-20	28-Jun-21	10-Nov-21
TW02-1	<i>Hard Grey Limestone Bedrock</i>	-3.02	0.85	0.79	0.67	0.82
TW02-2	Limestone Bedrock, Grey Limestone Pbbles					
TW05-1	<i>Grey Broken Limestone</i>	-2.22	0.02	0.01	0.03	-0.01
TW05-2	Grey and Brown Sand, Broken Limestone Bedrock					
TW06-1	Fractured Limestone Bedrock	-1.58	0.01	0.03	0.00	-0.00
TW06-2	Brown Sand, Fractured Limestone Bedrock					
TW07-1	<i>Fractured Limestone Bedrock</i>	-4.99	-0.10	-0.02	-0.04	-0.09
TW07-2	Grey Sand, Fractured Limestone Bedrock					
TW08-1	Fractured Limestone Bedrock	-6.23	0.43	0.40	0.35	0.41
TW08-2	Limestone Bedrock					
TW09-1	Limestone Bedrock	-5.92	-0.15	-0.09	-0.10	-0.15
TW09-2	Till					



Table 4: Groundwater Quality - Overburden/Upper Bedrock

	Unit	RDL	ODWQS	RUC	TW02_2 2016-10-26	TW02_2 2018-06-11	TW02_2 2018-11-05	TW02_2 2019-05-29	TW02_2 2019-10-28	TW02_2 2020-05-27	TW02_2 2020-11-12	TW02_2 2021-06-28	TW02_2 2021-11-10
Metals													
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		3.9	<0.2	0.7	<0.2	0.8	<0.2	1.7	0.2	0.1
Barium (Filtered)	µg/L	0.01	1000	273	264	31.7	145	28.7	125	25.5	116	56	37
Boron (Filtered)	µg/L	0.2	5000	2507	591	13	415	160	236	13	389	33	25
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			371,000	130,000	428,000	107,000	358,000	76,400	334,000	-	-
Cadmium (Filtered)	µg/L	0.003	5		0.009	0.004	0.016	0.003	0.019	<0.003	0.012	<0.015	<0.015
Chloride	µg/L	200	250000	126000	42,000	2000	18,000	2000	20,000	1000	16,000	4800	2200
Chromium (III+VI) (Filtered)	µg/L	0.03	50		1.29	0.04	0.39	0.13	0.34	<0.08	0.1	<1	2
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.09	0.57	0.83	0.7	0.8	0.6	0.9	1.9	0.4
Iron (Filtered)	µg/L	2	300	154	33,400	<7	3460	106	68	<7	3360	1740	400
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		<0.01	0.02	0.09	0.01	0.03	<0.01	0.02	0.08	<0.02
Manganese (Filtered)	µg/L	0.01	50	25.52	3440	6.8	2800	8000	2410	0.16	2140	-	-
Magnesium (Filtered)	µg/L	1			31,600	2720	16,400	3190	14,800	1900	16,100	-	-
Mercury (Filtered)	µg/L	0.01	1		<0.01	0.04	<10	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3			<30	<30	<30	<30	30	<30	<30	140	10
Potassium (Filtered)	µg/L	2			3750	504	1010	780	1010	488	1480	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101070	51,000	2060	20,900	2340	15,800	1580	18,900	-	-
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		5	<2	3	2	4	<2	3	<5	<5
Inorganics													
Alkalinity (as CaCO3)	mg/L	2	500	373	641	278	628	398	569	238	594	416	312
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	450	332
Solids - Total Dissolved (TDS)	mg/L	3	500	389	1630	326	1191	251	1140	226	1040	453	302
Oxygen Demand - Chemical (COD)	mg/L	5			73	9	16	<8	25	<8	48	25	12
Solids - Total Suspended (TSS)	mg/L	2			133	<2	7	32	3	25	17	109	11
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1	5		-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2			7	<4	<4	<4	<4	<4	8	<3	<3
Phenols (4AAP)	mg/L	0.001			0.004	<0.001	0.003	0.001	0.003	<0.001	<0.001	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	410	7	310	6	320	5	220	36	6
Ammonia	mg/L	0.01			1.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.03	0.02
Nitrate (as N)	mg/L	0.05	10	3.31	0.09	0.23	<0.06	0.36	<0.06	0.69	<0.06	0.12	0.81
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.3
Conductivity (lab)	µS/cm	1			1940	526	1520	882	1480	447	1380	857	582
pH (Lab)	-	0.05	6.5-8.5		6.81	7.93	7.06	7.47	7.53	7.91	7.23	7.65	8.07
Field													
DO (Field)	mg/L				-	-	-	5.4	5.3	6.6	6.3	9.69	6.25
Redox Potential (Field)	mV				-	-	-	76	139	155	15	110	64
Temp (Field)	°C				-	-	-	9.1	12	11.5	12	13.9	12.2
Conductivity (field)	µS/cm				-	-	-	365	1103	390	935	472	264
pH (Field)	-		6.5-8.5		-	-	-	7.85	6.87	8.24	7.2	7.33	6.94



Table 4: Groundwater Quality - Overburden/Upper Bedrock

	Unit	RDL	ODWQS	RUC	TW05 2 2016-10-26	TW05 2 2018-06-11	TW05 2 2018-11-05	TW05 2 2019-05-29	TW05 2 2019-10-28	TW05 2 2020-05-27	TW05 2 2020-11-12	TW05 2 2021-06-28	TW05 2 2021-11-10
Metals													
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		0.5	0.4	0.5	0.3	0.5	0.2	0.8	0.3	0.4
Barium (Filtered)	µg/L	0.01	1000	273	32.8	32.2	31.6	25.4	24.9	24.6	33.5	28	27
Boron (Filtered)	µg/L	0.2	5000	2507	3380	9120	10,000	49,600	10,200	6110	8950	10,200	9400
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			840,000	621,000	760,000	351,000	561,000	353,000	618,000	-	-
Cadmium (Filtered)	µg/L	0.003	5		0.011	0.008	0.013	0.006	0.014	0.007	0.009	<0.029	<0.029
Chloride	µg/L	200	250000	126000	230,000	61,000	180,000	140,000	210,000	140,000	250,000	120,000	149,000
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.49	0.22	0.41	0.31	0.33	0.3	0.21	<1	<1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		7.83	8.3	11.5	5.1	22.6	5	10.5	9.7	8.5
Iron (Filtered)	µg/L	2	300	154	30	15	24	440	11	<7	21	206	52
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.13	0.03	0.07	0.15	0.63	0.03	0.09	0.23	<0.09
Manganese (Filtered)	µg/L	0.01	50	25.52	1190	67.7	199	44.2	52.9	16	22.8	-	-
Magnesium (Filtered)	µg/L	1			102,000	119,000	204,000	113,000	210,000	122,000	230,000	-	-
Mercury (Filtered)	µg/L	0.01	1		<0.01	0.03	<10	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3			<30	60	<30	30	100	<30	40	50	40
Potassium (Filtered)	µg/L	2			7130	1950	3940	1550	2610	1470	2600	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101070	170,000	151,000	242,000	108,000	206,000	120,000	213,000	-	-
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		5	<2	3	4	11	2	3	<10	<5
Inorganics													
Alkalinity (as CaCO3)	mg/L	2	500	373	539	336	507	322	493	352	429	379	516
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	2270	2160
Solids - Total Dissolved (TDS)	mg/L	3	500	389	4040	3010	4489	1900	3690	3100	4070	2020	2110
Oxygen Demand - Chemical (COD)	mg/L	5			69	29	57	16	45	25	47	29	35
Solids - Total Suspended (TSS)	mg/L	2			<2	2	5	86	4	246	83	46	37
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1	5		-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2			<4	<4	<4	<4	<4	<4	5	<3	<3
Phenols (4AAP)	mg/L	0.001			0.003	0.001	0.006	0.003	0.008	0.004	<0.001	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	2100	1100	2400	880	2200	1600	2300	1680	1910
Ammonia	mg/L	0.01			0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.02	0.04
Nitrate (as N)	mg/L	0.05	10	3.31	3.84	5.72	11.3	2.62	5.89	5.76	7.25	7.2	6.04
Nitrite (as N)	mg/L	0.03	1		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.5	0.24
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			1.1	0.7	2.3	<0.5	0.7	0.9	1.4	1	1.2
Conductivity (lab)	µS/cm	1			3990	3040	4140	2070	3810	2880	4180	3610	3750
pH (Lab)	-	0.05	6.5-8.5		7.16	7.67	7.52	7.33	7.76	7.79	7.53	7.65	7.83
Field													
DO (Field)	mg/L				-	-	-	7.5	7.2	6.6	8.2	8.28	6.61
Redox Potential (Field)	mV				-	-	-	118	165	224	101	88	60
Temp (Field)	°C				-	-	-	9.3	11.3	12.9	11.3	12.4	10.1
Conductivity (field)	µS/cm				-	-	-	1708	1058	2658	2827	2946	1393
pH (Field)	-		6.5-8.5		-	-	-	7.31	6.55	7.37	7.36	7.2	6.9



Table 4: Groundwater Quality - Overburden/Upper Bedrock

	Unit	RDL	ODWQS	RUC	TW06 2 2016-10-26	TW06 2 2018-06-11	TW06 2 2018-11-05	TW06 2 2019-05-29	TW06 2 2019-10-28	TW06 2 2023-05-27	TW06 2 2020-11-12	TW06 2 2021-06-28	TW06 2 2021-11-10
Metals													
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		<0.2	0.2	<0.2	<0.2	<0.2	<0.2	0.4	0.2	0.2
Barium (Filtered)	µg/L	0.01	1000	273	360	152	354	114	287	157	241	237	128
Boron (Filtered)	µg/L	0.2	5000	2507	267	256	175	80	359	217	361	193	218
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			256,000	205,000	324,000	112,000	252,000	140,000	218,000	-	-
Cadmium (Filtered)	µg/L	0.003	5		0.021	0.007	0.012	0.007	0.012	0.004	0.014	0.017	<0.015
Chloride	µg/L	200	250000	126000	58,000	35,000	180,000	5000	110,000	24,000	53,000	36,400	24,400
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.37	0.1	0.23	0.12	0.14	0.11	<0.08	<1	<1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		1.69	1.35	2.08	0.9	1.9	1.2	2.4	2.6	2.5
Iron (Filtered)	µg/L	2	300	154	17	<7	39	11	10	<7	18	17	11
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		<0.01	0.03	0.09	0.01	0.03	<0.01	0.03	0.06	<0.02
Manganese (Filtered)	µg/L	0.01	50	25.52	1970	34.9	1390	463	1320	74.7	781	-	-
Magnesium (Filtered)	µg/L	1			16,200	12,700	17,500	5330	15,100	12,000	12,600	-	-
Mercury (Filtered)	µg/L	0.01	1		<0.01	0.03	<10	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3			<30	50	<30	<30	30	40	<30	30	40
Potassium (Filtered)	µg/L	2			6840	11,400	5260	2320	4390	9650	5990	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101070	47,700	27,500	39,900	7510	36,600	20,600	37,800	-	-
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		2	<2	3	<2	2	2	<2	<5	<5
Inorganics													
Alkalinity (as CaCO3)	mg/L	2	500	373	438	392	434	276	415	361	446	419	343
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	582	388
Solids - Total Dissolved (TDS)	mg/L	3	500	389	1010	577	1091	489	909	454	757	577	411
Oxygen Demand - Chemical (COD)	mg/L	5			10	19	14	<8	11	16	14	9	29
Solids - Total Suspended (TSS)	mg/L	2			<2	<2	14	7	3	15	20	24	56
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1	5		-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2			<4	<4	5	<4	<4	<4	<4	3	3
Phenols (4AAP)	mg/L	0.001			0.002	0.001	0.005	<0.001	0.004	0.001	<0.001	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	310	70	220	23	140	49	98	106	50
Ammonia	mg/L	0.01			1.2	1.2	1.1	0.4	0.7	1.3	1.6	0.16	0.1
Nitrate (as N)	mg/L	0.05	10	3.31	0.13	1.09	0.06	1.98	0.15	0.17	0.08	1.94	1.01
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.07	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			1.6	1.5	1.1	0.6	0.8	1.6	1.8	0.6	0.5
Conductivity (lab)	µS/cm	1			1390	919	1550	572	1350	783	1110	1080	783
pH (Lab)	-	0.05	6.5-8.5		7.24	7.92	7.41	8.04	7.77	7.97	7.74	7.72	7.88
Field													
DO (Field)	mg/L				-	-	-	4.2	7	6.3	8.3	2.82	3.84
Redox Potential (Field)	mV				-	-	-	118	167	124	55	53	29
Temp (Field)	°C				-	-	-	8.6	11.3	12.5	11.3	12.1	9.5
Conductivity (field)	µS/cm				-	-	-	517	1006	626	731	1012	341
pH (Field)	-		6.5-8.5		-	-	-	7.71	7.01	7.27	7.4	7.16	7.12



Table 4: Groundwater Quality - Overburden/Upper Bedrock

	Unit	RDL	ODWQS	RUC	TW07_2 2016-10-26	TW07_2 2018-06-11	TW07_2 2018-11-05	TW07_2 2019-05-29	TW07_2 2019-10-28	TW07_2 2020-05-27	TW07_2 2020-11-12	TW07_2 2021-06-28	TW07_2 2021-11-10
Metals													
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		2.2	1.4	1.7	1.2	0.7	0.3	1	<3	1.7
Barium (Filtered)	µg/L	0.01	1000	273	143	132	128	128	96.5	55.3	96.2	105	100
Boron (Filtered)	µg/L	0.2	5000	2507	605	1100	939	1250	1490	1250	1390	1500	1560
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			246,000	384,000	341,000	339,000	263,000	257,000	244,000	-	-
Cadmium (Filtered)	µg/L	0.003	5		<0.003	0.004	<0.003	0.004	0.005	<0.003	0.003	<0.3	<0.015
Chloride	µg/L	200	250000	126000	130,000	170,000	150,000	280,000	130,000	130,000	140,000	176,000	138,000
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.53	0.23	0.13	0.14	0.15	<0.08	0.14	<3	<1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.51	0.36	0.82	1.2	0.3	1.2	0.7	<2	0.1
Iron (Filtered)	µg/L	2	300	154	7250	9540	7630	8410	267	93	1520	6410	5580
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.05	0.02	<0.01	0.01	0.03	<0.01	0.06	<0.9	<0.04
Manganese (Filtered)	µg/L	0.01	50	25.52	1950	2810	2550	2470	2250	754	1660	-	-
Magnesium (Filtered)	µg/L	1			27,400	36,200	32,600	41,000	30,500	30,500	26,800	-	-
Mercury (Filtered)	µg/L	0.01	1		<0.01	0.09	<10	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3			<30	50	<30	220	40	250	150	170	30
Potassium (Filtered)	µg/L	2			2450	2730	3000	2460	2480	2430	2800	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101070	87,100	92,700	94,500	127,000	123,000	108,000	114,000	-	-
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		6	2	3	4	5	<2	3	<5	<5
Inorganics													
Alkalinity (as CaCO3)	mg/L	2	500	373	337	335	323	382	345	341	348	307	357
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	760	681
Solids - Total Dissolved (TDS)	mg/L	3	500	389	1070	1620	1351	1590	1320	1230	1200	939	888
Oxygen Demand - Chemical (COD)	mg/L	5			17	17	15	11	13	20	14	14	32
Solids - Total Suspended (TSS)	mg/L	2			19	23	16	224	19	254	200	134	44
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1	5		-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2			<4	<4	<4	<4	<4	<4	<4	<3	<3
Phenols (4AAP)	mg/L	0.001			0.001	0.003	0.004	0.007	0.002	0.005	<0.001	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	400	560	490	520	460	470	410	362	360
Ammonia	mg/L	0.01			0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.14	0.16
Nitrate (as N)	mg/L	0.05	10	3.31	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.06	<0.05
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.5	0.4
Conductivity (lab)	µS/cm	1			1460	1920	1740	2140	1730	1560	1610	17,100	1620
pH (Lab)	-	0.05	6.5-8.5		7.39	7.65	7.42	7.07	7.78	7.53	7.61	7.59	7.87
Field													
DO (Field)	mg/L				-	-	-	6.6	5.2	8.9	4.7	2.51	3.19
Redox Potential (Field)	mV				-	-	-	-15	162	211	-15	22	56
Temp (Field)	°C				-	-	-	8.5	11.9	13.4	11.9	11.9	11
Conductivity (field)	µS/cm				-	-	-	1694	1751	1438	1065	1575	669
pH (Field)	-		6.5-8.5		-	-	-	7.03	6.35	7.17	7.57	7.02	6.92



Table 4: Groundwater Quality - Overburden/Upper Bedrock

	Unit	RDL	ODWQS	RUC	TW08 2 2014-12-23	TW08 2 2015-05-19	TW08 2 2015-11-03	TW08 2 2016-05-19	TW08 2 2019-05-29	TW08 2 2020-05-27	TW08 2 2020-11-12	TW08 2 2021-11-10
Metals												
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		<0.2	<0.2	0.5	<0.2	<0.2	<0.2	0.3	<0.1
Barium (Filtered)	µg/L	0.01	1000	273	30.3	25.4	113	30.4	29.3	21.9	43.6	31
Boron (Filtered)	µg/L	0.2	5000	2507	8.5	30.7	21.9	11	13	6	93	10
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			98,500	99,800	168,000	93,800	98,300	85,300	128,000	-
Cadmium (Filtered)	µg/L	0.003	5		<0.003	<0.003	0.005	<0.003	<0.003	<0.003	<0.003	<0.015
Chloride	µg/L	200	250000	126000	1100	2000	5000	2000	2000	2000	3000	2800
Chromium (III+VI) (Filtered)	µg/L	0.03	50		<0.03	0.08	<0.03	0.36	0.2	0.19	<0.08	<1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.84	0.3	0.74	1.07	0.7	0.5	1.3	0.4
Iron (Filtered)	µg/L	2	300	154	2	4	33	16	20	<7	<7	<5
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.01	<0.01	0.09	0.01	0.02	<0.01	0.02	<0.02
Manganese (Filtered)	µg/L	0.01	50	25.52	2.9	1.16	70.5	0.24	0.91	0.13	1.67	-
Magnesium (Filtered)	µg/L	1			2950	2760	6720	2490	2820	2050	3050	-
Mercury (Filtered)	µg/L	0.01	1		0.04	<0.01	<0.01	<0.01	<10	<10	<10	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3			360	<30	<30	6	<30	220	770	820
Potassium (Filtered)	µg/L	2			584	463	2510	657	444	400	1180	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101070	1870	1890	4020	1800	2860	1610	2390	-
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		6	3	11	6	3	2	4	<5
Inorganics												
Alkalinity (as CaCO3)	mg/L	2	500	373	258	246	446	207	229	236	1080	252
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	272
Solids - Total Dissolved (TDS)	mg/L	3	500	389	300	303	491	277	234	234	397	252
Oxygen Demand - Chemical (COD)	mg/L	5			<8	<8	<8	<8	<8	<8	9	5
Solids - Total Suspended (TSS)	mg/L	2			-	-	<2	<2	35	-	1350	3650
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1	5		<1	<1	<1	-	-	1	-	-
Oxygen Demand - Biological (BOD)	mg/L	2			-	-	<4	<4	<4	-	<4	<3
Phenols (4AAP)	mg/L	0.001			<0.002	<0.002	0.003	<0.001	<0.001	<0.002	<0.001	<0.002
Sulphate	mg/L	0.2	500	253	5	5	23	5	8	4	7	4
Ammonia	mg/L	0.01			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.01
Nitrate (as N)	mg/L	0.05	10	3.31	1.58	1.22	0.17	0.67	0.61	1.08	1.18	1.94
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	0.07	<0.03	<0.03	<0.03	<0.03	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.4
Conductivity (lab)	µS/cm	1			465	469	856	448	422	424	523	487
pH (Lab)	-	0.05	6.5-8.5		8.05	8.05	7.93	8.17	8.18	8	7.69	8.05
Field												
DO (Field)	mg/L				-	-	-	-	5.7	8.3	9.9	9.69
Redox Potential (Field)	mV				-	-	-	-	-	45	83	56
Temp (Field)	°C				-	-	-	-	10.1	12.6	-	12.1
Conductivity (field)	µS/cm				-	-	-	-	404	365	413	219
pH (Field)	-		6.5-8.5		-	-	-	-	7.56	7.5	8.04	7.27



Table 4: Groundwater Quality - Overburden/Upper Bedrock

	Unit	RDL	ODWQS	RUC	TW09_2 2016-10-26	TW09_2 2018-06-11	TW09_2 2018-11-05	TW09_2 2019-05-29	TW09_2 2019-10-28	TW09_2 2020-05-27	TW09_2 2020-11-12	TW09_2 2021-06-28	TW09_2 2021-11-10
Metals													
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		0.2	<0.2	<0.2	0.4	<0.2	<0.2	0.2	<0.1	0.2
Barium (Filtered)	µg/L	0.01	1000	273	263	237	280	487	210	205	205	276	259
Boron (Filtered)	µg/L	0.2	5000	2507	16	25	10	26	11	8	58	14	12
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			90,700	106,000	117,000	281,000	86,800	88,300	108,000	-	-
Cadmium (Filtered)	µg/L	0.003	5		<0.003	0.011	<0.003	0.064	<0.003	0.005	<0.003	<0.015	<0.015
Chloride	µg/L	200	250000	126000	5000	4000	4000	4000	4000	4000	5000	4500	6200
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.07	0.06	0.12	4.01	0.09	0.1	<0.08	2	1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.41	0.33	0.26	8.1	0.7	0.9	0.5	0.2	1.9
Iron (Filtered)	µg/L	2	300	154	36	123	67	2820	17	<7	23	218	<5
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.01	0.04	<0.01	2.49	0.04	0.02	0.01	0.08	0.47
Manganese (Filtered)	µg/L	0.01	50	25.52	12.04	19.4	27.6	273	7.26	0.32	25.8	-	-
Magnesium (Filtered)	µg/L	1			3610	3120	3510	8300	2870	2990	3670	-	-
Mercury (Filtered)	µg/L	0.01	1		<0.01	0.07	<10	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3			<30	<30	<30	730	<30	300	290	680	640
Potassium (Filtered)	µg/L	2			908	674	858	1100	723	757	941	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101070	3200	3230	3100	3000	3090	3010	3380	-	-
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		<2	3	<2	17	9	4	<2	<5	<5
Inorganics													
Alkalinity (as CaCO3)	mg/L	2	500	373	225	235	241	340	215	237	531	228	256
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	282	260
Solids - Total Dissolved (TDS)	mg/L	3	500	389	269	266	334	274	291	243	303	255	265
Oxygen Demand - Chemical (COD)	mg/L	5			10	<8	<8	<8	<8	14	13	69	71
Solids - Total Suspended (TSS)	mg/L	2			3	<2	3	2210	<2	3200	341	2000	1070
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1	5		-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2			<4	<4	<4	4	<4	4	<4	4	4
Phenols (4AAP)	mg/L	0.001			0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	14	13	10	15	10	15	24	16	16
Ammonia	mg/L	0.01			0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.22	0.26
Nitrate (as N)	mg/L	0.05	10	3.31	0.28	<0.06	<0.06	0.2	0.09	0.07	0.21	0.38	0.16
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	1.7
Conductivity (lab)	µS/cm	1			456	473	475	448	384	472	478	493	512
pH (Lab)	-	0.05	6.5-8.5		7.91	7.99	7.91	7.96	8.26	8.02	7.86	7.83	8
Field													
DO (Field)	mg/L				-	-	-	4.1	6.7	6	5.9	9.85	8.19
Redox Potential (Field)	mV				-	-	-	115	167	214	220	56	11
Temp (Field)	°C				-	-	-	10.8	11.9	13.8	11.9	14.8	9.1
Conductivity (field)	µS/cm				-	-	-	362	339	388	302	463	235
pH (Field)	-		6.5-8.5		-	-	-	7.82	6.59	7.79	8.55	7.61	7.54



Table 4: Groundwater Quality - Overburden/Upper Bedrock

	Unit	RDL	ODWQS	RUC	TW10 2 2014-12-23	TW10 2 2015-05-19	TW10 2 2015-11-03	TW10 2 2016-05-19	TW10 2 2018-06-11	TW10 2 2019-05-29	TW10 2 2020-05-27	TW10 2 2020-11-12	TW10 2 2021-06-28	TW10 2 2021-11-10
Metals														
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		2.5	1.5	0.9	0.6	1.8	1.6	0.3	0.4	0.9	1.1
Barium (Filtered)	µg/L	0.01	1000	273	487	438	447	355	410	398	193	279	344	301
Boron (Filtered)	µg/L	0.2	5000	2507	307	293	332	358	386	431	328	393	387	532
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			284,000	278,000	246,000	252,000	186,000	197,000	179,000	241,000	-	-
Cadmium (Filtered)	µg/L	0.003	5		0.008	0.006	0.036	0.038	0.004	0.01	0.009	0.038	0.031	<0.015
Chloride	µg/L	200	250000	126000	41,000	37,000	30,000	97,000	21,000	28,000	19,000	18,000	21,000	27,100
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.54	0.47	0.21	1.11	0.79	0.92	0.3	0.16	1	<1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.37	0.46	2	1.63	3.55	2	0.5	2.8	0.3	0.4
Iron (Filtered)	µg/L	2	300	154	70,100	44,400	2110	19,400	53,800	41,300	1380	840	30,500	20,300
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.02	0.02	0.05	0.07	0.05	1.29	0.02	0.01	0.07	0.11
Manganese (Filtered)	µg/L	0.01	50	25.52	3440	4390	2180	2000	1840	2490	2960	1250	-	-
Magnesium (Filtered)	µg/L	1			19,500	18,000	17,500	17,500	12,000	15,800	13,000	13,400	-	-
Mercury (Filtered)	µg/L	0.01	1		0.14	-	0.01	<0.01	0.01	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3			<30	<30	<30	20	<30	130	110	190	810	290
Potassium (Filtered)	µg/L	2			20,500	16,300	21,900	28,700	19,800	19,700	16,700	19,000	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101070	29,100	31,900	32,200	74,200	24,000	28,200	22,200	24,200	-	-
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-	<0.05
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		18	14	12	4	3	19	7	5	6	<5
Inorganics														
Alkalinity (as CaCO3)	mg/L	2	500	373	722	730	606	688	577	628	575	637	563	652
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	-	525	655
Solids - Total Dissolved (TDS)	mg/L	3	500	389	1030	903	929	954	560	806	563	694	620	683
Oxygen Demand - Chemical (COD)	mg/L	5			46	38	25	62	32	35	31	44	85	57
Solids - Total Suspended (TSS)	mg/L	2			-	100	7	44	103	355	508	-	1280	6400
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1	5		14.3	-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2			-	<4	<4	<4	<4	<4	6	11	12	14
Phenols (4AAP)	mg/L	0.001			0.003	0.005	0.001	<0.001	0.003	0.004	0.005	0.001	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	160	100	160	82	4	8	13	83	7	32
Ammonia	mg/L	0.01			30.4	15.4	18	31.2	24.1	27.6	21.8	16.2	20.9	8.02
Nitrate (as N)	mg/L	0.05	10	3.31	<0.06	<0.06	9.64	0.16	<0.06	<0.06	<0.06	3.41	0.52	<0.05
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	0.25	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			31.6	16.3	19	32.4	27.3	26.7	21.6	19.9	26	9.8
Conductivity (lab)	µS/cm	1			1520	1410	1530	1720	1080	1170	989	1190	1150	1260
pH (Lab)	-	0.05	6.5-8.5		7.45	7	7.3	7.65	7.39	7.49	7.02	7.55	7.34	7.52
Field														
DO (Field)	mg/L				-	-	-	-	-	6.6	4.7	8.8	6.05	5.27
Redox Potential (Field)	mV				-	-	-	-	-	25	-33	-9	-33	50
Temp (Field)	°C				-	-	-	-	-	10	13	-	14	10.8
Conductivity (field)	µS/cm				-	-	-	-	-	1000	913	799	1175	550
pH (Field)	-		6.5-8.5		-	-	-	-	-	6.7	7	10.6	6.7	6.69



Table 4: Groundwater Quality - Overburden/Upper Bedrock

	Unit	RDL	ODWQS	RUC	TW11_2 2014-12-23	TW11_2 2015-05-19	TW11_2 2015-11-03	TW11_2 2016-05-19	TW11_2 2016-10-26	TW11_2 2018-06-11	TW11_2 2018-11-05	TW11_2 2019-05-29	TW11_2 2019-10-28	TW11_2 2020-05-27	TW11_2 2020-11-12	TW11_2 2021-06-28	TW11_2 2021-11-10
Metals																	
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		<0.2	<0.2	0.9	2.1	1.8	0.9	0.4	<0.2	0.5	<0.2	0.6	1	0.2
Barium (Filtered)	µg/L	0.01	1000	273	22.2	19.1	195	372	616	539	308	28.3	404	78.4	272	574	96
Boron (Filtered)	µg/L	0.2	5000	2507	13.2	5.9	38.7	327	290	491	61	47	371	35	336	616	62
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			110,000	106,000	106,000	188,000	215,000	276,000	239,000	118,000	212,000	100,000	176,000	-	-
Cadmium (Filtered)	µg/L	0.003	5		0.005	0.004	0.007	0.009	0.013	0.023	0.006	0.003	0.011	<0.003	0.005	<0.029	<0.015
Chloride	µg/L	200	250000	126000	4400	3000	17,000	23,000	72,000	74,000	32,000	3000	56,000	2000	62,000	106,000	18,200
Chromium (III+VI) (Filtered)	µg/L	0.03	50		<0.03	0.05	<0.03	0.93	0.73	1.05	0.22	0.16	0.41	<0.08	0.22	43	<1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.72	0.29	0.85	1.01	0.11	1.21	1.74	1	0.8	0.8	0.8	0.7	0.5
Iron (Filtered)	µg/L	2	300	154	76	<2	3570	50,000	26,800	34,700	296	67	8110	<7	5230	34,400	1130
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		<0.01	0.02	0.08	0.08	0.1	0.13	0.04	0.03	0.04	0.02	0.17	0.07	0.07
Manganese (Filtered)	µg/L	0.01	50	25.52	8.13	5.05	325	2580	2770	1690	290	1.69	1520	1.43	652	-	-
Magnesium (Filtered)	µg/L	1			1910	1920	5060	12,300	18,300	26,000	7760	1870	24,500	1980	19,100	-	-
Mercury (Filtered)	µg/L	0.01	1		0.16	-	0.02	<0.01	0.01	<0.01	<10	<10	<10	<10	<0.02	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3			40	<30	<30	24	<30	40	<30	360	<30	270	140	1430	170
Potassium (Filtered)	µg/L	2			887	912	5480	20,300	28,900	38,500	7960	814	29,200	1200	20,500	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101070	2460	2530	6660	25,900	52,200	82,100	15,300	2610	49,900	3100	39,000	-	-
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		4	<2	5	9	7	5	5	4	4	<2	<2	<5	<5
Inorganics																	
Alkalinity (as CaCO3)	mg/L	2	500	373	274	261	289	559	668	730	400	303	646	222	543	776	295
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	-	-	-	-	772	350
Solids - Total Dissolved (TDS)	mg/L	3	500	389	343	306	351	606	937	1030	663	311	891	246	746	1070	358
Oxygen Demand - Chemical (COD)	mg/L	5			<8	<8	14	42	41	48	15	<8	51	<8	39	128	23
Solids - Total Suspended (TSS)	mg/L	2			-	<2	8	115	45	55	2	437	108	854	-	2550	540
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1	5		<1	-	-	-	-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2			-	<4	<4	<4	6	15	<4	<4	<4	6	12	17	6
Phenols (4AAP)	mg/L	0.001			0.003	0.001	<0.001	0.001	0.001	0.004	0.002	0.002	0.004	0.002	<0.001	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	5.3	5	13	15	150	120	130	9	170	5	69	102	10
Ammonia	mg/L	0.01			<0.1	<0.1	3.5	30.4	29.5	18.1	5.3	<0.1	33.4	<0.1	21.7	44.5	1.76
Nitrate (as N)	mg/L	0.05	10	3.31	3.23	1.54	3.8	0.08	<0.06	<0.06	0.17	2.14	<0.06	2.38	1.06	0.12	9.39
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.04	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			<0.5	<0.5	4.1	30.2	29.3	21.6	5.6	0.6	31.8	<0.5	23.6	47.1	2.2
Conductivity (lab)	µS/cm	1			511	486	659	1170	1580	1730	1010	516	1560	439	1280	1940	689
pH (Lab)	-	0.05	6.5-8.5		8.17	7.73	7.5	7.76	7.02	7.37	7.46	7.5	7.06	7.8	7.42	7.06	7.77
Field																	
DO (Field)	mg/L				-	-	-	-	-	-	-	8.1	5.8	8	5	4.05	5.48
Redox Potential (Field)	mV				-	-	-	-	-	-	-	193	-6	125	-35	-25	27
Temp (Field)	°C				-	-	-	-	-	-	-	7.7	10.9	11.5	10.9	17.6	10.1
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	396	1266	361	890	1844	294
pH (Field)	-		6.5-8.5		-	-	-	-	-	-	-	7.7	6.64	7.58	7.24	6.64	7.12



Table 5: Groundwater Quality - Lower Bedrock

	Unit	RDL	ODWQS	RUC	TW02-1 2017-06-07	TW02-1 2017-09-29	TW02-1 2018-06-11	TW02-1 2018-11-05	TW02-1 2019-05-29	TW02-1 2019-10-28	TW02-1 2020-05-27	TW02-1 2020-11-12	TW02-1 2021-06-28	TW02-1 2021-11-10
Metals														
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		<0.2	<0.2	<0.2	<0.2	<0.2	23	<0.2	<0.2	-	-
Barium (Filtered)	µg/L	0.01	1000	282	18.6	25.1	20.1	23.6	19.2	8	15.8	28.3	21	24
Boron (Filtered)	µg/L	0.2	5000	2506	11	20	6	12	7	112,000	36	23	7	9
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			91,100	115,000	103,000	113,000	102,000	<0.003	82,900	105,000	103,000	111,000
Cadmium (Filtered)	µg/L	0.003	5		<0.003	0.003	0.011	0.003	0.004	0.24	<0.003	<0.003	-	-
Chloride	µg/L	200	250000	126800	2000	4000	2000	12,000	3000	8000	2000	7000	5200	2900
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.55	0.51	0.16	0.13	0.16	0.6	0.28	0.21	-	-
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.52	0.66	0.38	0.59	0.7	129	0.6	0.8	-	-
Iron (Filtered)	µg/L	2	300	160	<7	11	<7	<7	7	771	<7	17	8	5
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.03	0.04	0.02	0.03	0.01	0.04	0.02	0.05	-	-
Manganese (Filtered)	µg/L	0.01	50	30.28	0.08	0.16	1.88	0.4	0.11	4620	0.02	0.26	-	-
Magnesium (Filtered)	µg/L	1			1970	2370	2000	2000	2060	0.54	1850	1760	2210	1980
Mercury (Filtered)	µg/L	0.01	1		-	-	-	-	<10	<0.2	-	-	-	-
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	9			-	-	-	-	-	-	<30	-	-	-
Potassium (Filtered)	µg/L	2			722	755	658	731	671	2100	628	851	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101327	2210	3000	2450	6620	2190	<3	2020	4600	2300	2700
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		<2	2	<2	2	2	3	2	-	-	-
Inorganics														
Alkalinity (as CaCO3)	mg/L	2	500	381	209	258	226	241	228	252	218	258	227	265
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	-	267	286
Solids - Total Dissolved (TDS)	mg/L	3	500	390	237	274	240	320	260	334	254	300	250	270
Oxygen Demand - Chemical (COD)	mg/L	5			<8	<8	<8	<8	<8	<8	<8	<8	11	9
Solids - Total Suspended (TSS)	mg/L	2			-	-	-	-	-	-	-	-	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	5		2	1	2	1	1	<1	1	2	2.8	1.8
Oxygen Demand - Biological (BOD)	mg/L	2			-	-	-	-	-	-	-	-	-	-
Phenols (4AAP)	mg/L	0.002			-	-	-	-	-	-	-	-	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	3	5	3	8	3	7	3	8	6	5
Ammonia	mg/L	0.01			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.01	<0.01
Nitrate (as N)	mg/L	0.05	10	3.38	0.41	2.61	0.19	3.67	0.96	3.71	0.57	2.68	1.47	1.52
Nitrite (as N)	mg/L	0.03	1		-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			-	-	-	-	-	-	-	-	-	-
Conductivity (lab)	µS/cm	1			415	505	423	542	451	581	429	499	484	521
pH (Lab)	-	0.05	6.5-8.5		7.74	7.9	7.91	7.81	8.12	8.02	7.95	7.72	7.82	7.79
Field														
DO (Field)	mg/L				-	-	-	-	7.6	8.1	7.8	10.2	8.44	10.08
Redox Potential (Field)	mV				-	-	-	-	75	117	43	125	113	63
Temp (Field)	°C				-	-	-	-	9.5	11.3	12.8	11.3	15.9	11
Conductivity (field)	µS/cm				-	-	-	-	343	502	419	332	681	225
pH (Field)	-		6.5-8.5		-	-	-	-	7.6	7.35	7.46	7.82	7.14	7.16



Table 5: Groundwater Quality - Lower Bedrock

	Unit	RDL	ODWQS	RUC	TW03-1						
					2016-05-19	2017-06-07	2018-06-11	2019-05-29	2020-05-27	2021-06-28	2021-11-10
Metals											
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		2.2	1.8	1.1	13	0.5	-	-
Barium (Filtered)	µg/L	0.01	1000	282	152	299	161	639	142	223	359
Boron (Filtered)	µg/L	0.2	5000	2506	181	204	164	266	171	222	298
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			108,000	110,000	135,000	135,000	114,000	122,000	194,000
Cadmium (Filtered)	µg/L	0.003	5		0.017	0.004	<0.003	0.009	<0.003	-	-
Chloride	µg/L	200	250000	126800	13,000	16,000	11,000	19,000	14,000	14,700	22,000
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.8	1.18	0.37	3.71	0.41	-	-
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.42	0.33	0.16	0.9	0.5	-	-
Iron (Filtered)	µg/L	2	300	160	17,100	36,400	15,200	140,000	923	9450	112,000
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.08	0.04	<0.01	0.49	0.05	-	-
Manganese (Filtered)	µg/L	0.01	50	30.28	429	323	503	646	525	-	-
Magnesium (Filtered)	µg/L	1			8330	8500	8620	10,000	10,300	10,500	16,200
Mercury (Filtered)	µg/L	0.01	1		<0.01	-	-	10	-	-	-
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	9			-	-	-	660	-	-	-
Potassium (Filtered)	µg/L	2			14,300	15,500	14,200	13,900	13,900	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101327	14,000	15,700	11,900	18,600	15,700	17,700	21,200
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		6	4	<2	6	2	-	-
Inorganics											
Alkalinity (as CaCO3)	mg/L	2	500	381	415	382	394	483	395	435	564
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	348	552
Solids - Total Dissolved (TDS)	mg/L	3	500	390	360	380	394	389	366	508	640
Oxygen Demand - Chemical (COD)	mg/L	5			19	26	25	78	104	2640	327
Solids - Total Suspended (TSS)	mg/L	2			-	-	-	-	-	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	5		4.6	7	5	6	7	17.8	21
Oxygen Demand - Biological (BOD)	mg/L	2			-	-	-	-	-	-	-
Phenols (4AAP)	mg/L	0.002			-	-	-	-	-	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	6	20	5	9	4	26	58
Ammonia	mg/L	0.01			19.2	19.7	16	21.3	18.3	21.3	21
Nitrate (as N)	mg/L	0.05	10	3.38	0.06	<0.06	<0.06	<0.06	0.06	0.15	<0.05
Nitrite (as N)	mg/L	0.03	1		-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			-	-	-	-	-	-	-
Conductivity (lab)	µS/cm	1			787	801	758	822	771	954	1190
pH (Lab)	-	0.05	6.5-8.5		7.69	7.2	7.49	7.11	7.5	7.39	7.41
Field											
DO (Field)	mg/L				-	-	-	5	5.2	0.04	0.82
Redox Potential (Field)	mV				-	-	-	60	138	75	106
Temp (Field)	°C				-	-	-	10.8	13.9	11.9	10.3
Conductivity (field)	µS/cm				-	-	-	686	634	894	530
pH (Field)	-		6.5-8.5		-	-	-	7.15	7.18	6.7	6.68



Table 5: Groundwater Quality - Lower Bedrock

	Unit	RDL	ODWQS	RUC	TW04-1									
					2017-06-07	2017-09-29	2018-06-11	2018-11-05	2019-05-29	2019-10-28	2020-05-27	2020-11-12	2021-06-28	2021-11-10
Metals														
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		<0.2	<0.2	<0.2	0.3	<0.2	70.1	<0.2	<0.2	-	-
Barium (Filtered)	µg/L	0.01	1000	282	18.9	44.6	19.4	30.9	19	90	16.2	30	22	24
Boron (Filtered)	µg/L	0.2	5000	2506	15	33	22	1240	12	305,000	13	<2	13	11
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			97,700	150,000	110,000	399,000	120,000	0.004	93,100	114,000	111,000	121,000
Cadmium (Filtered)	µg/L	0.003	5		<0.003	<0.003	0.01	0.005	<0.003	0.39	<0.003	<0.003	-	-
Chloride	µg/L	200	250000	126800	2000	11,000	2000	38,000	3000	43,000	2000	7000	6200	5600
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.56	0.75	0.23	0.23	0.14	1.2	0.22	0.14	-	-
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.44	0.72	1.48	1.02	0.9	77	0.6	0.8	-	-
Iron (Filtered)	µg/L	2	300	160	14	37	592	3030	42	1910	<7	21	12	6
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.03	0.12	1.43	0.1	0.02	0.11	0.03	0.07	-	-
Manganese (Filtered)	µg/L	0.01	50	30.28	0.12	29	127	472	0.53	31,000	0.57	1.83	-	-
Magnesium (Filtered)	µg/L	1			1670	3650	1560	36,300	1880	31.3	1620	2490	2160	2190
Mercury (Filtered)	µg/L	0.01	1		-	-	-	-	<10	0.4	-	-	-	-
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	9			-	-	-	-	-	-	40	-	-	-
Potassium (Filtered)	µg/L	2			871	2530	876	4310	820	7310	765	1360	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101327	2910	9830	2360	78,500	2750	13	2420	3200	3700	2700
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		<2	2	<2	4	3	4	2	-	-	-
Inorganics														
Alkalinity (as CaCO3)	mg/L	2	500	381	249	325	231	407	272	436	233	271	241	272
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	-	286	312
Solids - Total Dissolved (TDS)	mg/L	3	500	390	243	391	257	1010	280	968	257	380	269	292
Oxygen Demand - Chemical (COD)	mg/L	5			<8	9	<8	11	<8	24	<8	<8	<5	20
Solids - Total Suspended (TSS)	mg/L	2			-	-	-	-	-	-	-	-	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	5		1	2	2	8	2	8	1	2	3.4	2.3
Oxygen Demand - Biological (BOD)	mg/L	2			-	-	-	-	-	-	-	-	-	-
Phenols (4AAP)	mg/L	0.002			-	-	-	-	-	-	-	-	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	3	34	5	310	9	340	6	15	9	7
Ammonia	mg/L	0.01			<0.1	0.6	<0.1	0.6	<0.1	0.2	<0.1	<0.1	0.02	0.05
Nitrate (as N)	mg/L	0.05	10	3.38	0.62	1.36	1.11	1.56	1.87	1.33	4.4	3.89	1.74	6.7
Nitrite (as N)	mg/L	0.03	1		-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			-	-	-	-	-	-	-	-	-	-
Conductivity (lab)	µS/cm	1			457	693	444	1320	529	1360	459	559	520	564
pH (Lab)	-	0.05	6.5-8.5		7.7	7.76	7.93	7.51	8.01	7.72	7.8	7.67	7.75	7.89
Field														
DO (Field)	mg/L				-	-	-	-	7.5	6.5	8.8	7.6	5.11	9.41
Redox Potential (Field)	mV				-	-	-	-	189	155	103	196	57	11
Temp (Field)	°C				-	-	-	-	9.7	12.1	13.3	12.1	15.6	10
Conductivity (field)	µS/cm				-	-	-	-	400	1107	380	374	512	254
pH (Field)	-		6.5-8.5		-	-	-	-	7.4	7.07	7.53	8.45	7.11	7.21



Table 5: Groundwater Quality - Lower Bedrock

	Unit	RDL	ODWQS	RUC	TW05-1									
					2017-06-07	2017-09-29	2018-06-11	2018-11-05	2019-05-29	2019-10-28	2020-05-27	2020-11-12	2021-06-28	2021-11-10
Metals														
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		0.9	0.4	0.6	0.3	0.4	5.97	0.3	0.4	-	-
Barium (Filtered)	µg/L	0.01	1000	282	38.3	48.1	32.4	92	27.3	374	42.8	30.2	28	29
Boron (Filtered)	µg/L	0.2	5000	2506	1560	1000	1830	77	1490	57,900	2330	1570	4600	4070
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			517,000	484,000	466,000	295,000	475,000	<0.003	533,000	482,000	444,000	449,000
Cadmium (Filtered)	µg/L	0.003	5		<0.003	<0.003	0.007	0.007	<0.003	<0.08	<0.003	<0.003	-	-
Chloride	µg/L	200	250000	126800	150,000	150,000	97,000	150,000	160,000	170,000	230,000	190,000	158,000	157,000
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.84	0.93	0.26	0.21	0.25	<0.2	0.33	0.25	-	-
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.45	1.25	0.74	1.11	2.3	1450	2.8	0.6	-	-
Iron (Filtered)	µg/L	2	300	160	14,000	7180	6110	<7	6360	573	4160	3480	7460	3890
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.04	0.07	0.04	0.06	0.02	<0.01	0.07	0.06	-	-
Manganese (Filtered)	µg/L	0.01	50	30.28	1200	804	677	24.1	852	11,700	1180	547	-	-
Magnesium (Filtered)	µg/L	1			62,700	43,900	52,600	7260	48,000	117	77,800	52,100	105,000	91,400
Mercury (Filtered)	µg/L	0.01	1		-	-	-	-	<10	<0.2	-	-	-	-
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	9			-	-	-	-	-	-	<30	-	-	-
Potassium (Filtered)	µg/L	2			7010	5430	6250	2690	4920	7950	6230	5710	-	-
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101327	99,100	73,100	91,600	22,800	82,900	3	251,000	85,400	143,000	132,000
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		<2	3	<2	<2	3	<2	2	-	-	-
Inorganics														
Alkalinity (as CaCO3)	mg/L	2	500	381	418	425	405	445	451	413	435	412	450	496
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	-	1540	1500
Solids - Total Dissolved (TDS)	mg/L	3	500	390	2090	2240	1980	2480	2390	2670	2350	2560	1530	1500
Oxygen Demand - Chemical (COD)	mg/L	5			32	32	24	37	32	25	43	39	39	38
Solids - Total Suspended (TSS)	mg/L	2			-	-	-	-	-	-	-	-	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	5		14	12	9	8	12	11	16	12	8.6	7.2
Oxygen Demand - Biological (BOD)	mg/L	2			-	-	-	-	-	-	-	-	-	-
Phenols (4AAP)	mg/L	0.002			-	-	-	-	-	-	-	-	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	930	760	460	940	950	1100	1100	1200	973	1010
Ammonia	mg/L	0.01			0.7	0.5	<0.1	1.2	0.7	0.6	1	0.8	1.29	1.34
Nitrate (as N)	mg/L	0.05	10	3.38	<0.06	0.84	0.38	0.34	<0.06	<0.06	<0.06	<0.06	1	<0.05
Nitrite (as N)	mg/L	0.03	1		-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			-	-	-	-	-	-	-	-	-	-
Conductivity (lab)	µS/cm	1			2930	2670	2250	2650	2570	2800	2620	2780	2750	2690
pH (Lab)	-	0.05	6.5-8.5		7.12	7.44	7.47	7.17	7.08	7.62	7.18	7.21	7.36	7.63
Field														
DO (Field)	mg/L				-	-	-	-	5.7	6.9	6.1	5.6	5.98	5.74
Redox Potential (Field)	mV				-	-	-	-	20	122	76	-8	85	63
Temp (Field)	°C				-	-	-	-	9.1	10.9	10.6	10.9	12.4	9.6
Conductivity (field)	µS/cm				-	-	-	-	2130	221	2072	1831	2354	1101
pH (Field)	-		6.5-8.5		-	-	-	-	6.81	6.65	7.08	7.56	6.9	6.86



Table 5: Groundwater Quality - Lower Bedrock

	Unit	RDL	ODWQS	RUC	TW06-1 2017-06-07	TW06-1 2017-09-29	TW06-1 2018-06-11	TW06-1 2019-05-29	TW06-1 2019-10-28	TW06-1 2020-05-27	TW06-1 2020-11-12	TW06-1 2021-06-28	TW06-1 2021-11-10
Metals													
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		<0.2	<0.2	<0.2	<0.2	0.6	<0.2	<0.2	<0.1	<0.1
Barium (Filtered)	µg/L	0.01	1000	282	138	297	225	117	393	103	279	296	301
Boron (Filtered)	µg/L	0.2	5000	2506	33	113	56	23	145	29	91	110	136
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			103,000	166,000	149,000	115,000	253,000	105,000	178,000	178,000	160,000
Cadmium (Filtered)	µg/L	0.003	5		0.014	0.026	0.012	0.016	0.056	<0.003	0.026	0.019	0.024
Chloride	µg/L	200	250000	126800	3000	39,000	17,000	5000	55,000	5000	34,000	38,400	27,300
Chromium (III+VI) (Filtered)	µg/L	0.03	50		1.01	0.77	0.12	0.11	0.32	0.17	0.17	<1	<1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.77	3.11	1.07	1	1	0.9	0.9	1.9	1.1
Iron (Filtered)	µg/L	2	300	160	60	13	<7	12	221	13	132	17	26
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.16	0.2	<0.01	<3	0.34	0.05	0.1	0.05	0.08
Manganese (Filtered)	µg/L	0.01	50	30.28	241	950	374	568	4360	3.71	1210	1190	1390
Magnesium (Filtered)	µg/L	1			2990	7710	5050	3650	13,600	3680	9080	9900	10,500
Mercury (Filtered)	µg/L	0.01	1		<10	70	0.03	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	9			<30	40	<30	<30	4	30	<3	90	30
Potassium (Filtered)	µg/L	2			2540	4520	4010	2330	8140	2280	7720	5000	7400
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101327	4210	17,300	8600	4200	38,000	5740	21,000	24,800	20,300
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		2	3	<2	0.02	3	5	<2	<5	<5
Inorganics													
Alkalinity (as CaCO3)	mg/L	2	500	381	239	355	292	399	534	266	454	352	392
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	486	443
Solids - Total Dissolved (TDS)	mg/L	3	500	390	274	526	380	509	806	300	609	505	467
Oxygen Demand - Chemical (COD)	mg/L	5			<8	<8	<8	<8	16	<8	14	11	16
Solids - Total Suspended (TSS)	mg/L	2			-	-	-	-	-	-	-	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	5		2	2	3	2	8	2	5	5.9	4.2
Oxygen Demand - Biological (BOD)	mg/L	2			-	-	-	-	-	-	-	-	-
Phenols (4AAP)	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	6	82	35	12	110	10	80	90	45
Ammonia	mg/L	0.01			0.2	0.7	0.5	0.6	5.4	<0.1	4.5	1.07	3.45
Nitrate (as N)	mg/L	0.05	10	3.38	1.19	0.16	1.85	2.58	0.08	3.43	0.98	1.03	3.5
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	0.22	0.16	<0.03	<0.03	0.44	0.19	0.07
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			<0.5	1.1	0.8	0.8	6.4	<0.5	5.4	1.4	4
Conductivity (lab)	µS/cm	1			483	862	656	817	1270	530	977	950	882
pH (Lab)	-	0.05	6.5-8.5		7.62	7.54	7.83	7.71	7.8	7.85	7.47	7.52	7.57
Field													
DO (Field)	mg/L				-	-	-	4.5	7	7	6.1	2.19	3.18
Redox Potential (Field)	mV				-	-	-	126	164	84	88	62	33
Temp (Field)	°C				-	-	-	9.6	11.4	13.9	11.4	14.8	10.4
Conductivity (field)	µS/cm				-	-	-	650	959	438	660	890	383
pH (Field)	-		6.5-8.5		-	-	-	7.38	7.03	7.46	7.25	6.89	6.82



Table 5: Groundwater Quality - Lower Bedrock

	Unit	RDL	ODWQS	RUC	TW07-1								
					2016-10-26	2017-09-29	2018-06-11	2019-05-29	2019-10-28	2020-05-27	2020-11-12	2021-06-28	2021-11-10
Metals													
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2
Barium (Filtered)	µg/L	0.01	1000	282	173	173	182	174	15.7	158	165	189	188
Boron (Filtered)	µg/L	0.2	5000	2506	21	24	68	24	2	24	9	25	41
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			97,700	102,000	123,000	102,000	14,100	91,400	97,300	98,500	101,000
Cadmium (Filtered)	µg/L	0.003	5		<0.003	<0.003	<0.003	0.003	<0.003	0.026	<0.003	<0.015	<0.015
Chloride	µg/L	200	250000	126800	15,000	14,000	18,000	12,000	13,000	13,000	12,000	14,100	14,500
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.37	0.62	0.18	0.12	<0.08	0.19	0.08	<1	<1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.41	0.97	1.02	1.8	<0.2	1.7	1.6	0.4	0.4
Iron (Filtered)	µg/L	2	300	160	204	33	330	15	<7	<7	24	317	353
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.05	0.05	<0.01	<3	<0.01	0.01	0.11	0.04	0.03
Manganese (Filtered)	µg/L	0.01	50	30.28	6.59	3.8	78.9	2.39	0.57	0.28	5.84	11	11
Magnesium (Filtered)	µg/L	1			4940	5260	5670	4860	668	4600	4070	4930	4910
Mercury (Filtered)	µg/L	0.01	1		<0.01	30	<0.01	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	9			<30	40	<30	<30	<3	40	<3	20	<10
Potassium (Filtered)	µg/L	2			1170	1260	1390	1210	120	1240	1270	1100	1200
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101327	8230	9080	10,600	8400	1300	9330	7340	9000	8900
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		3	<2	5	0.05	<2	5	4	<5	<5
Inorganics													
Alkalinity (as CaCO3)	mg/L	2	500	381	253	252	238	244	231	229	224	222	247
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	267	273
Solids - Total Dissolved (TDS)	mg/L	3	500	390	291	283	306	283	303	240	283	264	270
Oxygen Demand - Chemical (COD)	mg/L	5			11	<8	<8	<8	8	<8	<8	<5	12
Solids - Total Suspended (TSS)	mg/L	2			-	-	-	-	-	-	-	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	5		2	2	2	2	<1	2	2	3.5	2.8
Oxygen Demand - Biological (BOD)	mg/L	2			-	-	-	-	-	-	-	-	-
Phenols (4AAP)	mg/L	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	16	20	38	18	17	11	19	18	16
Ammonia	mg/L	0.01			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.02	0.01
Nitrate (as N)	mg/L	0.05	10	3.38	0.09	<0.06	0.17	<0.06	<0.06	<0.06	0.1	0.13	<0.05
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	0.2
Conductivity (lab)	µS/cm	1			517	507	511	528	513	501	487	510	522
pH (Lab)	-	0.05	6.5-8.5		7.64	7.62	7.92	7.85	8.07	8.02	7.82	7.89	7.85
Field													
DO (Field)	mg/L				-	-	-	10.3	6.3	5.5	3.9	2.23	4.56
Redox Potential (Field)	mV				-	-	-	-14	118	211	21	-4	21
Temp (Field)	°C				-	-	-	8.9	11.7	14.7	11.7	11.9	9.2
Conductivity (field)	µS/cm				-	-	-	430	395	411	337	519	229
pH (Field)	-		6.5-8.5		-	-	-	7.45	6.72	7.65	7.98	7.29	7.33



Table 5: Groundwater Quality - Lower Bedrock

	Unit	RDL	ODWQS	RUC	TW08-1												
					2014-12-23	2015-05-19	2015-11-03	2016-05-19	2016-10-26	2017-06-07	2017-09-29	2018-06-11	2019-10-28	2020-05-27	2020-11-12	2021-06-28	2021-11-10
Metals																	
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	0.9	<0.2	<0.2	<0.1	<0.1
Barium (Filtered)	µg/L	0.01	1000	282	36.9	50	93	30.1	55.1	33.5	44.2	44	61.1	37.2	60.3	32	42
Boron (Filtered)	µg/L	0.2	5000	2506	9.4	46.3	18.6	10	12	23	14	35	15	8	<2	9	12
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			101,000	99,400	134,000	89,900	114,000	90,500	105,000	109,000	120,000	86,800	106,000	98,300	114,000
Cadmium (Filtered)	µg/L	0.003	5		<0.003	<0.003	0.005	<0.003	<0.003	0.003	0.003	0.03	0.017	<0.003	<0.003	<0.015	<0.015
Chloride	µg/L	200	250000	126800	2900	8000	8000	2000	12,000	2000	5000	2000	7000	2000	7000	4300	2700
Chromium (III+VI) (Filtered)	µg/L	0.03	50		<0.03	0.04	<0.03	0.35	0.42	0.59	0.98	0.29	1.27	0.16	0.14	<1	<1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.54	0.45	0.89	0.43	0.41	0.91	0.66	0.61	2.7	0.8	0.8	0.6	0.6
Iron (Filtered)	µg/L	2	300	160	5	129	96	<7	139	19	95	141	1050	<7	10	14	22
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		<0.01	0.05	0.03	<0.01	0.04	0.03	0.07	0.04	1.07	0.01	0.06	0.04	0.03
Manganese (Filtered)	µg/L	0.01	50	30.28	4.89	127	158	2.8	40.1	12.9	34.1	12.1	86.3	0.67	3.57	1	9
Magnesium (Filtered)	µg/L	1			3090	3420	5500	2570	2730	2230	2890	2440	2980	2160	2360	2560	3060
Mercury (Filtered)	µg/L	0.01	1		0.04	<0.01	<0.01	<0.01	<0.01	<10	80	0.03	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	9			130	<30	60	<30	<30	<30	140	40	75	800	<3	120	270
Potassium (Filtered)	µg/L	2			628	908	2620	670	1330	645	993	667	1370	616	1700	600	700
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101327	2610	3240	5900	2060	3750	1800	2950	1900	3340	1770	3060	2500	2700
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		8	<2	13	<2	7	3	7	11	22	39	4	<5	<5
Inorganics																	
Alkalinity (as CaCO3)	mg/L	2	500	381	280	287	336	213	255	233	241	234	247	409	268	225	279
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	-	-	-	-	256	298
Solids - Total Dissolved (TDS)	mg/L	3	500	390	343	314	403	271	297	231	277	269	297	254	283	242	281
Oxygen Demand - Chemical (COD)	mg/L	5			8	<8	14	<8	<8	<8	<8	<8	8	<8	<5	14	
Solids - Total Suspended (TSS)	mg/L	2			-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	5		<1	<1	2.4	<1	<1	2	1	1	<1	1	1	2.6	1.7
Oxygen Demand - Biological (BOD)	mg/L	2			-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (4AAP)	mg/L	0.002			<0.002	0.004	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	6	3	15	5	8	3	5	4	7	4	9	6	6
Ammonia	mg/L	0.01			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	0.01
Nitrate (as N)	mg/L	0.05	10	3.38	1.63	0.93	1.14	0.46	1.59	0.45	1.29	0.61	1.21	0.71	2	1.37	1.22
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.3	0.4
Conductivity (lab)	µS/cm	1			512	550	662	453	527	423	487	438	522	455	483	469	542
pH (Lab)	-	0.05	6.5-8.5		8.15	7.97	7.52	8.12	7.48	7.68	7.87	7.94	8.03	8.02	7.85	7.85	7.73
Field																	
DO (Field)	mg/L				-	-	-	-	-	-	-	-	7.2	7.6	8.6	8.18	6.62
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	118	166	106	114	57
Temp (Field)	°C				-	-	-	-	-	-	-	-	12.1	10.6	12.1	12.4	10.4
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	413	419	327	456	237
pH (Field)	-		6.5-8.5		-	-	-	-	-	-	-	-	7.23	7.84	7.96	7.42	7.2



Table 5: Groundwater Quality - Lower Bedrock

	Unit	RDL	ODWQS	RUC	TW09-1									
					2016-10-26	2017-06-07	2017-09-29	2018-06-11	2019-05-29	2019-10-28	2020-05-27	2020-11-12	2021-06-28	2021-11-10
Metals														
Aluminium (Filtered)	µg/L	10	100		-	-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	6		-	-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	25		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1
Barium (Filtered)	µg/L	0.01	1000	282	106	112	107	134	110	109	112	118	116	110
Boron (Filtered)	µg/L	0.2	5000	2506	22	19	21	105	22	25	20	13	24	23
Beryllium (Filtered)	µg/L	0.02			-	-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10			108,000	131,000	114,000	132,000	114,000	108,000	102,000	104,000	105,000	101,000
Cadmium (Filtered)	µg/L	0.003	5		<0.003	<0.003	0.004	<0.003	<0.003	0.01	<0.003	0.004	<0.015	<0.015
Chloride	µg/L	200	250000	126800	19,000	17,000	17,000	19,000	18,000	18,000	17,000	17,000	15,100	10,000
Chromium (III+VI) (Filtered)	µg/L	0.03	50		0.3	0.51	0.65	0.11	0.34	0.15	0.15	0.14	<1	<1
Cobalt (Filtered)	µg/L	0.002			-	-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1000		0.09	0.22	41.5	0.65	0.8	0.8	0.5	1	0.3	0.5
Iron (Filtered)	µg/L	2	300	160	156	25	122	<7	9	7	<7	44	10	15
Lithium (Filtered)	µg/L	1			-	-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	10		0.02	0.02	5.23	<0.01	<3	0.02	<0.01	0.05	0.03	0.03
Manganese (Filtered)	µg/L	0.01	50	30.28	38	9.94	13.1	1.13	1.94	3.4	0.05	27.5	11	12
Magnesium (Filtered)	µg/L	1			5260	4470	5490	5140	5290	5100	4870	4560	5010	4620
Mercury (Filtered)	µg/L	0.01	1		<0.01	<10	140	<0.01	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	9			<30	<30	40	<30	<30	<3	100	<3	<10	<10
Potassium (Filtered)	µg/L	2			1040	1110	1130	1300	1240	1840	1040	1220	1000	1000
Silicon (Filtered)	µg/L	10			-	-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	50		-	-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10	200000	101327	7740	7410	8320	8060	8590	9640	8160	7420	7300	6900
Silver (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01			-	-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1			-	-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2			-	-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	20		-	-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	5000		2	<2	321	<2	0.01	3	<2	2	<5	<5
Inorganics														
Alkalinity (as CaCO3)	mg/L	2	500	381	268	254	243	253	251	237	241	235	229	256
Hardness (as CaCO3) (Filtered)	mg/L	0.05	500		-	-	-	-	-	-	-	-	283	271
Solids - Total Dissolved (TDS)	mg/L	3	500	390	334	297	320	343	300	303	343	300	276	265
Oxygen Demand - Chemical (COD)	mg/L	5			<8	10	<8	<8	<8	<8	12	<8	<5	7
Solids - Total Suspended (TSS)	mg/L	2			-	-	-	-	-	-	-	-	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	5		1	1	2	2	1	<1	2	2	4.4	2
Oxygen Demand - Biological (BOD)	mg/L	2			-	-	-	-	-	-	-	-	-	-
Phenols (4AAP)	mg/L	0.002			0.002	0.004	<0.002	<0.002	<0.002	<0.002	0.004	<0.002	<0.002	<0.002
Sulphate	mg/L	0.2	500	253	25	26	32	26	27	28	22	24	19	16
Ammonia	mg/L	0.01			<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.03	0.02
Nitrate (as N)	mg/L	0.05	10	3.38	0.32	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.14	<0.05	<0.05
Nitrite (as N)	mg/L	0.03	1		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	0.1
Conductivity (lab)	µS/cm	1			560	527	559	572	544	543	564	511	533	511
pH (Lab)	-	0.05	6.5-8.5		7.59	7.63	7.67	7.93	7.9	8.02	8.1	7.77	7.83	7.9
Field														
DO (Field)	mg/L				-	-	-	-	9.2	6.3	6.1	5	2.47	3.2
Redox Potential (Field)	mV				-	-	-	-	85	179	209	204	61	16
Temp (Field)	°C				-	-	-	-	9.1	12.5	13.2	12.5	11.5	8.8
Conductivity (field)	µS/cm				-	-	-	-	311	410	527	323	527	227
pH (Field)	-		6.5-8.5		-	-	-	-	7.59	6.42	7.62	8.2	7.25	7.29



Table 7: Groundwater Quality - PWQO

	Unit	RDL	PWQO	TW06-2								
				2016-10-26	2018-06-11	2018-11-05	2019-05-29	2019-10-28	2020-05-27	2020-11-12	2021-06-28	2021-11-10
Metals												
Aluminium (Filtered)	µg/L	10	15 75	-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	20	-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	5	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	0.4	0.2	0.2
Barium (Filtered)	µg/L	0.01		360	152	354	114	287	157	241	237	128
Boron (Filtered)	µg/L	0.2	200	267	256	175	80	359	217	361	193	218
Beryllium (Filtered)	µg/L	0.02	11	-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01		-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10		256,000	205,000	324,000	112,000	252,000	140,000	218,000	-	-
Cadmium (Filtered)	µg/L	0.003	0.1 0.5	0.021	0.007	0.012	0.007	0.012	0.004	0.014	0.017	<0.015
Chloride	µg/L	200		58,000	35,000	180,000	5000	110,000	24,000	53,000	36,400	24,400
Chromium (III+VI) (Filtered)	µg/L	0.03	8.9	0.37	0.1	0.23	0.12	0.14	0.11	<0.08	<1	<1
Cobalt (Filtered)	µg/L	0.002	0.9	-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1 5	1.69	1.35	2.08	0.9	1.9	1.2	2.4	2.6	2.5
Iron (Filtered)	µg/L	2	300	17	<7	39	11	10	<7	18	17	11
Lithium (Filtered)	µg/L	1		-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	1 3 5	<0.01	0.03	0.09	0.01	0.03	<0.01	0.03	0.06	<0.02
Manganese (Filtered)	µg/L	0.01		1970	34.9	1390	463	1320	74.7	781	-	-
Magnesium (Filtered)	µg/L	1		16,200	12,700	17,500	5330	15,100	12,000	12,600	-	-
Mercury (Filtered)	µg/L	0.01	0.2	<0.01	0.03	<10	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01	40	-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1	25	-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3	30	<30	50	<30	<30	30	40	<30	30	40
Potassium (Filtered)	µg/L	2		6840	11,400	5260	2320	4390	9650	5990	-	-
Silicon (Filtered)	µg/L	10		-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1		-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	100	-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10		47,700	27,500	39,900	7510	36,600	20,600	37,800	-	-
Silver (Filtered)	µg/L	0.01	0.1	-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01		-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1		-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2	0.3	-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	5	-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03	6	-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	20	2	<2	3	<2	2	2	<2	<5	<5
Inorganics												
Alkalinity (as CaCO3)	mg/L	2		438	392	434	276	415	361	446	419	343
Hardness (as CaCO3) (Filtered)	mg/L	0.05		-	-	-	-	-	-	-	582	388
Solids - Total Dissolved (TDS)	mg/L	3		1010	577	1091	489	909	454	757	577	411
Oxygen Demand - Chemical (COD)	mg/L	5		10	19	14	<8	11	16	14	9	29
Solids - Total Suspended (TSS)	mg/L	2		<2	<2	14	7	3	15	20	24	56
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1		-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2		<4	<4	5	<4	<4	<4	<4	3	3
Phenols (4AAP)	mg/L	0.001	0.001	0.002	0.001	0.005	<0.001	0.004	0.001	<0.001	<0.002	<0.002
Sulphate	mg/L	0.2		310	70	220	23	140	49	98	106	50
Ammonia	mg/L	0.01		1.2	1.2	1.1	0.4	0.7	1.3	1.6	0.16	0.1
Nitrate (as N)	mg/L	0.05		0.13	1.09	0.06	1.98	0.15	0.17	0.08	1.94	1.01
Nitrite (as N)	mg/L	0.03		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.07	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1		1.6	1.5	1.1	0.6	0.6	1.6	1.8	0.6	0.5
Conductivity (lab)	µS/cm	1		1390	919	1550	572	1350	783	1110	1080	783
pH (Lab)	-	0.05	6.5-8.5	7.24	7.92	7.41	8.04	7.77	7.97	7.74	7.72	7.88
Field												
DO (Field)	mg/L		5-50	-	-	-	4.2	7	6.3	8.3	2.82	3.84
Redox Potential (Field)	mV			-	-	-	118	167	124	55	53	29
Temp (Field)	°C			-	-	-	8.6	11.3	12.5	11.3	12.1	9.5
Conductivity (field)	µS/cm			-	-	-	517	1006	626	731	1012	341
pH (Field)	-		6.5-8.5	-	-	-	7.71	7.01	7.27	7.4	7.16	7.12



Table 7: Groundwater Quality - PWQO

	Unit	RDL	PWQO	TW07-2								
				2016-10-26	2018-06-11	2018-11-05	2019-05-29	2019-10-28	2020-05-27	2020-11-12	2021-06-28	2021-11-10
Metals												
Aluminium (Filtered)	µg/L	10	15 75	-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	20	-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	5	2.2	1.4	1.7	1.2	0.7	0.3	1	<3	1.7
Barium (Filtered)	µg/L	0.01		143	132	128	128	96.5	55.3	96.2	105	100
Boron (Filtered)	µg/L	0.2	200	605	1100	939	1250	1490	1250	1390	1500	1560
Beryllium (Filtered)	µg/L	0.02	11	-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01		-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10		246,000	384,000	341,000	339,000	263,000	257,000	244,000	-	-
Cadmium (Filtered)	µg/L	0.003	0.1 0.5	<0.003	0.004	<0.003	0.004	0.005	<0.003	0.003	<0.3	<0.015
Chloride	µg/L	200		130,000	170,000	150,000	280,000	130,000	130,000	140,000	176,000	138,000
Chromium (III+VI) (Filtered)	µg/L	0.03	8.9	0.53	0.23	0.13	0.14	0.15	<0.08	0.14	<3	<1
Cobalt (Filtered)	µg/L	0.002	0.9	-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1 5	0.51	0.36	0.82	1.2	0.3	1.2	0.7	<2	0.1
Iron (Filtered)	µg/L	2	300	7250	9540	7630	8410	267	93	1520	6410	5580
Lithium (Filtered)	µg/L	1		-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	1 3 5	0.05	0.02	<0.01	0.01	0.03	<0.01	0.06	<0.9	<0.04
Manganese (Filtered)	µg/L	0.01		1950	2810	2550	2470	2250	754	1660	-	-
Magnesium (Filtered)	µg/L	1		27,400	36,200	32,600	41,000	30,500	30,500	26,800	-	-
Mercury (Filtered)	µg/L	0.01	0.2	<0.01	0.09	<10	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01	40	-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1	25	-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3	30	<30	50	<30	220	40	250	150	170	30
Potassium (Filtered)	µg/L	2		2450	2730	3000	2460	2480	2430	2800	-	-
Silicon (Filtered)	µg/L	10		-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1		-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	100	-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10		87,100	92,700	94,500	127,000	123,000	108,000	114,000	-	-
Silver (Filtered)	µg/L	0.01	0.1	-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01		-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1		-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2	0.3	-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	5	-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03	6	-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	20	6	2	3	4	5	<2	3	<5	<5
Inorganics												
Alkalinity (as CaCO3)	mg/L	2		337	335	323	382	345	341	348	307	357
Hardness (as CaCO3) (Filtered)	mg/L	0.05		-	-	-	-	-	-	-	760	681
Solids - Total Dissolved (TDS)	mg/L	3		1070	1620	1351	1590	1320	1230	1200	939	888
Oxygen Demand - Chemical (COD)	mg/L	5		17	17	15	11	13	20	14	14	32
Solids - Total Suspended (TSS)	mg/L	2		19	23	16	224	19	254	200	134	44
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1		-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2		<4	<4	<4	<4	<4	<4	<4	<3	<3
Phenols (4AAP)	mg/L	0.001	0.001	0.001	0.003	0.004	0.007	0.002	0.005	<0.001	<0.002	<0.002
Sulphate	mg/L	0.2		400	560	490	520	460	470	410	362	360
Ammonia	mg/L	0.01		0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.14	0.16
Nitrate (as N)	mg/L	0.05		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.06	<0.05
Nitrite (as N)	mg/L	0.03		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.5	0.4
Conductivity (lab)	µS/cm	1		1460	1920	1740	2140	1730	1560	1610	17,100	1620
pH (Lab)	-	0.05	6.5-8.5	7.39	7.65	7.42	7.07	7.78	7.53	7.61	7.59	7.87
Field												
DO (Field)	mg/L		5-50	-	-	-	6.6	5.2	8.9	4.7	2.51	3.19
Redox Potential (Field)	mV			-	-	-	-15	162	211	-15	22	56
Temp (Field)	°C			-	-	-	8.5	11.9	13.4	11.9	11.9	11
Conductivity (field)	µS/cm			-	-	-	1694	1751	1438	1065	1575	669
pH (Field)	-		6.5-8.5	-	-	-	7.03	6.35	7.17	7.57	7.02	6.92



Table 7: Groundwater Quality - PWQO

	Unit	RDL	PWQO	TW09-2								
				2016-10-26	2018-06-11	2018-11-05	2019-05-29	2019-10-28	2020-05-27	2020-11-12	2021-06-28	2021-11-10
Metals												
Aluminium (Filtered)	µg/L	10	15 75	-	-	-	-	-	-	-	-	-
Antimony (Filtered)	µg/L	0.2	20	-	-	-	-	-	-	-	-	-
Arsenic (Filtered)	µg/L	0.1	5	0.2	<0.2	<0.2	0.4	<0.2	<0.2	0.2	<0.1	0.2
Barium (Filtered)	µg/L	0.01		263	237	280	487	210	205	205	276	259
Boron (Filtered)	µg/L	0.2	200	16	25	10	26	11	8	58	14	12
Beryllium (Filtered)	µg/L	0.02	11	-	-	-	-	-	-	-	-	-
Bismuth (Filtered)	µg/L	0.01		-	-	-	-	-	-	-	-	-
Calcium (Filtered)	µg/L	10		90,700	106,000	117,000	281,000	86,800	88,300	108,000	-	-
Cadmium (Filtered)	µg/L	0.003	0.1 0.5	<0.003	0.011	<0.003	0.064	<0.003	0.005	<0.003	<0.015	<0.015
Chloride	µg/L	200		5000	4000	4000	4000	4000	4000	5000	4500	6200
Chromium (III+VI) (Filtered)	µg/L	0.03	8.9	0.07	0.06	0.12	4.01	0.09	0.1	<0.08	2	1
Cobalt (Filtered)	µg/L	0.002	0.9	-	-	-	-	-	-	-	-	-
Copper (Filtered)	µg/L	0.02	1 5	0.41	0.33	0.26	8.1	0.7	0.9	0.5	0.2	1.9
Iron (Filtered)	µg/L	2	300	36	123	67	2820	17	<7	23	218	<5
Lithium (Filtered)	µg/L	1		-	-	-	-	-	-	-	-	-
Lead (Filtered)	µg/L	0.01	1 3 5	0.01	0.04	<0.01	2.49	0.04	0.02	0.01	0.08	0.47
Manganese (Filtered)	µg/L	0.01		12.04	19.4	27.6	273	7.26	0.32	25.8	-	-
Magnesium (Filtered)	µg/L	1		3610	3120	3510	8300	2870	2990	3670	-	-
Mercury (Filtered)	µg/L	0.01	0.2	<0.01	0.07	<10	<10	<10	<10	<10	<0.02	<0.02
Molybdenum (Filtered)	µg/L	0.01	40	-	-	-	-	-	-	-	-	-
Nickel (Filtered)	µg/L	0.1	25	-	-	-	-	-	-	-	-	-
Phosphorus (Filtered)	µg/L	3	30	<30	<30	<30	730	<30	300	290	680	640
Potassium (Filtered)	µg/L	2		908	674	858	1100	723	757	941	-	-
Silicon (Filtered)	µg/L	10		-	-	-	-	-	-	-	-	-
Strontium (Filtered)	µg/L	0.1		-	-	-	-	-	-	-	-	-
Selenium (Filtered)	µg/L	1	100	-	-	-	-	-	-	-	-	-
Sodium (Filtered)	µg/L	10		3200	3230	3100	3000	3090	3010	3380	-	-
Silver (Filtered)	µg/L	0.01	0.1	-	-	-	-	-	-	-	-	-
Tin (Filtered)	µg/L	0.01		-	-	-	-	-	-	-	-	-
Titanium (Filtered)	µg/L	0.1		-	-	-	-	-	-	-	-	-
Thallium (Filtered)	µg/L	0.2	0.3	-	-	-	-	-	-	-	-	-
Uranium (Filtered)	µg/L	0.001	5	-	-	-	-	-	-	-	-	-
Vanadium (Filtered)	µg/L	0.03	6	-	-	-	-	-	-	-	-	-
Zinc (Filtered)	µg/L	2	20	<2	3	<2	17	9	4	<2	<5	<5
Inorganics												
Alkalinity (as CaCO3)	mg/L	2		225	235	241	340	215	237	531	228	256
Hardness (as CaCO3) (Filtered)	mg/L	0.05		-	-	-	-	-	-	-	282	260
Solids - Total Dissolved (TDS)	mg/L	3		269	266	334	274	291	243	303	255	265
Oxygen Demand - Chemical (COD)	mg/L	5		10	<8	<8	<8	<8	14	13	69	71
Solids - Total Suspended (TSS)	mg/L	2		3	<2	3	2210	<2	3200	341	2000	1070
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1		-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2		<4	<4	<4	4	<4	4	<4	4	4
Phenols (4AAP)	mg/L	0.001	0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
Sulphate	mg/L	0.2		14	13	10	15	10	15	24	16	16
Ammonia	mg/L	0.01		0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.22	0.26
Nitrate (as N)	mg/L	0.05		0.28	<0.06	<0.06	0.2	0.09	0.07	0.21	0.38	0.16
Nitrite (as N)	mg/L	0.03		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	1.7
Conductivity (lab)	µS/cm	1		456	473	475	448	384	472	478	493	512
pH (Lab)	-	0.05	6.5-8.5	7.91	7.99	7.91	7.96	8.26	8.02	7.86	7.83	8
Field												
DO (Field)	mg/L		5-50	-	-	-	4.1	6.7	6	5.9	9.85	8.19
Redox Potential (Field)	mV			-	-	-	115	167	214	220	56	11
Temp (Field)	°C			-	-	-	10.8	11.9	13.8	11.9	14.8	9.1
Conductivity (field)	µS/cm			-	-	-	362	339	388	302	463	235
pH (Field)	-		6.5-8.5	-	-	-	7.82	6.59	7.79	8.55	7.61	7.54



Table 8: Surface Water Quality

	Unit	RDL	PWQO	SW Trigger	SW1 2017-06-07	SW1 2017-08-03	SW1 2017-09-29	SW1 2018-06-11	SW1 2018-08-16	SW1 2019-05-29	SW1 2019-09-02	SW1 2019-10-28	SW1 2020-05-27	SW1 2020-07-07	SW1 2020-07-13	SW1 2020-11-12	SW1 2021-06-28	SW1 2021-08-26	SW1 2021-11-10
Metals																			
Aluminium	µg/L	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	µg/L	0.2	20		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	µg/L	0.1	5	0.8	0.2	0.4	0.5	0.3	1.2	0.2	0.5	0.5	0.5	1.1	1.1	0.5	0.6	0.6	0.3
Barium	µg/L	0.01		88.5	61.3	79.1	110	60.9	153	60.8	95.5	59.9	77	119	119	69.9	76	82	80
Boron	µg/L	0.2	200	22.35	13	11	15	24	19	16	34	18	15	26	26	14	29	23	9
Beryllium	µg/L	0.02	11		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bismuth	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	µg/L	10		98000	85,100	112,000	115,000	96,500	141,000	70,800	117,000	81,000	74,500	132,000	132,000	104,000	89,400	-	85,400
Cadmium	µg/L	0.003	0.1 0.5	0.012	0.009	0.008	0.008	0.003	0.02	<0.003	0.019	0.003	0.003	<0.003	<0.003	<0.003	<0.015	<0.015	<0.015
Chloride	µg/L	200		22000	11,000	9000	7,000	7000	14,000	12,000	13,000	24,000	22,000	9000	9000	19,000	12,700	12,900	17,200
Chromium (III+VI)	µg/L	0.03	8.9	0.52	0.57	0.67	0.66	<0.03	0.61	0.11	0.21	0.15	0.3	<0.08	<0.08	<0.08	<1	<1	<1
Cobalt	µg/L	0.002	0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	µg/L	0.02	1 5	0.94	0.39	0.21	1.08	0.22	0.59	<0.2	0.9	0.5	0.4	0.7	0.7	0.5	0.4	<0.1	0.4
Iron	µg/L	2	300	410	69	180	786	100	2970	71	1510	106	34	934	934	119	603	707	125
Lithium	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	0.01	1 3 5	0.13	0.05	0.01	0.13	0.64	0.48	<0.01	0.09	0.12	0.02	<0.01	<0.01	0.09	0.08	0.04	0.72
Manganese	µg/L	0.01		154	10.7	81.4	1320	36.7	2280	19.3	639	16.8	53.3	826	826	34.7	172	-	15
Magnesium	µg/L	1		2950	2500	2710	2740	2160	3520	1960	2810	2390	2380	3390	3390	2810	2540	-	2490
Mercury (Filtered)	µg/L	0.01	0.2	10	200	<10	<10	0.03	<0.01	<10	<10	<10	<10	<10	<10	<10	<0.02	<0.02	<0.02
Molybdenum	µg/L	0.01	40		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	µg/L	0.1	25		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus total (P2O5)	µg/L	3	30	40	<30	<30	40	<30	157	<3	37	14	24	61	61	<3	30	<10	50
Potassium	µg/L	3		873	161	290	528	111	1320	581	660	2060	989	688	688	553	200	-	300
Silicon	µg/L	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	µg/L	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	µg/L	1	100		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	µg/L	10		13100	7950	6770	9890	5460	8270	6560	7640	10,900	13,400	8410	8410	10,200	8800	-	9600
Silver	µg/L	0.01	0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	µg/L	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	µg/L	0.2	0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	µg/L	0.001	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	µg/L	0.03	6		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	1	20	5	4	<2	12	<2	6	2	9	<2	3	<2	<2	2	14	19	13
Inorganics																			
Alkalinity (as CaCO3)	mg/L	2		213	202	248	276	215	331	204	273	164	205	295	295	218	247	269	203
Hardness (as CaCO3)	mg/L	0.05		197	-	-	-	-	-	-	-	-	-	-	-	-	234	253	224
Solids - Total Dissolved (TDS)	mg/L	1		300	280	334	323	286	440	206	329	286	283	363	363	283	254	271	237
Oxygen Demand - Chemical (COD)	mg/L	5		37.8	25	31	39	30	53	19	27	27	22	38	38	27	26	26	32
Solids - Total Suspended (TSS)	mg/L	2		14.3	<2	<2	8	<2	24	14	13	2	<2	7	7	12	3	4	6
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2		4	<4	<4	<4	<4	12	<4	5	<4	<4	4	4	<4	<3	<3	<3
Phenols (4AAP)	mg/L	0.001	0.001	0.003	0.001	<0.001	<0.001	0.001	0.011	0.003	0.006	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	mg/L	0.2		2	<2	<2	<2	<2	<2	6	3	33	<2	<2	<2	4	3	4	9
Ammonia, Unionized (Field)	mg/L	0.01	0.02		-	-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01
Ammonia	mg/L	0.01		0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.05	0.03	0.02
Nitrate (as N)	mg/L	0.05		0.13	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.05	0.1	<0.05
Nitrite (as N)	mg/L	0.03		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	0.06	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1		0.7	<0.5	<0.5	0.5	<0.5	1	<0.5	0.9	<0.5	<0.5	0.8	0.8	0.5	0.6	0.5	0.5
Conductivity (lab)	µS/cm	1		429	417	485	529	417	613	407	543	402	424	529	529	454	490	524	458
pH (Lab)	-	0.05	6.5-8.5		7.82	7.74	7.76	7.94	7.88	8.17	8	8.17	7.94	7.66	7.66	7.67	7.96	8.01	7.79
Field																			
DO (Field)	mg/L		5-50		-	-	-	-	-	6.3	4.57	5.98	6.01	-	4.66	6.21	6.49	6.48	9.17
Redox Potential (Field)	mV				-	-	-	-	-	111	-	225	25	-	120	210	67	130	20
Temp (Field)	°C				-	-	-	-	-	13	21.2	11.8	20.5	-	25.7	6.9	26.8	28	6.8
Conductivity (field)	µS/cm				-	-	-	-	-	324	749	411	414	-	550	321	485	545	204
pH (Field)	-		6.5-8.5		-	-	-	-	-	7.74	7.38	7.71	7.6	-	7.84	8.8	7.31	7.34	7.58



Table 8: Surface Water Quality

	Unit	RDL	PWQO	SW Trigger	SW3 2011-10-01	SW3 2012-05-15	SW3 2013-05-29	SW3 2013-10-30	SW3 2014-06-09	SW3 2014-11-14	SW3 2015-05-19	SW3 2016-05-16	SW3 2017-06-07	SW3 2017-08-03	SW3 2018-06-11	SW3 2019-05-29	SW3 2020-05-27	SW3 2021-11-10
Metals																		
Aluminium	µg/L	10			-	-	40	-	-	-	-	-	-	-	-	-	-	-
Antimony	µg/L	0.2	20		-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-
Arsenic	µg/L	0.1	5	0.8	-	-	0.7	1	0.8	0.6	0.9	0.5	0.4	0.5	1.1	0.2	0.4	0.8
Barium	µg/L	0.01		88.5	-	-	74.8	68	93.8	69.2	71.9	61.9	53.8	89.6	59.6	57.7	56.3	62
Boron	µg/L	0.2	200	22.35	-	-	118	298	176	53.9	209	307	225	328	822	125	371	287
Beryllium	µg/L	0.02	11		-	-	<0.02	-	-	-	-	-	-	-	-	-	-	-
Bismuth	µg/L	0.01			-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-
Calcium	µg/L	10		98000	-	-	132,000	-	-	-	147,000	134,000	128,000	154,000	196,000	113,000	122,000	113,000
Cadmium	µg/L	0.003	0.1 0.5	0.012	-	-	0.308	0.04	0.361	0.016	0.012	0.026	0.015	0.017	0.019	0.003	0.011	0.016
Chloride	µg/L	200		22000	19,000	37,000	61,000	34,000	71,000	43,000	51,000	53,000	42,000	67,000	74,000	62,000	76,000	80,300
Chromium (III+VI)	µg/L	0.03	8.9	0.52	-	-	<0.5	0.6	0.47	0.97	0.13	0.61	0.77	0.58	0.46	0.24	0.43	<1
Cobalt	µg/L	0.002	0.9		-	-	0.252	-	-	-	-	-	-	-	-	-	-	-
Copper	µg/L	0.02	115	0.94	-	-	1	3.1	0.98	1.94	0.58	3.04	0.97	0.65	1.39	0.8	0.8	1.5
Iron	µg/L	2	300	410	82	168	226	172	136	175	219	184	114	214	470	64	177	181
Lithium	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	0.01	11 5	0.13	-	-	0.5	2.1	1.59	1.56	0.4	0.58	1.43	0.78	1.23	<0.01	0.17	0.41
Manganese	µg/L	0.01		154	-	-	88	-	60.6	22	132	55.2	11.5	44.6	374	7.7	104	83
Magnesium	µg/L	1		2950	-	-	8230	-	-	-	9570	9920	7610	11,200	16,100	6710	10,600	8100
Mercury (Filtered)	µg/L	0.01	0.2	10	-	-	-	-	-	-	<0.01	0.01	150	<10	0.08	<10	<10	<0.02
Molybdenum	µg/L	0.01	40		-	-	0.11	-	-	-	-	-	-	-	-	-	-	-
Nickel	µg/L	0.1	25		-	-	2	-	-	-	-	-	-	-	-	-	-	-
Phosphorus total (P2O5)	µg/L	3	30	40	70	30	110	80	60	<30	35	40	40	<30	80	137	44	80
Potassium	µg/L	3		873	-	-	3340	-	-	-	3180	3100	3000	1480	4730	1680	3270	9000
Silicon	µg/L	10			-	-	2690	-	-	-	-	-	-	-	-	-	-	-
Strontium	µg/L	0.1			-	-	378	-	-	-	-	-	-	-	-	-	-	-
Selenium	µg/L	1	100		-	-	<1	-	-	-	-	-	-	-	-	-	-	-
Sodium	µg/L	10		13100	-	-	34,300	-	-	-	31,100	32,000	29,500	47,200	57,900	28,400	44,700	34,700
Silver	µg/L	0.01	0.1		-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-
Tin	µg/L	0.01			-	-	0.05	-	-	-	-	-	-	-	-	-	-	-
Titanium	µg/L	0.1			-	-	2.1	-	-	-	-	-	-	-	-	-	-	-
Thallium	µg/L	0.2	0.3		-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-
Uranium	µg/L	0.001	5		-	-	0.205	-	-	-	-	-	-	-	-	-	-	-
Vanadium	µg/L	0.03	6		-	-	0.34	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	1	20	5	-	-	3	13	9	4	3	14	7	3	5	4	3	17
Inorganics																		
Alkalinity (as CaCO3)	mg/L	2		213	172	293	231	78	305	187	301	250	249	308	328	251	260	209
Hardness (as CaCO3)	mg/L	0.05		197	-	-	364	-	-	-	-	-	-	-	-	-	-	316
Solids - Total Dissolved (TDS)	mg/L	1		300	563	446	543	671	657	586	503	551	454	1070	749	425	540	420
Oxygen Demand - Chemical (COD)	mg/L	5		37.8	26	29	40	38	<8	22	25	17	27	31	39	14	32	46
Solids - Total Suspended (TSS)	mg/L	2		14.3	5	<2	3	35	6	10	<2	5	62	31	17	2	10	26
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1			-	-	-	-	-	-	10.8	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2		4	5	15	<4	5	<4	<4	7	<4	<4	<4	<4	<4	4	<3
Phenols (4AAP)	mg/L	0.001	0.003	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.001	0.005	0.002	0.007	0.004	0.009	<0.001
Sulphate	mg/L	0.2		2	180	49	81	280	110	190	76	110	82	99	160	53	93	67
Ammonia, Unionized (Field)	mg/L	0.01	0.02		-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01
Ammonia	mg/L	0.01		0.1	<0.1	<0.1	0.3	<0.1	0.2	-	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	0.04
Nitrate (as N)	mg/L	0.05		0.13	<0.05	<0.05	<0.06	<0.06	0.07	<0.06	<0.06	0.15	<0.06	<0.06	<0.06	<0.06	<0.06	<0.05
Nitrite (as N)	mg/L	0.03		0.03	<0.06	<0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1		0.7	0.7	<0.5	1.7	1	0.8	1	0.6	0.7	0.5	0.9	<0.5	<0.5	<0.5	0.7
Conductivity (lab)	µS/cm			429	761	728	820	857	954	824	811	834	717	953	1080	724	814	800
pH (Lab)	-	0.05	6.5-8.5		8.01	8.11	8.18	8.06	8.04	8	7.95	4.76	8.09	7.79	7.92	8.17	7.88	7.72
Field																		
DO (Field)	mg/L		5-50		-	-	-	-	-	-	-	-	-	-	-	9.2	6.04	6.06
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-	-	115	60	43
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	-	-	13.1	20.2	6.7
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	-	-	586	817	372
pH (Field)	-		6.5-8.5		-	-	-	-	-	-	-	-	-	-	-	7.95	4.42	7.55



Table 8: Surface Water Quality

	Unit	RDL	PWQO	SW Trigger	SW8 2016-07-06	SW8 2017-06-07	SW8 2017-08-03	SW8 2017-09-29	SW8 2018-06-11	SW8 2019-05-29	SW8 2019-09-02	SW8 2019-10-28	SW8 2020-05-27	SW8 2020-07-07	SW8 2020-07-13	SW8 2020-11-12	SW8 2021-06-28	SW8 2021-11-10
Metals																		
Aluminium	µg/L	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	µg/L	0.2	20		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	µg/L	0.1	5	0.8	0.8	0.3	0.6	0.7	0.6	0.2	2.6	0.5	0.4	1.2	1.2	0.8	1	0.4
Barium	µg/L	0.01		88.5	74.8	70.3	103	108	81	51.3	88	60.5	72	109	109	90	49	64
Boron	µg/L	0.2	200	22.35	13	18	16	10	37	11	30	15	20	15	15	12	18	7
Beryllium	µg/L	0.02	11		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bismuth	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	µg/L	10		98000	82,900	79,700	110,000	98,300	92,700	74,800	71,600	68,900	69,800	105,000	105,000	98,000	70,500	79,600
Cadmium	µg/L	0.003	0.1 0.5	0.012	<0.003	0.006	0.004	0.005	0.013	0.006	0.01	0.098	<0.003	<0.003	<0.003	0.098	<0.015	<0.015
Chloride	µg/L	200		22000	3000	26,000	22,000	8000	17,000	63,000	16,000	22,000	19,000	3000	3000	15,000	4500	14,500
Chromium (III+VI)	µg/L	0.03	8.9	0.52	0.41	0.57	0.39	0.82	0.12	0.15	0.14	0.17	0.17	<0.08	<0.08	0.88	<1	<1
Cobalt	µg/L	0.002	0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	µg/L	0.02	1 5	0.94	0.82	1.08	0.54	0.62	0.93	<0.2	0.6	0.4	0.2	0.5	0.5	2.4	0.5	0.3
Iron	µg/L	2	300	410	402	80	433	660	371	67	1230	36	72	345	345	749	262	257
Lithium	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	0.01	1 3 5	0.13	0.04	0.12	0.04	0.08	0.08	0.08	0.38	0.15	<0.01	0.06	0.06	3.23	0.09	0.34
Manganese	µg/L	0.01		154	171	24.2	318	109	137	21.1	494	10.1	45.3	236	236	78.9	34	84
Magnesium	µg/L	1		2950	2910	2620	3070	2970	2420	1810	2950	2310	2180	2960	2960	2670	2440	2460
Mercury (Filtered)	µg/L	0.01	0.2	10	<0.01	120	<10	<10	0.06	<10	<10	<10	<10	<10	<10	<0.02	<0.02	<0.02
Molybdenum	µg/L	0.01	40		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	µg/L	0.1	25		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus total (P2O5)	µg/L	3	30	40	40	30	70	<30	<30	28	286	26	<500	38	38	106	40	30
Potassium	µg/L	3		873	217	259	326	621	256	1300	8640	1970	550	202	202	373	200	200
Silicon	µg/L	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	µg/L	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	µg/L	1	100		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	µg/L	10		13100	2940	15,100	13,800	5110	10,300	35,300	5860	8620	10,400	3500	3500	6480	3800	8700
Silver	µg/L	0.01	0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	µg/L	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	µg/L	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	µg/L	0.2	0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	µg/L	0.001	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	µg/L	0.03	6		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	µg/L	1	20	5	<2	5	3	10	3	3	4	<2	<2	4	4	12	21	11
Inorganics																		
Alkalinity (as CaCO3)	mg/L	2		213	194	192	235	223	196	195	168	139	179	256	256	202	177	191
Hardness (as CaCO3)	mg/L	0.05		197	-	-	-	-	-	-	-	-	-	-	-	-	186	209
Solids - Total Dissolved (TDS)	mg/L	1		300	249	274	351	300	274	303	300	274	243	306	306	291	175	215
Oxygen Demand - Chemical (COD)	mg/L	5		37.8	35	32	40	42	32	19	70	30	19	40	40	36	37	45
Solids - Total Suspended (TSS)	mg/L	2		14.3	8	4	14	4	10	8	83	3	4	137	137	23	6	6
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxygen Demand - Biological (BOD)	mg/L	2		4	<4	<4	<4	<4	<4	<4	34	<4	<4	<4	<4	<4	<3	<3
Phenols (4AAP)	mg/L	0.001	0.001	0.003	0.001	0.003	<0.001	0.003	0.003	0.004	0.009	0.003	-	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	mg/L	0.2		2	<1	<2	<2	<2	<2	<2	3	32	<2	<2	<2	3	7	1
Ammonia, Unionized (Field)	mg/L	0.01	0.02		-	-	-	-	-	<0.005	0.013	<0.005	<0.005	-	0.006	0.009	<0.01	<0.01
Ammonia	mg/L	0.01		0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.03	0.03	0.03
Nitrate (as N)	mg/L	0.05		0.13	0.07	0.16	<0.06	0.21	<0.06	<0.06	<0.06	1.65	<0.06	0.13	0.13	<0.06	<0.05	<0.05
Nitrite (as N)	mg/L	0.03		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1		0.7	0.7	0.7	<0.5	0.8	1.5	0.7	1.7	<0.5	<0.5	<0.5	<0.5	0.6	0.6	0.6
Conductivity (lab)	µS/cm	1		429	373	426	502	432	411	558	358	372	379	424	424	421	341	417
pH (Lab)	-	0.05	6.5-8.5		8.2	7.83	7.85	7.86	7.98	7.71	8.64	7.82	7.93	7.94	7.94	7.94	8.27	7.76
Field																		
DO (Field)	mg/L		5-50		-	-	-	-	-	9.4	7.81	8.86	6.69	-	9.03	9.65	13.88	10.35
Redox Potential (Field)	mV				-	-	-	-	-	140	-	203	73	-	115	208	67	20
Temp (Field)	°C				-	-	-	-	-	16.1	24.4	11.6	19.4	-	29	5.3	29.5	6.6
Conductivity (field)	µS/cm				-	-	-	-	-	480	323	305	380	-	459	248	340	191
pH (Field)	-		6.5-8.5		-	-	-	-	-	7.78	8.45	7.9	7.69	-	7.95	8.91	8.4	7.72



Appendix A

Monitoring and Screen Checklist

Fully accessible appended items are available upon request.

Appendix D-Monitoring and Screening Checklist

General Information and Instructions

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

Instructions: A complete checklist consists of:

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

Definition of Groundwater CEP:

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

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

Definition of Surface water CEP:

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

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

Monitoring Report and Site Information	
Waste Disposal Site (WDS) Name	Stoney Lake Road Landfill
Location (e.g. street address, lot, concession)	348 County Road 6, Lakefield
GPS Location (taken within the property boundary at front gate/ front entry)	Zone 17, 720969 m east, 4926536 m north
Municipality	The Township of Douro-Dummer
Client and/or Site Owner	The Corporation of the Township of Douro-Dummer
Monitoring Period (Year)	2021
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	A340901
Director's Order No.:	
Provincial Officer's Order No.:	

Other:			
Report Submission Frequency	<input checked="" type="radio"/> Annual <input type="radio"/> Other	Specify (Type Here):	
The site is: (Operation Status)	<input type="radio"/> Open <input type="radio"/> Inactive <input checked="" type="radio"/> Closed		
Is there an active waste transfer station at the site?	<input checked="" type="radio"/> Yes <input type="radio"/> No		
Does this WDS have a Closure Plan?	<input type="radio"/> Not yet submitted <input type="radio"/> Submitted and under review <input checked="" type="radio"/> Submitted and approved		
Total Approved Capacity	54,000	Units	Cubic Metres
Maximum Approved Fill Rate		Units	
Total Waste Received within Monitoring Period (Year)		Units	
Total Waste Received within Monitoring Period (Year) <i>Describe the methodology used to determine this quantity</i>			
Estimated Remaining Capacity		Units	
Estimated Remaining Capacity <i>Describe the methodology used to determine this quantity</i>			
Estimated Remaining Capacity <i>Date Last Determined</i>	Select Date		
Non-Hazardous Approved Waste Types	<input type="checkbox"/> Domestic <input checked="" type="checkbox"/> Industrial, Commercial & Institutional (IC&I) <input type="checkbox"/> Source Separated Organics (Green Bin) <input type="checkbox"/> Tires	<input type="checkbox"/> Contaminated Soil <input checked="" type="checkbox"/> Wood Waste <input type="checkbox"/> Blue Box Material <input type="checkbox"/> Processed Organics <input type="checkbox"/> Leaf and Yard Waste	<input type="checkbox"/> Food Processing/Preparation Operations Waste <input type="checkbox"/> Hauled Sewage Other: C&D Materials, Scrap Metal
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial <i>(separate waste classes by comma)</i>			

<p>Year Site Opened <i>(enter the Calendar Year <u>only</u>)</i></p>		<p>Current ECA Issue Date</p>	<p>9-Jun-2016</p>
<p>Is your Site required to submit Financial Assurance?</p>		<p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>	
<p>Describe how your WDS is designed.</p>		<p><input checked="" type="radio"/> Natural Attenuation only <input type="radio"/> Fully engineered Facility <input type="radio"/> Partially engineered Facility</p>	
<p>Does your Site have an approved Contaminant Attenuation Zone?</p>		<p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>	
<p>If closed, specify ECA, control or authorizing document closure date:</p>		<p>Closure Plan Dated September 2000</p>	
<p>Has the nature of the operations at the site changed during this monitoring period?</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>		
<p>If yes, provide details:</p>			

<p>Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p>
---	---

Groundwater WDS Verification:

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

Sampling and Monitoring Program Status:

<p>1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	
<p>2) All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA or other relevant authorizing/control document(s):</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If no, list exceptions below or attach information.</p>

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

3) a) Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document.	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Not Applicable
--	--

b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Applicable	If no, list exceptions below or attach additional information.
---	--	--

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

<p>4) All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	
---	---	--

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<p>5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p>	<p>Refer to Section 4.5 of the Annual Report. Reductions to the established monitoring program are proposed. A new shallow piezometer should be installed east of the Site and sampled to determine water quality that discharges to surface.</p>
<p>6) The site meets compliance and assessment criteria.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>Refer to Section 4.2.6 of the Annual Report. Groundwater is interpreted to discharge to surface, as such the intent of Guideline B-7 is considered to be satisfied.</p>
<p>7) The site continues to perform as anticipated. There have been no unusual trends/changes in measured leachate and groundwater levels or concentrations.</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p>	<p>Boron concentrations are increasing at monitoring well TW07-2.</p>

<p>1) Is one or more of the following risk reduction practices in place at the site:</p> <p>(a) There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or</p> <p>(b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or</p> <p>(c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation):</p> <p><i>i.</i> The site has developed stable leachate mound(s) and stable leachate plume geometry/ concentrations; and</p> <p><i>ii.</i> Seasonal and annual water levels and water quality fluctuations are well understood.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>Note which practice(s):</p>	<p><input type="checkbox"/> (a)</p> <p><input type="checkbox"/> (b)</p> <p><input checked="" type="checkbox"/> (c)</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input checked="" type="radio"/> Not Applicable</p>		

Groundwater CEP Declaration:

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

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

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

Select Date

Recommendations:

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

No changes to the monitoring program are recommended

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

Refer to Section 4.5 of the Annual Report.
Reductions to the established monitoring program are proposed.
A new shallow piezometer should be installed east of the Site and sampled to determine water quality that discharges to surface.

No Changes to site design and operation are recommended

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

Name:

Cameron MacDougall, P. Geo.

Seal:

Add Image



Signature:		Date:	25-Apr-2022
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CEP Contact Information:	Cameron MacDougall, P. Geo.		
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Company:	Cambium Inc.		
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Address:	194 Sophia St Peterborough, Ontario K9H 1E5		
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Telephone No.:	705-742-7900 x 212	Fax No. :	705-742-7907
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E-mail Address:	cameron.macdougall@cambium-inc.com		
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Co-signers for additional expertise provided:			
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Signature:		Date:	Select Date
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Signature:		Date:	Select Date
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Surface Water WDS Verification:

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

Name (s)	unevaluated wetlands the Galesburg Provincially Significant Wetland
-----------------	--

Distance(s)	partially on-site to the east and southwest 125 m east
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Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	<input checked="" type="radio"/> Yes <input type="radio"/> No	
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the ECA or relevant authorizing/control document(s) (if applicable):	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable	If no, specify below or provide details in an attachment.

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

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

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

<p>4) All field work for surface water investigations was done in accordance with SOP, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	
--	---	--

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

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

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

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. ECA limit, PWQO, background	e.g. X% above PWQO
iron total phosphorus boron	PWQO	Refer to Table 8
<p>6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>Where PWQO exceedances were observed these can be attributed to poor sampling conditions (i.e., shallow, and stagnant) and/or outside influences (i.e., road de-icing activities, and wetland environments).</p>

<p>7) All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	
<p>8) For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g., PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p> <p><input type="radio"/> Not Known</p> <p><input type="radio"/> Not Applicable</p>	<p>Refer to Section 4.2.5</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>Refer to Section 4.3.3.4 of the Annual Report.</p>

Surface Water CEP Declaration:

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

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

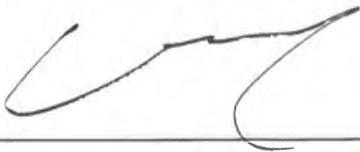
If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the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

Select Date

Recommendations:

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

<p><input type="radio"/> No Changes to the monitoring program are recommended</p> <p><input checked="" type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	<p>Refer to Section 4.5 of the Annual Report. Reductions to the established monitoring program are proposed. A new shallow piezometer should be installed east of the Site and sampled to determine water quality that discharges to surface.</p>
<p><input checked="" type="radio"/> No changes to the site design and operation are recommended</p> <p><input type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	

CEP Signature		
Relevant Discipline	Physical Geography	
Date:	25-Apr-2022	
CEP Contact Information:	Cameron MacDougall, P. Geo.	
Company:	Cambium Inc.	
Address:	194 Sophia St Peterborough, Ontario K9H 1E5	
Telephone No.:	(705) 742-7900 x212	
Fax No. :	(705) 742-7907	
E-mail Address:	cameron.macdougall@cambium-inc.com	
Save As		Print Form



Appendix B

Environmental Compliance Approval No.: A340901

Fully accessible appended items are available upon request.

Content Copy Of Original



Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement
climatique

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A340901

Issue Date: June 9, 2016

The Corporation of the Township of Douro-Dummer
894 South St P.O. Box 92
Warsaw, Ontario K0L 3A0

Site Location: Stoney Lake Road Landfill
Lot 21, Concession 4
Douro-Dummer Township, County of Peterborough

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

the use and operation of a 1.6 hectare site *Waste Disposal Site (landfill/processing/transfer)* within a total site area of 4.25 hectares.

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

" *Approval* " means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A";

" *Clean Wood* " means waste that is wood or a wood product that is not contaminated with chromated copper arsenate, ammoniacal copper arsenic pentachlorophenol, creosote or other wood preservative.

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

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

" *Dry Waste* " means *municipal waste*, limited to *clean wood*, concrete and masonry, bricks, cardboard, plaster and drywall, scrap metal, glass, plastic, shingles, ceramics and furniture from home and light commercial activity.

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

" *Ministry* " means the Ontario Ministry of the Environment and Climate Change;

" *Municipal Waste* " means the definition that is specified in Regulation 347 of the Environmental Protection Act.

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

" *Operator* " means any person, other than the *Owner's* employees, authorized by the *Owner* as

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

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

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

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

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

"*Putricible Waste*" means waste of vegetable or animal origin of a similar nature and characteristics, that is liable to become putrid, rotten or decayed;

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

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

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

" *Residual Waste* " means waste that is destined for final disposal;

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

" *Site* " means the entire waste disposal site, including the buffer lands, and contaminant attenuation zone at Stoney Lake Road Landfill, Lot 21, Concession 4, Douro-Dummer Township, County of Peterborough;

"*Trained Personnel*" means any *operator* at the *Transfer Station* who is knowledgeable and able to carry out any necessary duties, in the following through instruction and practice;

- (i) relevant waste management legislation, regulations and guidelines;
- (ii) occupational health and safety concerns pertaining to the waste to be handled;
- (iii) any environmental concerns pertaining to the *Transfer Station* and wastes to be transferred;
- (iv) emergency management procedures for the waste to be handled;
- (v) use and operation of any equipment to be used;
- (vi) operation and management of the *Transfer Station*, or areas within the *Transfer Station*, as per the specific job requirements of each individual *operator*, and which include procedures for receiving, screening, refusal, and handling of waste;
- (vii) use of the Emergency Response Plan, and in the procedures to be employed in the event of an emergency;
- (viii) *Transfer Station* specific operations and/or procedures; and
- (ix) the requirements of this *Approval*; and

"*Transfer Station*" means the operation and infrastructure comprising the processing of *dry waste* and the transfer station described in Items 7, 9, 10, 11, 12 and 13 of Schedule "A".

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

TERMS AND CONDITIONS

1. GENERAL

Compliance

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

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

In Accordance

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

Interpretation

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

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

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

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

Other Legal Obligations

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

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

Adverse Effect

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

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

Change of Ownership

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

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

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

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

Registration on Title Requirement

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

(15) (a) Within thirty (30) calendar days from the date of issuance of this *Approval*, the *Owner* shall submit to the *Director* a completed Certificate of Requirement which shall include:

- (i) a plan of survey prepared, signed and sealed by an Ontario Land Surveyor, which shows the area of the *Site* where waste has been or is to be deposited at the *Site*;
- (ii) proof of ownership of the *Site*;
- (iii) a letter signed by a member of the Law Society of Upper Canada or other qualified legal practitioner acceptable to the *Director*, verifying the legal description provided in the Certificate of Requirement;
- (iv) the legal abstract of the property; and
- (v) any supporting documents including a registerable description of the *Site*.

(b) Within fifteen (15) calendar days of receiving a Certificate of Requirement authorized by the *Director*, the *Owner* shall:

- (i) register the Certificate of Requirement in the appropriate Land Registry Office on the title to the property; and
- (ii) submit to the *Director* and the *District Manager*, written verification that the Certificate of Requirement has been registered on title.

Inspections by the *Ministry*

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

- (a) to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this *Approval* are kept;
- (b) to have access to, inspect, and copy any records required to be kept by the conditions of this *Approval*;
- (c) to inspect the *Site*, related equipment and appurtenances;
- (d) to inspect the practices, procedures, or operations required by the conditions of this *Approval*;
- and
- (e) to sample and monitor for the purposes of assessing compliance with the terms and conditions of this *Approval* or the *EPA*, the *OWRA*, the *PA*, the *SDWA* or the *NMA*.

Information and Record Retention

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

- (b) The *Owner* shall retain all documentation listed in Schedule "A" for as long as this *Approval* is valid.
- (c) All monthly summary reports of waste records collected are to be kept at the *Site* until they are included in the Annual Report.
- (d) The *Owner* shall retain employee training records as long as the employee is working at the *Site*.
- (e) The *Owner* shall make all of the above documents available for inspection upon request of *Ministry* staff.

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

- (a) an approval, waiver, or justification by the *Ministry* of any act or omission of any person that contravenes any term or condition of this *Approval* or any statute, regulation or other legal requirement; or
- (b) acceptance by the *Ministry* of the information's completeness or accuracy.

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

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

2. SITE OPERATION

Operation

(1) The *Site* shall be operated and maintained at all times including management and disposal of all

waste, in accordance with the *EPA, Regulation 347*, and the conditions of this *Approval*. At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

Signage

(2) A sign shall be posted and maintained at the *Transfer Station* in a manner that is clear and legible, and shall include the following information:

- (a) the name of the *Transfer Station* and *Owner*;
- (b) this *Approval* number;
- (c) the name of the *Operator*;
- (d) the normal hours of operation;
- (e) the allowable and prohibited waste types;
- (f) a telephone number to which complaints may be directed;
- (g) a twenty-four (24) hour emergency telephone number (if different from above); and
- (h) a warning against dumping outside the *Transfer Station*.

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

(4) All waste storage containers at the *Transfer Station* shall have a label or sign clearly identifying the contents.

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

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

(6) If at any time noise and vibration nuisances are generated at the *Transfer Station*, resulting in complaints received by this *Ministry* and validated by a Provincial Officer, the *Owner* shall take remedial action immediately.

Burning Waste Prohibited

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

Hours of Operation

(8) (a) Waste may be accepted at the *Transfer Station* between the hours of 7:00 a.m. and 5:00 p.m., Monday through Friday, except statutory holidays.

(b) Notwithstanding condition 2(7)(a) above, operation of grinding equipment and sorting machine shall not be carried out from 7 a.m. to 8 a.m.

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

Site Security

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

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

(12) If the introduction of waste containing *Putricible Waste* leads to attracting bears, the *Owner* shall take actions to bear proof the *Site* or discontinue accepting such waste.

3. EMPLOYEE/OPERATOR TRAINING

(1) A training plan for all employees that operate any aspect of the *Transfer Station* shall be developed and implemented by the *Owner* or the *Operator*.

(2) The *Owner* shall ensure that *Trained personnel* are available at all times during the hours of operation of this *Transfer Station*. *Trained personnel* shall supervise all transfer or processing of waste material at the *Transfer Station*.

(3) The *Owner* shall maintain a written or electronic record at the *Transfer Station* of training that was provided including:

- (i) date of training;
- (ii) name and signature of person who has been trained; and
- (iii) description of the training provided and who it was delivered by.

(4) Training records shall be made available to a *Provincial Officer* upon request.

4. COMPLAINTS RESPONSE PROCEDURE

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

(a) The *Owner* shall record and number each complaint, either electronically or in a separate log book, along with the following information:

- (i) the nature of the complaint;
- (ii) if the complaint is odour or nuisance related, the weather conditions and wind direction at the time of the complaint;
- (iii) the name, address and telephone number of the complainant (if provided); and
- (iv) the time and date of the complaint;

(b) The *Owner*, upon notification of the complaint, shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint, notify the *District Manager* of the complaint within 48 hours of receiving the complaint, and forward a formal reply to the complainant; and

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

similar incidents.

5. EMERGENCY RESPONSE PLAN

- (1) The Emergency Response Plan in the Design and Operations Report shall be implemented as required. The *Owner* shall provide copies of the Emergency Response Plan to the local Municipality and to the Fire Department within thirty (30) days of the date of issuance of this *Approval*.
- (2) The Emergency Response Plan shall be kept up to date, and a copy shall be retained and accessible to all staff at all times. Changes to the Emergency Response Plan shall be submitted to the *Director* for approval.
- (3) The equipment, materials and personnel requirements outlined in the Emergency Response Plan shall be immediately available on the *Transfer Station* at all times. The equipment shall be kept in a good state of repair and in a fully operational condition.
- (4) All staff that operate *the Transfer Station* shall be fully trained in the use of the contingency and Emergency Response Plan, and in the procedures to be employed in the event of an emergency.
- (5) The *Owner* shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation of this *Transfer Station* and immediately implement the emergency response plan if required.

6. INSPECTIONS, RECORD KEEPING AND REPORTING

- (1) Any information requested, by the *Director* or a *Provincial Officer*, concerning the *Site* and its operation under this *Approval*, including but not limited to any records required to be kept by this *Approval* shall be provided to the *Ministry*, upon request. **Waste Records**
- (2) A log shall be maintained, either electronically or in written format, and shall include the following information as a minimum:
 - (a) the date;
 - (b) quantity and source of waste received;
 - (c) quantity of waste at the *Transfer Station* at the end of the operating week;
 - (d) quantities and destination of each type of waste shipped from the *Transfer Station*;
 - (e) a record of inspections required by this *Approval*;
 - (f) a record of any spills or process upsets at the site, the nature of the spill or process upset and the action taken for the clean up or correction of the spill, the time and date of the spill or process upset, and for spills, the time that the *Ministry* and other persons were notified of the spill in fulfilment of the reporting requirements in the *EPA*;
 - (g) a record of any waste refusals which shall include; amounts, reasons for refusal and actions taken; and
 - (h) the signature of the *Trained Personnel* conducting the inspection and completing the report.

Inspection - *Transfer Station*

- (3) An inspection of the entire *Transfer Station* and all equipment on the *Transfer Station* shall be conducted each week the *Transfer Station* is in operation to ensure that: the *Transfer Station* is

secure; that the operation of the *Transfer Station* is not causing any nuisances; that the operation of the *Transfer Station* is not causing any adverse effects on the environment; and that the *Transfer Station* is being operated in compliance with this *Approval*. Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the *Transfer Station* if needed.

Inspections - Site

(4) The *Owner* shall inspect the *Site* for the following during the environmental monitoring time and after major storm events:

(a) a visual inspection of

- (i) integrity of the landfill cover;
- (ii) buffer area and adjacent properties;
- (iii) entrance gate and perimeter fencing;
- (iv) monitoring wells; and
- (v) storm water system;

(b) visual scan for evidence of leachate breakout/seepage; and

(c) litter pick-up.

Log Book

(5) A record of the inspections, including the following information, shall be kept in the weekly log book:

(a) the name and signature of person that conducted the inspection;

(b) the date and time of the inspection;

(c) a list of any deficiencies discovered;

(d) any recommendations for remedial action; and

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

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

Annual Report

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

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

(a) a drawing(s) of the Landfill indicating all landfill gas, groundwater and surface water monitoring locations;

(b) tables outlining monitoring locations, analytical parameters sampled and the frequency of sampling and measurements;

(c) an analysis and interpretation of the groundwater and surface water monitoring data, a review of the adequacy of the monitoring programs, conclusions of the monitoring data, and recommendations for any changes in monitoring programs that may be necessary;

(d) an assessment of surface water quality in respect to the PWQO;

- (e) an assessment of groundwater quality in relation to the Guideline and the Ontario Drinking Water Standard;
- (f) Landfill gas monitoring data;
- (g) a detailed monthly summary of the type and quantity of all incoming (including the source of the waste) and outgoing wastes at the *Transfer Station* and the destination of all outgoing wastes;
- (h) any environmental and operational problems, that could negatively impact the environment, encountered during the operation of the *Transfer Station* and during the facility inspections and any mitigative actions taken;
- (i) any changes to the Emergency Response Plan, the Design, Operations and Maintenance Report and the Closure Plan that have been approved by the *Director* since the last Annual Report; and
- (j) any recommendations to minimize environmental impacts from the operation of the *Transfer Station* and to improve *Transfer Station* operations and monitoring programs in this regard.

7. TRANSFER STATION DESIGN AND OPERATION

Approved Waste Types

- (1) (a) Only *dry waste* shall be accepted at the *Transfer Station* for processing.
 - (b) The *Owner* may accept Municipal Solid Non-Hazardous waste from Industrial, commercial and Institutions and residential apartment buildings for transfer. This waste shall only be unloaded onto a pad within the covered receiving building.
 - (c) An asphalt or concrete pad with concrete retaining walls shall be constructed for waste received as in condition 7 (1) (b), residual waste and cover material. The *Owner* may increase this area as necessary to operate the *Site* in an environmentally acceptable and safe manner as long as other approved activities are not compromised.
- (2) All incoming and outgoing wastes shall be inspected by *Trained personnel* prior to being received, transferred and/or shipped to ensure wastes are being managed and disposed of in accordance with this *Approval*, the *EPA* and *Reg. 347*.
- (3) The *Owner* shall ensure that all loads of waste are properly inspected by *Trained personnel* prior to acceptance at the *Site* and that the waste vehicles are directed to the appropriate areas for disposal or transfer of the waste. In the event that any waste load is refused, a record shall be made in the daily log book of the reason the waste was refused and the origin of the waste, if known.

Service Area

- (4) Only waste that is generated within the boundaries of the County of Northumberland, the County of Peterborough, the City of Kawartha Lakes, the Regional Municipality of Durham, the County of Haliburton and the County of Hastings may be accepted at the *Transfer Station*.

Capacity

- (5) No more than 800 tonnes of *dry waste* per day shall be accepted at the *Transfer Station*.
- (6) No more than 1,700 tonnes (6400 cubic meters) of *dry waste*, residual waste and processed materials, shall be stored or be present at the *Transfer Station* at any time. If for any reason waste and processed materials cannot be transferred from the *Transfer Station*, the *Transfer Station* shall

cease accepting waste.

(7) The total amount of *Residual Waste* arising out of the processing operations and ICI waste received and leaving the *Transfer Station* for final disposal shall not exceed 300 tonnes per day.

Shredding and Grinding

(8) Grinding at the *Transfer Station* is restricted to grinding shingles and *clean wood*.

(9) The *Owner* shall obtain an Environmental Compliance Approval for the grinding operation for the activities under Section 9 of the *EPA* (Air and Noise) .

Residual Waste

(10) (a) The total amount of *Residual Waste* arising out of the processing operations and leaving the *Transfer Station* for final disposal shall not exceed 300 tonnes per day.

(b) *Residual Waste* at the *Transfer Station* shall be stored **within the receiving building**.

(c) *Residual waste* shall be moved off-site from the *Transfer Station* within fourteen (14) days of its receipt.

(d) If *residual waste* contains putrescible waste, it shall be moved off-site from the *Transfer Station* within 72 hours of its receipt. If any adverse effects occur as a result of the presence of putrescible waste, the waste must be removed from the *Transfer Station* immediately.

Waste Diversion

(11) The *Owner* may remove material as necessary to improve waste diversion (e.g. wood, metal, cardboard etc.) from waste received under the condition 7 (1)(b).

Design, Operation and Maintenance Report

(12) The Design, Operation and Maintenance of the *Transfer Station* shall be in accordance with the documents in Schedule "A".

(13) The Design, Operations and Maintenance Report shall be retained at the *Site*, kept up to date through periodic revisions, and made available for inspection by *Ministry* staff. Changes to the Design, Operations and Maintenance Report shall be submitted to the *Director* for approval.

8. LANDFILL MONITORING

Compliance - Landfill Gas

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

(a) The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5 per cent by volume;

(b) The concentration of methane gas must be less than 1.0 per cent by volume in any on-site building or enclosed structure, and in the area immediately outside the foundation or basement floor of the building or structure, if the building or structure is accessible to any person or contains electrical equipment or a potential source of ignition; and

(c) The concentration of methane gas from the site must be less than 0.05 per cent by volume in any off-site building or enclosed structure, and in the area immediately outside the foundation or basement floor of the building or structure, if the building or structure is accessible to any person or contains electrical equipment or a potential source of ignition.

Compliance - Surface Water and Groundwater

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

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

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

Landfill Gas

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

(4) The *Owner* shall ensure that all on-Site enclosed buildings are equipped with appropriate dedicated gas monitoring devices.

(5) The *Owner* shall monitor landfill gas according to the environmental monitoring program outlined in Schedule "B".

Surface Water and Groundwater

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

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

Groundwater Wells and Monitors

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

(9) Any groundwater monitoring well included in the on-going monitoring program that is damaged

shall be assessed, repaired, replaced or decommissioned by the *Owner*, as required.

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

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

Trigger Mechanisms and Contingency Plans

(12) (a) Trigger mechanisms shall be in accordance with Schedule "C".

(b) Contingency plan in the event of a confirmed exceedance of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate shall be in accordance with Schedule "C".

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

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

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

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

Changes to the Monitoring Plan

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

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

(18) In the event any other changes to the environmental monitoring program are proposed outside of

the recommendation of the annual report, the *Owner* shall follow current *Ministry* procedures for seeking approval for amending the *Approval*.

9. CLOSURE PLAN

Closure Plan-Landfill

(1) Except as otherwise provided by these conditions, the *Site* shall be closed in accordance with the report titled "Closure Plan, Stoney Lake Road (North) Waste Disposal Site, prepared by Lakefield Research Limited, dated September 2000".

(2) This landfill has been closed for disposal of waste since July 31, 2001 and no waste shall be accepted for disposal at the *Site*.

Closure Plan-Transfer Station

(3) A Closure Plan shall be submitted to the *Director* for approval, with a copy to the *District Manager*, no later than six (6) months before the planned closure date of the *Transfer Station*. The Closure Plan shall include, at a minimum, a description of the work that will be done to facilitate closure of the *Transfer Station* and a schedule for completion of that work.

(4) The *Transfer Station* shall be closed in accordance with the approved Closure Plan.

(5) Within 10 days after closure of the *Transfer Station*, the *Owner* shall notify the *Director*, in writing, that the *Transfer Station* is closed and that the approved Closure Plan has been implemented.

SCHEDULE "A"

1. Application for a Provisional Certificate of Approval for a Waste Disposal Site signed by Mr. David Clifford, C.A.O. Clerk-Treasurer, Township of Douro-Dummer, dated April 07, 2002.

2. Closure Plan, Stoney Lake Road (North) Waste Disposal Site, prepared by Lakefield Research Limited, dated September 2000.

3. Township of Douro-Dummer, Report Addendum, prepared by Lakefield Research Limited, dated March 31, 2003.

4. Transfer/Deed of Land for Part of Lot 21, Concession 4, designated as Parts 1 & 2, Plan 45R-10681, dated February 27, 1996.

5. Memo from B.W. Metcalf, MOE, Water Resources Unit - Surface Water, Technical Support Section, Eastern Region, Re: Closure Plan review comments, dated March 19, 2001.

6. Memo from S. Ryan, MOE, Technical Support Section, Eastern Region, Re: Closure Plan review comments, dated June 13, 2001.

7. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated February 14, 2007, and signed by David Clifford, C.A.O., including the attached report entitled "Stoney Lake Road Landfill Site Transfer Station: Design, Operations and Maintenance Report" and all supporting documentation.

8. Fax dated May 8, 2007 from Mike Mundell, M & M Disposal Service, to Andrew Neill, MOE, with an alternate disposal location.

9. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated November 20, 2007, and signed by David Clifford, C.A.O., including the attached report entitled "Stoney Lake Road Transfer Station and Waste Processing Site. Design, Operations and Maintenance Report. November 2007."

10. e-mails from Kelly Dechert, Manager, Environmental Management Group Totten Sims Hubicki Associates to Senior Review Engineer Jim Chisholm dated December 12, 2007, January 4, 2008, January 10, 2008 (4:04pm) with attachment, January 18, 2008, and Feb. 4, 2008 (4:34pm).

11. e-mails from Senior Review Engineer Jim Chisholm to Kelly Dechert dated January 3, 2008, January 4, 2008 (2:33pm), January 10, 2008, January 11, 2008, January 18, 2008 (2:58pm), January 30, 2008 and Feb. 4, 2008 (4:17pm).

12. Letters signed by Kelly Dechert addressed to Senior Review Engineer Jim Chisholm dated December 12, 2007, January 3, 2008, January 15, 2008 and January 28, 2008.

13. Letter dated January 8, 2008 from Senior Review Engineer Jim Chisholm to David Clifford, C.A.O., the Corporation of the Township of Douro-Dummer.

14. Application for an Approval for a Waste Disposal Site signed by David Clifford, The Township of Douro-Dummer, dated September 28, 2011.

15. E-mail dated February 1, 2013 from Steven Gagne, Geo-Logic Inc. to Roman Lysiak, MOE with attached updated Design and Operations report dated January 2013, to address storm water and to include the addition of ICI waste.

16. Environmental Compliance Approval Application dated June 18, 2014 and signed David Clifford, CAO
The Corporation of the Township of Douro-Dummer, including the attached report titled "Stoney Lake Road Landfill Site Transfer Station, Processing Site. Design, Operations and Maintenance Report" dated May 2014.

17. Letter dated March 3, 2016 from Steven Gagne, Geo-Logic Inc. to Ranjani Munasinghe, P.Eng., MOECC.

18. Electronic mail dated April 06, 2016 (12:31 p.m.) from Steven Gagne, Geo-Logic Inc. to Ranjani Munasinghe, P.Eng., MOECC.

Schedule "B"
Groundwater Monitoring Program

Sampling Location	Parameters	Frequency
Short Suite Monitoring Wells: TW-2-1, TW-3-1, TW-4-1, TW-5-1,	water level, alkalinity, ammonia, barium, boron, calcium, chloride, conductivity, iron, magnesium, nitrate, pH, sodium, suspended solids (leachate only), Total Dissolved Solids, sulphate, Biochemical Oxygen Demand (leachate only), Chemical Oxygen Demand, Dissolved Organic Carbon, manganese Field Parameters: pH, conductivity	semi-annual basis (spring and fall)
Extended Suite Monitoring	water level, alkalinity, ammonia, arsenic,	semi-annual basis (spring

Wells: TW-1-2, TW-2-2, TW-3-2, TW-4-2, TW-5-2, TW-10-2, TW-11-2	barium, boron, cadmium, chloride, chromium, conductivity, copper, iron, lead, mercury, nitrate, nitrite, TKN, pH, total phosphorus, suspended solids (leachate only), Total Dissolved Solids, sulphate, zinc, Biochemical Oxygen Demand (leachate only), Chemical Oxygen Demand, Phenol, manganese Field Parameters: temperature, pH, conductivity, Dissolved Oxygen, flow	and fall)
TW-6-2, TW-7-2, TW-8-2, TW-9-2,	water level, alkalinity, ammonia, arsenic, barium, boron, cadmium, calcium, chloride, chromium, conductivity, copper, iron, lead, magnesium, manganese, mercury, nitrate, nitrite, TKN, pH, total phosphorus, potassium, sodium, suspended solids (leachate only), Total Dissolved Solids, sulphate, zinc, benzene, 1,4 dichlorobenzene, dichloromethane, toluene, vinyl chloride, Biochemical Oxygen Demand (leachate only), Chemical Oxygen Demand, dissolved oxygen carbon, Phenol Field Parameters: pH, conductivity	semi-annual basis (spring and fall)
VOC Monitoring Wells: TW2-2, TW6-2	In addition to the above noted parameters, these wells will also be analyzed for VOCs	semi-annual basis (spring and fall)

Surface Water Monitoring Program

Sampling Location	Parameters	Frequency
SW1, SW3, SW4, SW8	water level, alkalinity, ammonia, arsenic, barium, boron, cadmium, chloride, chromium, conductivity, copper, iron, lead, mercury, nitrate, nitrite, TKN, pH, total phosphorus, suspended solids (leachate only), Total Dissolved Solids, sulphate, zinc, Biochemical Oxygen Demand (leachate only), Chemical Oxygen Demand, Phenol, manganese Field Parameters: temperature, pH, conductivity, Dissolved Oxygen, flow	three times per year (spring run-off, low flow period and late fall flow period)

Landfill Gas Monitoring

Sampling Location	Parameters	Frequency
TW-1, TW-2, TW-3, TW-4, TW-5, GP-1, GP-2	methane	semi-annually concurrent with groundwater sampling

Schedule "C"

Trigger Mechanism and Contingency Plan

Tier I - "Alert"

If the downstream concentration of any of the defined trigger mechanism parameters exceeds the 75th percentile of the upstream results in a given sampling year, then the trigger is activated. If the exceedance occurs three sampling events in a row, then Tier II is activated.

Tier II - "Confirmation"

Sampling shall be conducted on a monthly basis for three (3) months. If the exceedance is confirmed, the *Owner* shall initiate discussion with the MOE to define the optimum course of remedial action with six (6) months of the activation of the Tier II trigger.

Tier II - "Compliance"

Implementation of the remedial actions as agreed upon with the MOECC.

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

GENERAL

- The reason for Conditions 1(1), (2), (4), (5), (6), (7), (8), (9), (10), (17), (18) and (19) is to clarify the legal rights and responsibilities of the *Owner* and *Operator* under this *Approval*.
- The reasons for Condition 1(3) are to ensure that the *Site* is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the *Owner*, and not in a manner which the *Director* has not been asked to consider.
- The reasons for Condition 1(11) are to ensure that the *Site* is operated under the corporate name which appears on the application form submitted for this *approval* and to ensure that the *Director* is informed of any changes.
- The reasons for Condition 1(12) are to restrict potential transfer or encumbrance of the *Site* without the approval of the *Director* and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this *Approval*.
- The reason for Condition 1(13) is to ensure that the successor is aware of its legal responsibilities.
- The reasons for Condition 1(14) and (15) are that the Part II.1 *Director* is an individual with authority pursuant to Section 197 of the Environmental Protection Act to require registration on title and provide any person with an interest in property before dealing with the property in any way to give a copy of the *Approval* to any person who will acquire an interest in the property as a result of the dealing.
- The reason for Condition 1(16) is to ensure that appropriate Ministry staff has ready access to the *Site* for inspection of facilities, equipment, practices and operations required by the conditions in this *Approval*. This Condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the *Act*, the *OWRA*, the *PA*, the *NMA* and the *SDWA*.
- Condition 1 (20) has been included in order to clarify what information may be subject to the

SITE OPERATION

- The reasons for Conditions 2(1), 2(5) and 2(6) are to ensure that the *Site* is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.
- The reason for Conditions 2 (2), 2(3) and 2(4) is to ensure that users of the *Site* are fully aware of important information and restrictions related to *Site* operations and access under this *Approval*.
- The reasons for Condition 2(7) are open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance effects.
- The reasons for Condition 2(8) and 2(9) are to specify the hours of operation for the landfill site and a mechanism for amendment of the hours of operation, as required.
- The reasons for Condition 2(10) are to ensure that the *Site* is supervised by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person and to ensure the controlled access and integrity of the *Site* by preventing unauthorized access when the *Site* is closed and no site attendant is on duty.
- The reason for conditions 2(11) and 2 (12) is to ensure the *Site* is operated in a manner ensuring the public safety.

EMPLOYEE TRAINING

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

COMPLAINTS RESPONSE PROCEDURE

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

EMERGENCY RESPONSE

- Condition 5 is included to ensure that emergency situations are handled in a manner to minimize the likelihood of an adverse effect and to ensure public health and safety and environmental protection.

RECORD KEEPING AND REPORTING

- The reason for Conditions 6(1) and 6(2) is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this *Approval* (such as storage capacity, record keeping, annual reporting, and financial assurance requirements), the *EPA* and its regulations.
- The reasons for Conditions 6(3), 6(4), 6(5) and 6(6) are to ensure that routine Transfer Station inspections are completed, and that detailed records of Transfer Station inspections are recorded and maintained for inspection and information purposes.
- The reasons for Conditions 6(7) and 6(8) are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in

reviewing site activities and for determining the effectiveness of site design.

TRANSFER STATION DESIGN AND OPERATION

- The reason for Conditions 7(1) to 7(5) and 7 (7) is to specify the approved areas from which waste may be accepted at the *Site* and the types and amounts of waste that may be accepted at the *Site* for processing and transfer, based on the *Owner's* application and supporting documentation.
- The reason for Condition 7(6) is to specify the amount of waste and processed material that may be stored at the *Transfer Station*.
- The reason for Conditions 7(8) to 7(13) inclusive is to ensure that the *Transfer Station* is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.

LANDFILL MONITORING

- Condition 8 (1) is included to provide landfill gas limits to protect the health and safety of the public.
- Condition 8 (2) is included to provide groundwater and surface water limits to prevent water pollution at the *Site*.
- Reasons for Conditions 8(3), 8(4) and 8(5) are to ensure that off-site migration of landfill gas is monitored and all buildings at the *Site* are free of any landfill gas accumulation, which due to a methane gas component may be explosive and thus create a danger to any persons at the *Site*.
- Conditions 8(6) and 8(7) are included to require the *Owner* to demonstrate that the *Site* is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.
- Conditions 8(8), 8(9), 8(10) and 8(11) are included to ensure the integrity of the groundwater monitoring network so that accurate monitoring results are achieved and the natural environment is protected.
- Conditions 8(12) to 8(15) inclusive are added to ensure the *Owner* has a plan with an organized set of procedures for identifying and responding to potential issues relating to groundwater and surface water contamination at the *Site's* compliance point.
- Conditions 8(16), 8(17) and 8(18) are included to streamline the approval of the changes to the monitoring plan.

CLOSURE PLAN

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

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A340901 issued on September 11, 2003 and associated notices of amendment.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a

hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

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

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

The Notice should also include:

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

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

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the
purposes of Part II.1 of the
Environmental Protection Act
Ministry of the Environment and
Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

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

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

DATED AT TORONTO this 9th day of June, 2016

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

RM/

c: District Manager, MOECC Peterborough
Nyle McIlveen, The Corporation of the Township of Douro-Dummer



Appendix C

Correspondence

Fully accessible appended items are available upon request.



Stoney Lake Road Landfill
LOT:21, CONCESSION:4, GEOTOWNSHIP:DOURO, DOURO-DUMMER, ON,

Inspection Report

System Number: 4442-5LNQ29
Inspection Start Date: 12/11/2020
Inspection End Date: 04/28/2021
Inspected By: Sarah Bellamy
Badge #:

A rectangular box containing a handwritten signature in black ink, which appears to read "Sarah Bellamy".

(signature)

NON-COMPLIANCE/NON-CONFORMANCE ITEMS

The following item(s) have been identified as non-compliance/non-conformance, based on a "No" response captured for a legislative or best management practice (BMP) question (s), respectively.

Question Group: Operations

Question ID	1-DYPBQR	
Question	Question Type	Legislative Requirement
Is the site being operated in compliance with the site security, site access, and entrance/exit signage requirements in the ECA?	Legislative	EPA 186 (1),EPA 186 (3)
Observation/Corrective Action(s)		

Question ID	1-E16YBZ	
Question	Question Type	Legislative Requirement
Are the entrance and exit signs legible and displayed as specified in the ECA?	Legislative	EPA 186 (1),EPA 186 (3)
Observation/Corrective Action(s)		
<p>The entrance sign does not display the ECA Number, does not list prohibited waste types, and does not identify a 24 hour emergency telephone number to call, or a complaint reporting telephone number to call, as required by condition 2. (2) of ECA A340901.</p> <p>A telephone number for "Inquiries 705-652-3505" is listed, which is a telephone number for Waste Connections.</p> <p>Action: The Township must enhance the entrance sign to include the specified required information, and must provide a photograph of the revised sign to the Ministry, within 30 days of receipt of this Report.</p>		

Question Group: Operations Manuals

Question ID	1-E1CEWT	
Question	Question Type	Legislative Requirement
Is the operational plan complete with the required information and kept up to date?	Legislative	EPA 186 (1),EPA 186 (3)
Observation/Corrective Action(s)		
There is no indication that the Design, Operation and Maintenance Report has been updated since		

2014. A review of the Report indicates that several of the listed contacts are no longer appropriate.

Question ID	1-EICKMW	
Question	Question Type	Legislative Requirement
Is the operational plan readily available at the Site for inspection and for Site personnel?	Legislative	EPA 186 (1),EPA 186 (3)
Observation/Corrective Action(s)		
Waste Connections staff indicated that they had not received a copy of the Report from the previous Operator or from the Township.		

Question Group: Other Inspection Findings

Question ID	949100	
Question	Question Type	Legislative Requirement
Were the inspection questions sufficient to address other identified non-compliance items?	Legislative	Not Applicable
Observation/Corrective Action(s)		
<p>The items identified herein are not specifically non-compliance.</p> <p>Additional Observations:</p> <p>It was noted that the waste storage bins for metals, at the rear of the site, were overflowing. Metals separated from mixed waste for recycling should be contained within bins or within a bunker on a concrete pad.</p> <p>It was noted that the on site fuel tank was located at the top of a hill, was precariously supported in place with rocks, and was sitting on dirt. It is acknowledged that this is a fuel tank, but I feel I must highlight this situation and recommend improvements be made, to avoid contamination or a spill, requiring clean up measures.</p>		

Question Group: Records / Reports

Question ID	1-DYPBPC	
Question	Question Type	Legislative Requirement
Was the ministry notified of any changes in ownership, operator, or address, as required?	Legislative	EPA 186 (1),EPA 186 (3)
Observation/Corrective Action(s)		
During 2018 Waste Connections became the site Operator, replacing M & M Disposal Service (1017492 Ontario Limited).		

A notification for the change in Operator, as required by section 1.(11) of Environmental Compliance Approval (ECA) A340901, issued to The Corporation of the Township of Douro-Dummer on June 9, 2016, has not been located in Ministry files.

Action:

The Corporation of the Township of Douro-Dummer (the Township) must resubmit any previous Notification made regarding the change of Operator for the Site.

OR

The Township must notify the Director in writing, and forward a copy of the notification to the District Manager.

The written notification must be provided by the Township within 30 days of receipt of this Report.

INSPECTION DETAILS

This section includes all questions that were assessed during the inspection.

Ministry Program: Regulated Activity: WASTE : Receiver Transfer Processing

Question ID	1-DYPBP3	
Question	Question Type	Legislative Requirement
Has there been any changes in ownership, operator, or address?	Information	Not Applicable
Observation		
<p>The "Operator" of the Transfer - Processing component of this Site has changed.</p> <p>According to the "2018 Operational Report," received on March 29, 2019, Waste Connections operated the site for the second half of the year. The previous Operator was M & M Disposal Service.</p>		

Question ID	1-DYPBPC	
Question	Question Type	Legislative Requirement
Was the ministry notified of any changes in ownership, operator, or address, as required?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
<p>During 2018 Waste Connections became the site Operator, replacing M & M Disposal Service (1017492 Ontario Limited).</p> <p>A notification for the change in Operator, as required by section 1.(11) of Environmental Compliance Approval (ECA) A340901, issued to The Corporation of the Township of Douro-Dummer on June 9, 2016, has not been located in Ministry files.</p> <p>Action: The Corporation of the Township of Douro-Dummer (the Township) must resubmit any previous Notification made regarding the change of Operator for the Site.</p> <p>OR</p> <p>The Township must notify the Director in writing, and forward a copy of the notification to the District Manager.</p> <p>The written notification must be provided by the Township within 30 days of receipt of this Report.</p>		

Question ID	1-DYPBQR	
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Question	Question Type	Legislative Requirement
Is the site being operated in compliance with the site security, site access, and entrance/exit signage requirements in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		

Question ID	1-E1CEVU	
Question	Question Type	Legislative Requirement
Are routine site inspections conducted as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
<p>Waste Connections staff indicated that regular (weekly) inspections are performed, and a copy of an Inspection log sheet was provided. While the log sheet provided meets the information requirements of the log book (condition 6 (5)), there is no detail provided to indicate that the items listed for inspection in condition 6 (3) are actually being inspected.</p> <p>Listing individual items for inspection and providing direction regarding compliance, will assist site staff with performing a complete and accurate inspection, which will ensure areas of concern are promptly identified and remediated.</p> <p>Also, providing more detail on the Inspection log sheet will serve to demonstrate compliance with the requirements in ECA A340901.</p> <p>Action: The Township should work with the site Operator to create an Inspection log sheet that helps to ensure and maintain proper site operation, and submit a copy of the revised Inspection log sheet to the Ministry within 30 days of receipt of this Report.</p>		

Question ID	1-E1CEWD	
Question	Question Type	Legislative Requirement
Is the site complying with the approved service area requirements, as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
<p>The site is approved to receive waste from the county it is located in (Peterborough County) as well as the counties which surround Peterborough County (Haliburton, Hastings, Northumberland, and City of Kawartha Lakes/former Victoria County).</p> <p>It is unlikely that waste is transported to this site from beyond the listed service area, as such transport would not be cost or time effective.</p>		

Question ID	1-E1CEWL	
Question	Question Type	Legislative Requirement
Is the Site required by the ECA to have an Operational plan?	Information	Not Applicable
Observation		
The ECA A340901, condition 7(12), requires the site Design, Operation and Maintenance be in accordance with the documents in Schedule A, which lists the Stoney Lake Road Landfill Site Transfer Station Design, Operations and Maintenance Report dated May 2014.		

Question ID	1-E1CEWT	
Question	Question Type	Legislative Requirement
Is the operational plan complete with the required information and kept up to date?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
There is no indication that the Design, Operation and Maintenance Report has been updated since 2014. A review of the Report indicates that several of the listed contacts are no longer appropriate.		

Question ID	1-E1CKMW	
Question	Question Type	Legislative Requirement
Is the operational plan readily available at the Site for inspection and for Site personnel?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
Waste Connections staff indicated that they had not received a copy of the Report from the previous Operator or from the Township.		

Question ID	1-E1FX2L	
Question	Question Type	Legislative Requirement
Is the Site constructed in accordance with the site plan?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		

Question ID	1-E1FX38	
Question	Question Type	Legislative Requirement
Are there any changes to the Site requiring an application to amend the approval or notification to the ministry?	Information	Not Applicable
Observation		

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Question ID	1-E1GHI5	
Question	Question Type	Legislative Requirement
Are training requirements being met as specified by the ECA or any other supporting documents?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
Waste Connections staff indicated that staff receive general waste management training, site specific training and training for the use of site equipment.		

Question ID	1-E1GHID	
Question	Question Type	Legislative Requirement
Have training recordkeeping requirements been met as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
Waste Connections staff indicated that records of training provided to staff are maintained.		

Question ID	1-E1GHQN	
Question	Question Type	Legislative Requirement
Is the Site operated and maintained such that vermin, vectors, dust, litter, odour, noise and/or traffic do not create a nuisance?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
Waste Connections staff indicated that vectors, vermin, dust litter, odour noise and traffic are not a concern, or are managed to avoid creating a nuisance.		
A pest control company maintains rodent traps on site, birds and other animals are not populous, the driveway is swept to reduce dust, grinding only takes place between 8:00 am and 5:00 pm, equipment back up alarms are not needlessly loud, other equipment is fairly quiet, , odour is not a concern (waste is constantly moving off-site), and the site is somewhat remote.		

Question ID	1-E1GUWW	
Question	Question Type	Legislative Requirement
Does the Site require an Emergency Plan?	Information	Not Applicable
Observation		

Question ID	1-E1GZQG	
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Question	Question Type	Legislative Requirement
Has an Emergency Plan been developed?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		

Question ID	1-E1H1SB	Question	Question Type	Legislative Requirement
		Has the Emergency Plan been implemented?	Legislative	EPA 186 (1), EPA 186 (3)
Observation				
<p>A copy of the Emergency Response Plan was available on-site. A later (almost identical) version of the Emergency Response Plan is contained within the Design, Operation and Maintenance Report, dated May 2014, which must used as the official version.</p> <p>Action: The Township must review the Emergency Response Plan to ensure contact names and telephone numbers are up to date etc., and must provide a copy of the updated plan to the Ministry within 30 days of receipt of this Report.</p>				

Question ID	1-E1H5C2	Question	Question Type	Legislative Requirement
		Have site inspection recordkeeping requirements been met as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation				
<p>Site Inspection Records related to the Transfer/Processing operation are retained and meet the listed requirements.</p> <p>Site Inspection requirements listed for the closed landfill and related to site monitoring, were not reviewed as part of this inspection, which focused on the Transfer/Processing component of the site.</p>				

Question ID	1-E1H7XM	Question	Question Type	Legislative Requirement
		Have spill and emergency recordkeeping requirements been met as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation				
<p>Waste Connections staff indicated that they are not aware of any spills or emergency situations, but would ensure proper procedures and record keeping are in place.</p>				

Question ID	1-E1HGH0	
Question	Question Type	Legislative Requirement
Is an annual report required?	Information	Not Applicable
Observation		
<p>In addition to the Annual Report, the ECA requires that a written or electronic log be maintained which includes the date, the quantity and source of waste coming into the site, and the quantity and destination of waste leaving the site.</p> <p>An electronic log is maintained with dates, weights, and type of waste material coming in and leaving the site. Please ensure that the weight/quantity and destination for metals, cover material and processed (ground) wood (reportedly sent for fuel), is also recorded to the electronic log.</p> <p>Please also ensure that sufficient information is captured from the log, for inclusion in the Annual Report, to meet Annual Report Requirements.</p> <p>The Daily Record for November 16, 2020 was reviewed.</p> <p>The ECA also requires that a record be created of the total amount of waste on the site, at the end of each week. Mr. Joosse indicated that the waste quantity on site was assessed when Waste Connections began operating the site, and a tally of waste weight coming in, and going out of the site has been maintained ever since that time. It is used to report the weight of waste on site at the end of the day each Friday.</p> <p>Records for several weeks in November 2020 and January 2021 were provided for review. It was noted that the November record values did not match the spread sheet when they were calculated by this reviewer.</p> <p>Action: The Records for 2020 must be reviewed for accuracy and the source of the discrepancy identified. The findings of the review must be reported to the Ministry within 30 days of receipt of this Report.</p> <p>The January values and calculation appeared to be accurate. It is recommended that the accuracy of these records be verified periodically.</p>		

Question ID	1-E1HR34	
Question	Question Type	Legislative Requirement
Is there an ECA condition requiring financial assurance?	Information	Not Applicable
Observation		

Question ID	949100	
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Question	Question Type	Legislative Requirement
Were the inspection questions sufficient to address other identified non-compliance items?	Legislative	Not Applicable
Observation		
<p>The items identified herein are not specifically non-compliance.</p> <p>Additional Observations: It was noted that the waste storage bins for metals, at the rear of the site, were overflowing. Metals separated from mixed waste for recycling should be contained within bins or within a bunker on a concrete pad.</p> <p>It was noted that the on site fuel tank was located at the top of a hill, was precariously supported in place with rocks, and was sitting on dirt. It is acknowledged that this is a fuel tank, but I feel I must highlight this situation and recommend improvements be made, to avoid contamination or a spill, requiring clean up measures.</p>		

Question ID	1-E1HKEM	Question	Question Type	Legislative Requirement
		Was a copy of the annual report available or submitted to the ministry, as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation				
<p>An Annual Monitoring Report and an Annual Operational Report are submitted to the Ministry as required.</p> <p>Annual Reports must be submitted to the District Manager by March 31st of the year following the year being reported on.</p>				

Question ID	1-E1HNH3	Question	Question Type	Legislative Requirement
		Was the annual report complete with the required information, as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation				
<p>The 2018 Monitoring Report was not reviewed during this Inspection, as this Inspection is focussed on the Transfer/Processing Operation and not the closed landfill.</p> <p>A review of the 2018 Operational Report indicates that it meets the listed requirements, however the Township should obtain, and report, more detail about the source of incoming waste as well as the destination of outgoing residual waste for final disposal, small size waste for landfill cover, wood grindings for fuel, metal for recycling, and tires.</p> <p>It was noted that the 2018 Report indicates that C & D waste residuals are relocated to the north end of the site (and placed on bare ground) and are moved off site daily. Currently the C & D</p>				

residuals are relocated to the covered ICI receiving area and are transferred off site with other ICI wastes according to an appropriate timeline, as required by the ECA.

Also it was noted that the 2018 Report indicates that C & D waste is loaded into a sorting machine to separate out small sized waste (for landfill cover) and that residual waste is removed by hand at the picking station. At the time of the Inspection, site operations had been revised by the current operator, who is not sorting out small size cover material, and who is sorting waste and removing materials such as metal for recycling with the use of heavy equipment such as a backhoe and excavator.

The review of the 2018 Operational Report indicates that the currently formatted (and repeated) Annual Operations Report is in need of a review and up date, to ensure that the Annual Report is accurately reflecting current site operations.

Question ID	1-E16YBZ	
Question	Question Type	Legislative Requirement
Are the entrance and exit signs legible and displayed as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
<p>The entrance sign does not display the ECA Number, does not list prohibited waste types, and does not identify a 24 hour emergency telephone number to call, or a complaint reporting telephone number to call, as required by condition 2. (2) of ECA A340901.</p> <p>A telephone number for "Inquiries 705-652-3505" is listed, which is a telephone number for Waste Connections.</p> <p>Action: The Township must enhance the entrance sign to include the specified required information, and must provide a photograph of the revised sign to the Ministry, within 30 days of receipt of this Report.</p>		

Question ID	1-E16YC9	
Question	Question Type	Legislative Requirement
Is the site secure, as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		

Question ID	1-E16YDJ	
Question	Question Type	Legislative Requirement
Is the site access limited as specified in the ECA?	Legislative	EPA 186 (1),

		EPA 186 (3)
Observation		

Ministry Program: Regulated Activity: WASTE : Receiver Transfer Processing

Question ID	1-E2RB6B	
Question	Question Type	Legislative Requirement
Is the site only accepting wastes limited to the types specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3), EPA 27 (1), EPA 40
Observation		
<p>The site accepts Construction-Demolition waste which is sorted to remove wood, metal and other materials for recycling/reuse. The site may also sort small diameter waste pieces out for use as landfill cover. The residual waste is bulked and shipped off site.</p> <p>Metal is transferred to a metal recycler and wood is put through a grinder and shipped off site for use as fuel.</p> <p>The site accepts mixed waste from Industrial-Commercial-Institutional sources including apartment buildings. This waste is mostly received in bags. The waste is placed on a concrete pad with a roof structure overtop of it. Waste is bulked and shipped off site for disposal.</p>		

Question ID	1-E2TK4H	
Question	Question Type	Legislative Requirement
Is waste received at the Site within the approved limits as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3), EPA 27 (1), EPA 40
Observation		
<p>Daily Records reviewed for November 16, 2020 and weekly on-site waste totals for November 2020 and January 2021, were reviewed. The records indicated that the site is in compliance with quantity limits for incoming waste, outgoing waste, and the amount of waste on-site at any time, as indicated by the Friday waste tally.</p>		

Question ID	1-E2TK4P	
Question	Question Type	Legislative Requirement
Are wastes stored and handled in accordance with the ECA conditions?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
<p>During the inspection segregated metal waste was overflowing the storage roll off bin. Metal</p>		

wastes stored for transfer to a metal recycler, should be stored within waste bins or within a bunker with a concrete pad.

Question ID	1-E2TOAX	
Question	Question Type	Legislative Requirement
Are wastes processed in accordance with the ECA conditions?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
Wastes are sorted to remove metal, wood etc. for recycling or reuse. Wood is processed by grinding for use as fuel. Previously waste was processed to remove small pieces for landfill cover but such processing has not been undertaken recently. Residual waste is bulked into larger loads and shipped for disposal.		

Question ID	1-E2TOBP	
Question	Question Type	Legislative Requirement
Are waste areas of the site being inspected, as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
Inspections are taking place and deficiencies are noted. It was recommended during the inspection that the log sheet be enhanced to provide further direction regarding which areas need inspection and the standards to be met.		

Question ID	1-E2TOBY	
Question	Question Type	Legislative Requirement
Are trained/competent personnel inspecting the waste areas, as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
Staff receive general waste training, site specific waste training, and training on the use of equipment.		

Question ID	1-E2TOCQ	
Question	Question Type	Legislative Requirement
Is the site maintaining records on incoming, outgoing, and waste storage amounts, as specified in the ECA?	Legislative	EPA 186 (1), EPA 186 (3)
Observation		
Electronic log records are kept of waste coming in, going out, and on site total quantities of waste at the end of each week.		

Question ID	949100	
Question	Question Type	Legislative Requirement
Were the inspection questions sufficient to address other identified non-compliance items?	Legislative	Not Applicable
Observation		



Township of Douro-Dummer

894 South Street
PO Box 92
Warsaw ON K0L 3A0

www.dourodummer.on.ca

Administration Department

Elana Arthurs, CMO

Chief Administrative Officer
Ph 705-652-8392 Ext. 206
F 705-652-5044
elanaa@dourodummer.on.ca

June 24, 2021

Ministry of the Environment, Conservation and Parks
Attention: Environmental Compliance Approval, Director
Client Services and Permissions Branch
135 St. Clair Avenue West, 1st Floor
Toronto Ontario
M4V 1P5

Via email - enviroperrmissions@ontario.ca

Re: Stoney Lake Road Landfill – Inspection Report

In response to the inspection completed by Sarah Bellamy at the Stoney Lake Road Landfill site, please see our comments to the observations and corrective actions required.

Question ID – 1-E16YBZ

Please see the photograph attached of the entrance sign to include the specified required information.

Question ID – 1-E1CEWT

The Design, Operation and Maintenance Report has not been updated since 2014. The following changes shall be made.

3.2 Waste Quantities - M&M Disposal should read Waste Connections of Canada

4.3.2. Facility Management - M&M Disposal should read Waste Connections of Canada

Emergency Response Plan

1.0 Introduction - M&M Disposal should read Waste Connections of Canada

2.0 Emergency Response Numbers - Dave Clifford, CAO should read Elana Arthurs, CAO

2.1 Assessing Emergencies – Mr. Mike Mundell should read Mr. Adrian Joosse (Waste Connections of Canada) 705-742-4268

Question ID – 1-E1CKMW – The Township has supplied the Waste Connections Staff with a copy of the Township of Douro-Dummer Stoney Lake Road Landfill Site Transfer Station Design, Operations and Maintenance Report Geo-Logic Inc. Project No. G024824 E1 dated May 2014 as well as the Ministry of the Environment and Climate Change Amended Environmental Compliance Approval Number A340901 Issued Date: June 9, 2016

Question ID – 1-E1CEVU – The Operator has provided an Inspection log sheet to ensure and maintain proper site operation. A copy has been attached to this letter.

Question ID 949100 – The overflowing bins of scrap metal have been cleaned up and the scrap metal has been sent to a recycler.

The fuel tank was checked and is a double walled tank. The spot it was sitting on was graded with gravel and has been protected with cement barriers to avoid it being hit. As well, the

backside has been protected with concrete blocks to avoid it being able to be bumped down the hill. The base has concrete blocks buried in the gravel to support the tank.
(Pictures are attached)

Question ID 1-DYPBPC – The Township has provided notification to the Director in writing, and forwarded a copy to the District Manager of the change in ownership and supporting documents.

Question 1-E1H1SB – The Township has updated the information as follows:

1.0 Introduction - M&M Disposal should read Waste Connections of Canada

2.0 Emergency Response Numbers - Dave Clifford, CAO should read Elana Arthurs, CAO

2.1 Assessing Emergencies – Mr. Mike Mundell should read Mr. Adrian Joosse (Waste Connections of Canada) 705-742-4268

This information has been provided to the Contractor as the official version of the Emergency Response Plan.

Question 1-E1HGH0 – The Contractor has indicated a review of their previous tracking sheets which were reviewed by the Ministry for 2020 showed that there was a slight discrepancy possible between months depending on when loads that were loaded at the site were delivered to the landfill. For example, a load may have been loaded onto a truck on a Friday at the end of the month for delivery to the landfill on Monday which would have been a new month and week.

In April, 2021 a new scale was installed at the site. This is a full length truck scale that allows a much more accurate weight of transport trucks coming in and leaving the site. Historically they used to “split weigh” transport trucks and then wait for confirmation on the weights from the final landfill destination. There was always a slight variance due to the split weighing. With the new scale, outbound tonnes are recorded as they leave the site and split weigh trucks are no longer used. The recorded weight and the delivered weight are very close so they rely on weight tickets. This eliminates the need to wait for final outbound tonnes from a landfill. Also, they have switched to a weekly tracker in an Excel format rather than subtotals for each week from a monthly tracker. There were some issues realized as they turned over a new month that did not necessarily end on a Friday. The new tracker only looks at Monday to Friday tonnes and does not care about the months turning over.

Question 1-E2TK4P - The scrap bunker has been set up on the C&D pad and scrap is now stored in these bunkers with concrete slab floors and walls until a load is ready to ship to the scrap recycler. (Pictures are attached)

Sincerely,

Elana Arthurs

Elana Arthurs, CMO
C.A.O.











**Disposal of the following
items is prohibited:**

Hazardous Waste, Oils & Solvents,
Batteries, Electronics, Pesticides, Liquid
Waste, Paint, Medical/Infectious Waste,
Septic/Sewage, Fluorescent Light Bulbs,
Tires, Explosives, Vehicles/Boats.

Environmental Compliance Number - A340901
Emergency Number 705-872-2467 | Complaint Number 705-742-4268

Transfer Station Inspection

Facility:	Stoney Lake Road Landfill	Permit NO:	A340901
Address:	Lot 21, Concession 4 Douro-Dummer Township	Date:	
Inspector(s):		Time:	

Site conditions

Recommended Action

	<i>Site conditions</i>	<i>Recommended Action</i>
Roadway:		
Entrance:		
Tent:		
C&D:		
Perimeter:		



Township of Douro-Dummer

894 South Street
PO Box 92
Warsaw ON K0L 3A0

www.dourodummer.on.ca

Administration Department

Elana Arthurs, CMO

Chief Administrative Officer
Ph 705-652-8392 Ext. 206
F 705-652-5044
elanaa@dourodummer.on.ca

June 24, 2021

Ministry of the Environment, Conservation and Parks
Attention: Environmental Compliance Approval, Director
Client Services and Permissions Branch
135 St. Clair Avenue West, 1st Floor
Toronto Ontario, M4V 1P5

Via Email – enviopermissions@ontario.ca

Re: Stoney Lake Road Landfill – Change in Operator Notification

In response to the Inspection Report conducted at the Stoney Lake Road Landfill Site:

System Number:	4442-5LNQ29
Inspection Start Date:	12/11/2020
Inspection End Date:	04/28/2021
Inspected By:	Sarah Bellamy

Question ID 1-DYPBPC

Was the ministry notified of any changes in ownership, operator, or address, as required?

I have not been able to locate a letter from the Township of Douro-Dummer to the Director or the District Manager within 30 days providing notice of the change to the Operator of the Site.

Effective September 4, 2018, the Operator of the Stoney Lake Road Landfill site located in, and owned by, the Township of Douro-Dummer was transferred from M & M Recyclers Inc. to

Waste Connections of Canada
610 Applewood Cres., 2nd Floor
Vaughan, ON L4K 0E3

I have included the previous agreement and the amended agreement along with the Township By-law to this effect.

I trust this serves as the required notice, although if there is anything additional, please contact me directly.

Sincerely,

Elana Arthurs

Elana Arthurs, CMO
C.A.O.

CORPORATION OF THE TOWNSHIP OF DOURO-DUMMER

BY-LAW NUMBER 2007-40

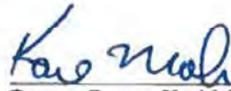
**Being a By-law to authorize the execution of a Lease
with
M & M Recyclers Inc.
(Lease of former Stoney Lake Road Landfill property
Lot 21, Concession 4, Douro Ward)**

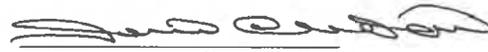
Whereas the Corporation of the Township of Douro-Dummer deems it expedient and necessary to enter into a Lease with the M & M Recyclers Inc.;

Now Therefore the Council of the Corporation of the Township of Douro-Dummer enacts as follows:

1. That the Corporation of the Township of Douro-Dummer enter into that certain Lease in writing attached hereto as Appendix 'A' and forming part of this by-law, between the Corporation of the Township of Douro-Dummer, and M & M Recyclers Inc. upon and subject to the terms and conditions therein stated.
2. That the Reeve and the Clerk be and are hereby authorized and directed to execute that certain Lease and affix the Corporate Seal thereto.
3. That any by-laws or parts thereof that conflict with this by-law be hereby repealed.

Passed in open council this 5th day of June, 2007


Deputy Reeve, Karl Moher


C.A.O., David Clifford

THIS LEASE made the 28th day of May, 2007.

IN PURSUANCE OF THE *SHORT FORMS OF LEASES ACT*
AND THE COMMERCIAL TENANCY ACT, R.S.O. 1990 c. L7
(formerly *The Landlord and Tenant Act*)

B E T W E E N :

THE CORPORATION OF THE TOWNSHIP OF DOURO-DUMMER,
hereinafter called the "Landlord"

A N D

OF THE FIRST PART

M & M RECYCLERS INC.

hereinafter called the "Tenant"

OF THE SECOND PART

AND

MICHAEL MUNDELL

Hereinafter called the "Indemnifier or Guarantor"

OF THE THIRD PART

IN CONSIDERATION of the rents reserved and the covenants and agreements herein on the part of the Tenant, the Landlord leases to the Tenant the premises (the "Premises") in the geographic Township of Douro, situated in the Township of Douro-Dummer, Province of Ontario as more particularly described in Schedule AA@ annexed hereto.

1. Term

To hold the Premises for the term (the "Term"), of ten (10) years to be computed from the 1st day of June, 2007, and fully to be complete on the 31st day of May, 2017.

2. Rent

The Tenant paying therefor during the term to the Landlord at its offices, 894 South Street, Warsaw, Ontario K0L 3A0 or at the place that the landlord may hereinafter designate, the following rental. The first payment is to be made on the 1st day of June, 2007.

Year One	\$1.00 per tonne for material received at the site with a minimum monthly payment of \$500.00 plus GST
Year Two	\$1.30 per tonne for material received at the site with a minimum monthly payment of \$650.00 plus GST
Year Three	\$1.65 per tonne for material received at the site with a minimum monthly payment of \$825.00 plus GST
Year Four	\$1.70 per tonne for material received at the site with a minimum monthly payment of \$850.00 plus GST
Year Five	\$1.75 per tonne for material received at the site with a minimum monthly payment of \$876.00 plus GST
Year Six	\$1.80 per tonne for material received at the site with a minimum monthly payment of \$903.00 plus GST
Year Seven	\$1.86 per tonne for material received at the site with a minimum monthly payment of \$931.00 plus GST
Year Eight	\$1.91 per tonne for material received at the site with a minimum monthly payment of \$959.00 plus GST

Year Nine	\$1.97 per tonne for material received at the site with a minimum monthly payment of \$988.00 plus GST
Year Ten	\$2.03 per tonne for material received at the site with a minimum monthly payment of \$1,017.64

The minimum monthly rental shall be paid on the 1st day of each and every month throughout the term of the lease. Each and every three months throughout the term of the lease, the tenant shall file a report with the Clerk setting out the weight of all material received during the previous three months and shall provide payment where applicable, in those cases where the rental calculated per ton exceeds the minimum monthly rental heretofore paid.

3. Tax adjustment

(1) In this paragraph:

- (a) "Tax" means all taxes, rates, duties and assessments whether municipal, provincial, federal or otherwise, charged upon the demised premises or upon the Landlord on account thereof including municipal taxes for local improvements.

4. Recovery of adjustments

The Landlord has the same rights and remedies in the event of default by the Tenant in payment of an amount payable by him pursuant to paragraph 3, as the Landlord has in the case of default in payment of rent.

5. Tenant's covenants

The Tenant and the indemnifiers/guarantors covenant with the Landlord:

- (1) Rent -- to pay rent;
- (2) Utility charges -- to pay any and all utility charges;
- (3) Business and school taxes -- to pay business and other taxes, charges, rates, duties and assessments levied in respect of the Tenant's occupancy of the Premises or in respect of the personal property or business of the Tenant on the Premises as and when they become due; if the Tenant or any assignee or subtenant of the Tenant elects to have the Premises or any part thereof assessed for separate school taxes, the Tenant shall pay to the Landlord, as soon as the amount of the separate school taxes is ascertained, the amount by which the separate school taxes exceed the amount which would have been payable for school taxes had such election not been made;
- (4) Repair -- to repair, reasonable wear and tear and damage by fire, lightning and tempest only excepted; and to permit the Landlord to enter and view the state of repair and to repair according to notice in writing, reasonable wear and tear and damage by fire, lightning and tempest only excepted; and to leave the Premises in good repair, reasonable wear and tear and damage by fire, lightning and tempest excepted;
- (5) Cost of repair where Tenant at fault -- that if the Premises become damaged or destroyed through the negligence, carelessness or misuse of the Tenant, or anyone permitted by him to be on the Premises, the expense of any necessary repairs, replacements or alterations shall be paid by the Tenant to the Landlord forthwith on demand;
- (6) Assigning or subletting -- not to assign, sublet or part with possession of any part of the Premises without the consent in writing of the Landlord.
- (7) Rules and regulations -- that the Tenant and his employees and all persons visiting or doing business with them on the Premises are bound by and will observe and perform the rules and regulations made from time to time by the Landlord of which notice in writing shall be given to the Tenant and that all such rules and regulations are deemed to be incorporated in and form part of this lease;

- (8) Use of Premises and insurance -- (a) not to use the Premises except for the purposes of a licenced transfer station for which a certificate of approval has issued from the Ministry of the Environment wherein a transfer station is a facility for accepting only solid non-hazardous waste limited to construction and demolition debris and not to carry on or permit to be carried on therein any other trade or business; (b) not to do, omit, or permit any activity upon the Premises which causes the rate of insurance to be increased; (c) if the rate of insurance is increased by the use made of the Premises or by anything done, omitted or permitted by the Tenant or by anyone permitted by the Tenant to be upon the Premises, the Tenant shall pay to the Landlord the amount of the increase; (d) if any insurance policy is canceled by the insurer because of the use of the Premises by the Tenant or by any assignee or subtenant of the Tenant or by anyone permitted by the Tenant to be upon the Premises the Landlord may at its option determine this lease forthwith by leaving upon the Premises notice in writing of its intention to terminate and thereupon rent and any other payments for which the Tenant is liable under this lease shall be apportioned and paid in full to the date of determination and the Tenant shall immediately deliver up possession of the Premises to the Landlord and the Landlord may re-enter and repossess them;
- (9) Observance of law -- in his use and occupation of the Premises, not to violate any law or ordinance or any order, rule, regulation or requirement of any federal, provincial or municipal government or any department, commission, board or officer thereof;
- (10) Waste and nuisance -- not to do or suffer any waste or damage, disfiguration or injury to the Premises or the fixtures and equipment therein; and not to use or permit the use of any part of the Premises for any dangerous, noxious or offensive trade or business and not to cause or maintain any nuisance on the Premises;
- (11) Entry by Landlord -- to permit the Landlord or its agents to enter upon the Premises at any time and from time to time for the purpose of inspecting and of making repairs, alterations or improvements to the Premises, and the Tenant is not entitled to compensation for any inconvenience, nuisance or discomfort occasioned thereby;
- (12) Indemnity -- to indemnify the Landlord against all claims by any person, firm, or corporation arising from the conduct of work by or through any act of negligence of the Tenant or any assignee, subtenant, agent, contractor, servant, employee or licensee of the Tenant, and against all costs, counsel fees, expenses and liabilities incurred in any claim or action or proceeding brought thereon;
- (13) Exhibiting Premises -- to permit the Landlord or its agents to exhibit the Premises to prospective tenants at a mutually agreeable time or times during the last twelve months of the Term;
- (14) Alterations, etc. -- not to make or erect in or to the Premises any installation, alteration, addition, or partition without submitting plans and specifications to the Landlord and obtaining the Landlord's prior written consent; the work shall if the Landlord so elects be performed by employees of or contractors designated by the Landlord; in the absence of the election, the work may be performed with the Landlord's consent in writing by contractors engaged by the Tenant but in each case only under written contract approved in writing by the Landlord and subject to all conditions which the Landlord may impose; the Tenant shall submit to the Landlord's supervision over construction and promptly pay to the Landlord or the Tenant's contractors, when due the cost of all work and of all materials, labour and services involved therein and of all decoration and all changes in the Premises, its equipment or services, necessitated thereby;
- (15) Signs -- not to paint, display, inscribe or affix any sign, picture, advertisement, notice, lettering or direction on any part of the Premises; save

- and except for an identification sign the colour, size, style, character and material of the same shall be as the Landlord determines .
- (16) Name of Building -- not applicable.
 - (17) Janitor service -- not applicable.
 - (18) Sidewalks and Parking Lot -- to keep both the sidewalks and the parking lot about the premises clear of snow and ice and of all other obstructions.
 - (19) Liability Insurance --
 - (1) at its sole cost and expense, take out and maintain in full force and effect, at all times throughout the Term, the following insurance:
 - (a) fire and extended perils under a standard extended form of fire insurance policy, in such amounts and on such terms and conditions as would be carried by a prudent owner of a similar project, having regard to the size, age and location of the project on the Lands, and such insurance shall add the Landlord as an additional insured, with coverage to the full insurable value thereof at all times (to be computed upon a replacement cost basis with deduction only of the cost of excavation and foundations);
 - (b) general liability and property damage insurance, including personal liability, contractual liability, tenants' legal liability, non-owned automobile liability and owners' and contractors' protective insurance coverage with respect to the Lands, written on a comprehensive basis with inclusive limits of at least ten million dollars (\$10,000,000.00) on an annual aggregate basis with an incident limit of five million dollars (\$5,000,000.00) with the Township as a named insured for each occurrence, or such higher limit as the Landlord, acting reasonably, or any Mortgagee requires from time to time;
 - (c) INTENTIONALLY DELETED; and
 - (d) any other form of insurance with whatever limits the Tenant, the Landlord, acting as a prudent owner, or any Mortgagee reasonably requires from time to time, in such form and amounts and for risks against which a prudent tenant under similar circumstances would insure.
 - (2) All public liability insurance shall contain a provision for cross liability or severability of interest as between the Landlord and the Tenant. All the foregoing property policies shall contain a waiver of any right of subrogation or recourse by the Tenant's insurers against the Landlord or its contractors, agents and employees, whether or not any loss is caused by the act, omission or negligence of the Landlord, its contractors, agents or employees. The Tenant shall obtain, from the insurers, undertakings to notify the Landlord in writing at least thirty (30) days prior to any cancellation thereof. The Tenant shall furnish to the Landlord, upon written request, certificates of all such policies. The Tenant agrees that if the Tenant fails to take out or to keep in force such insurance or provide a certificate of every policy and evidence of continuation of coverage as herein provided, the Landlord shall have the right to take out such insurance and to pay the premium thereof and, in such event, the Tenant shall pay to the Landlord the amount paid as premium plus fifteen percent (15%), which payment shall be deemed to be Additional Rent payable on the first day of the next month following the said payment by the Landlord.

6. Landlord's covenants

The Landlord covenants with the Tenant:

- (1) Quiet enjoyment -- for quiet enjoyment;

7. Provisos

Provided always and it is agreed as follows:

- (1) **Fixtures.** The Tenant may remove his fixtures.

- (2) **Fire.** In case of damage to the Premises by fire, lightning or tempest, rent ceases until the Premises are rebuilt; and the Landlord, instead of rebuilding or making the Premises fit for the purpose of the Tenant, may at its option determine this lease on giving to the Tenant within thirty days after the damage notice in writing and thereupon rent and all other payments for which the Tenant is liable shall be apportioned and paid to the date of the damage and the Tenant shall immediately deliver up possession of the Premises to the Landlord.
- (3) **Damage to property.** The Landlord is not liable nor responsible in any way for any loss of or damage or injury to any property belonging to the Tenant or to its employees or to any other person while the property is on the Premises or in the yard unless the loss, damage or injury is caused by the negligence of the Landlord or of its employees, servants or agents and the Landlord is not liable in any event for damage to the property caused by steam, water, rain or snow from any other place or quarter nor for any damage caused by or attributable to the condition or arrangement of any electric or other wiring nor for any damage caused by anything done or omitted by any other Tenant.
- (4) **Impossibility of performance.** It is agreed that whenever the Landlord is unable to fulfill, or is delayed or restricted in fulfilling any obligation hereunder for the supply or provision of any service or utility or the doing of any work or the making of any repairs because it is unable to obtain the material, goods, equipment, service, utility or labour required to enable it to fulfill the obligation or by reason of any statute, law or order-in-council or any regulation or order passed or made pursuant thereto or by reason of the order or direction of any administrator, controller or board, or of any government department or officer or other authority, or by reason of not being able to obtain any permission or authority required thereby, or by reason of any other cause beyond its control, the Landlord is relieved from the fulfillment of the obligation and the Tenant is not entitled to compensation for any inconvenience, nuisance or discomfort thereby occasioned.
- (5) **Default of Tenant.** If the rent is not paid when due, whether lawfully demanded or not, or in case of breach or non-observance or non-performance of any of the covenants or agreements or rules or regulations herein contained or referred to on the part of the Tenant to be observed and performed, or in case the Premises are vacated or remain unoccupied or in case the Term is taken in execution or attachment for any cause, then the Landlord is entitled to enter upon the Premises or any part thereof in the name of the whole and to repossess and enjoy the Premises as of its former estate.
- (6) **Bankruptcy of Tenant.** In the event, without the written consent of the Landlord, the Premises remain vacant or not used for the period of fifteen days or are used by a person other than the Tenant or for any other purpose than that for which they were let or in case the Term or any of the goods and chattels of the Tenant are seized in execution or attachment by a creditor of the Tenant or if the Tenant makes any assignment for the benefit of creditors or any bulk sale or becomes bankrupt or insolvent or takes the benefit of any act for bankrupt or insolvent debtors, then this lease shall at the option of the Landlord cease and the Term shall immediately be forfeited and the current month's rent and the next ensuing three months' rent shall immediately become due and payable and the Landlord may re-enter and take possession of the Premises as though the Tenant or other occupant of the Premises was holding over after the expiration of the Term.
- (7) **Distress.** The Tenant waives the benefit of any present or future statute taking away or limiting the Landlord's right of distress, and agrees that none of the goods and chattels of the Tenant on the Premises at any time during the Term is exempt from levy by distress for rent in arrears.
- (8) **Right of re-entry.** On the Landlord's becoming entitled to re-enter the Premises under any of the provisions of this lease, the Landlord, in addition to all other rights, may do so as

the agent of the Tenant, using force if necessary, without being liable for prosecution therefor, and may relet the Premises as agent of the Tenant, and receive the rent therefor, and as agent of the Tenant may take possession of furniture or other property on the Premises and sell it at public or private sale without notice and apply the proceeds of sale and rent derived from reletting the Premises upon account of the rent under this lease, and the Tenant is liable to the Landlord for any deficiency.

- (9) **Right of termination.** On the Landlord's becoming entitled to re-enter the Premises under any of the provisions of this lease, the Landlord, in addition to all other rights, has the right to determine this lease forthwith by leaving upon the Premises notice in writing of its intention, and thereupon rent and any other payments for which the Tenant is liable under this lease shall be computed, apportioned and paid in full to the date of such determination, and the Tenant shall immediately deliver up possession of the Premises to the Landlord, and the Landlord may re-enter and repossess the Premises.
- (10) **Non-waiver.** Any condoning, excusing or overlooking by the Landlord of any default, breach or non-observance by the Tenant of any covenant, proviso or condition herein contained does not operate as a waiver of the Landlord's rights hereunder in respect of subsequent defaults, breaches or non-observances and does not defeat or affect in any way the rights of the Landlord herein in respect of any subsequent defaults or breaches.
- (11) **Overholding.** If the Tenant continues to occupy the Premises after the expiration of this lease with or without the consent of the Landlord, and without any further written agreement, the Tenant shall be a monthly tenant at the rent and on the terms and conditions herein set out except as to length of tenancy.
- (12) **Notice.** Any notice required by this lease is deemed sufficiently given if contained in writing enclosed in a sealed envelope addressed, in the case of notice to the Landlord, to it at The Corporation of the Township of Douro-Dummer, 894 South Street, P.O. Box 92, Warsaw, Ontario K0L 3A0 and in the case of notice to the Tenant, at 1017492 Ontario Limited c/o as M & M Disposal Service, 1513 County Road #4, Warsaw, Ontario K0L 3A0, attention: Michael and Gary Mundell, and deposited in one of Her Majesty's post offices in registered and postage prepaid. The date of receipt of the notice shall be deemed to be on the 5th day after mailing thereof. Provided that either party may, by notice to the other, designate another address in Canada to which notices mailed or delivered more than ten days thereafter shall be addressed.
- (13) **Right of First Refusal.** In the event that the Landlord wishes to sell the demised Premises, it shall firstly offer same to the Tenant by notice in writing at the appraised value therefor. The Tenant shall have ten (10) days following receipt of the notice of the Landlord's intention to sell to deliver to the Landlord notice of its intention to purchase upon the terms set forth in the Landlord's notice with closing to take place thirty (30) days thereafter. In the event that the Tenant refuses or neglects to accept the Landlord's offer to sell as aforesaid, the Landlord shall be at liberty to sell the subject premises to a third party without further notice to the Tenant, notwithstanding the Tenant's option to purchase set out below which shall come to an end if the Landlord exercises its right of first refusal herein. It is acknowledged that the transfer of the property from the Landlord to the Tenant must follow the Landlord's policies for the disposition of real property as may be in full force and effect at the time.
- (14) **Option to Purchase.** Provided that the Tenant is not in default under this lease, the Tenant shall have a one time option to purchase (the purchase option) the Premises as follows:
- (i) the Purchase Option shall be open for exercise by the Tenant throughout the term of the within lease;
 - (ii) the purchase price shall be the fair market value of the Premises, payable by certified cheque on closing. If the Landlord and Tenant do not agree on such fair market value at least thirty (30) days prior to closing, then the fair market value shall be determined by each of the

Landlord and Tenant obtaining an appraisal prepared by a qualified Accredited Appraiser of the Canadian Institute (AACI) with the purchase price being an average of the two appraisals.

Each party shall retain a qualified appraiser within five (5) days it being determined that an appraisal is required as the parties were unable to agree upon the fair market value. In the event that the appraisers have not make a determination by the date scheduled for closing, then closing shall be extended to five (5) business days following the determination of the fair market value.

(iii) the Tenant shall exercise the Purchase Option by written notice to the Landlord of its election to do so within the Purchase Option Period. Such notice to be accompanied by a deposit in the amount of Ten Thousand Dollars (\$10,000.00) payable to the Landlord. The notice from the Tenant exercising the Purchase Option shall constitute a binding agreement of purchase and sale;

(iv) the closing of the Purchase Option shall be on the thirtieth day following the exercise of the Purchase Option, unless such date is not a business day, in which case the closing shall be on the next business day;

(v) the Purchase Option shall be null and void and of no further force or effect if not exercised within the Purchase Option Period; and

(vi) the terms of a standard Ontario real estate association agreement of purchase and sale form in effect at the time that the Purchase Option is exercised shall apply to the Purchase Option, to the extent applicable and where not inconsistent with the terms hereof.

It is acknowledged that the transfer of the property from the Landlord to the Tenant must follow the Landlord's policies for the disposition of real property as may be in full force and effect at the time.

- (15) **GST** shall be in addition to the rental set out herein.
- (16) **Security.** To provide the Landlord sufficient security to ensure compliance with the Certificate of approval for the use of the property as a construction waste recycling transfer station and to further insure compliance with any existing certificate of approval, the Tenant shall maintain an irrevocable letter of credit in favour of the Landlord in the amount of Fifty Thousand Dollars (\$50,000.00) throughout the term of the within lease and for a period of One (1) year thereafter. The letter of credit shall issue from a Schedule 1 Chartered Canadian Bank.
- (17) **Traffic Study.** The Tenant covenants and agrees that it shall cause a traffic study to be completed by a recognized traffic engineer. It is understood and agreed that any recommendations made at the conclusion of the traffic study, such as entrance improvements, signage, etcetera, that may be necessary shall be completed at the cost of the Tenant.
- (18) **Certificate of Approval.** Prior to taking possession of the property, the Tenant covenants and agrees, at its expense, to obtain a certificate of approval from the Ministry of the Environment to utilize the property for a construction waste recycling transfer station. Any conditions imposed upon the Certificate by the Ministry of the Environment shall be implemented at the sole and only cost of the Tenant.
- (19) **Early Cancellation of Lease.** It is understood and agreed that either the Landlord or the Tenant may cancel the within lease upon providing six (6) months' written notice to the other as set out in Paragraph 7(12) of the within lease. It is agreed that the lease shall come to an end six (6) months after delivery of the aforesaid notice and the provisions herein for right of first refusal and option to purchase shall terminate on the date that the notice to terminate is delivered.
- (20) **Indemnity and Guarantee**

In consideration of the Landlord entering into this Lease with the Tenant, the Indemnifier, Michael Mundell, covenants and agrees to indemnify and save the Landlord

harmless against any and all liabilities, claims, damages, interest, penalties, fines, monetary sanctions, losses, costs and expenses whatsoever (including, without limitation, counsel and solicitor's fees on a substantial indemnity basis, reasonable costs of professional advisors, consultants and experts) arising from injury to property or injury to any person, firm, partnership or corporation, caused by the use, occupancy or presence of the Tenant or any other person, firm, partnership or corporation at, in, on or upon the lands.

8. Headings

The headings in this lease have been inserted as a matter of convenience and for reference only and in no way define, limit or enlarge the scope or meaning of this lease nor of any provisions hereof.

9. Effect of lease

This lease and everything herein contained shall extend to and bind and may be taken advantage of by the heirs, executors, administrators, successors and assigns, of each of the parties hereto, subject to the granting of consent by the Landlord to any assignment or sublease, and where there is more than one Tenant or there is a female party or a corporation, the provisions hereof shall be read with all grammatical changes thereby rendered necessary and all covenants are deemed joint and several.

WITNESS our hands and seals.

SIGNED, SEALED AND DELIVERED
in the presence of:



Gwendolyn
Gwendolyn



M & M RECYCLERS INC.

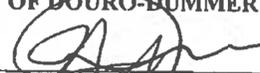
Per:

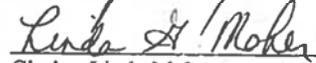

Michael Mundell, President

I have authority to bind the corporation.

THE CORPORATION OF THE
TOWNSHIP OF DOURO-BUMMER

Per:


Reeve - J. Murray Jones


Clerk - Linda Moher


Michael Mundell - Guarantor/Indemnifier

SCHEDULE AA@

Legal Description

Part of Lot 21, Concession 4, geographic Township of Douro, now in the Township of Douro-Dummer, County of Peterborough, Province of Ontario designated as Part 1 and Part 2 on Plan 45R-10681 and being all of PIN 28184-0162 (LT).

Corporation of the Township of Douro-Dummer

By-law Number 2013-27

**Being a By-law to authorize the execution of a Lease Agreement
with
M & M Disposal – 1017492 Ontario Ltd.
(Lease of former Stoney Lake Road Landfill property
Lot 21, Concession 4, Douro Ward)**

Whereas the Corporation of the Township of Douro-Dummer deems it expedient and necessary to enter into a Lease with M & M Disposal – 1017492 Ontario Ltd.;

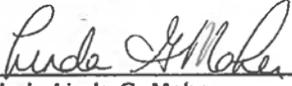
Now Therefore the Council of the Corporation of the Township of Douro-Dummer enacts as follows:

1. That the Corporation of the Township of Douro-Dummer enter into that certain Lease in writing attached hereto as Appendix 'A' and forming part of this by-law, between the Corporation of the Township of Douro-Dummer, and M & M Disposal – 1017492 Ontario Ltd. upon and subject to the terms and conditions therein stated.
2. That the Mayor and the Clerk be and are hereby authorized and directed to execute that certain Lease and affix the Corporate Seal thereto.
3. That any by-laws or parts thereof that conflict with this by-law be hereby repealed.

Passed in open council this 7th day of May, 2013



Mayor, J. Murray Jones



Clerk, Linda G. Moher

THIS AGREEMENT MADE IN DUPLICATE THIS 7th day of May, 2013.

BETWEEN:

THE CORPORATION OF THE TOWNSHIP OF DOURO-DUMMER,

hereinafter called the "Landlord"

OF THE FIRST PART

AND

M&M RECYCLERS INC.

hereinafter called the "Tenant"

OF THE SECOND PART

AND

MICHAEL MUNDELL

hereinafter called the "Indemnifier or Guarantor"

OF THE THIRD PART

AND

1017492 Ontario LTD.

hereinafter called the "Assignee"

OF THE FORTH PART

WHEREAS the Landlord, the Tenant, and the Indemnifier entered into a Lease for the premises more particularly described in "Schedule A" annexed hereto dated the 28th day of May 2007.

AND WHEREAS the parties desire to amend the terms of the Lease as set out within the Amending Agreement.

NOW THEREFORE in consideration of the sum of \$1.00 now paid by each party to the other the receipt and sufficiency whereof is hereby by each of them respectively acknowledged and in further consideration of the mutual provisos and covenants hereinafter set out, the parties hereto covenant and agree as follows:

1. Paragraph 1 of the Lease dated the 28th day of May, 2007, is amended to extend the term thereof for a further 5 years and shall now end on the 31st day of May 2022.
2. Paragraph 2 of the Lease dated the 28th day of May, 2007, is amended by adding thereto the rental that will be payable for years 11 through 15 of the lease as more particularly set out immediately below:

Year Eleven	\$2.06 per tonne for material received at the site with a minimum monthly payment of \$1,048.66 plus HST.
Year Twelve	\$2.12 per tonne for material received at the site with a minimum monthly payment of \$1,079.60 plus HST.
Year Thirteen	\$2.18 per tonne for material received at the site with a minimum monthly payment of \$1,111.98 plus HST.
Year Fourteen	\$2.25 per tonne for material received at the site with a minimum monthly payment of \$1,145.33 plus HST.
Year Fifteen	\$2.31 per tonne for material received at the site with a minimum monthly payment of \$1,179.68 plus HST.

3. The parties acknowledge that the current Lease references the subject property being utilized as a transfer station for accepting only solid non hazardous waste limited to construction and demolition debris. The parties further acknowledge that the Certificate of Approval for the subject property was amended on March 5th, 2013 to permit the subject lands to receive domestic type waste generated at ICI (industrial, commercial, institutional) facilities.

It is, therefore, understood and agreed that the reference in the Lease dated the 28th day of May 2007 to the property being utilized as a transfer station for solid non hazardous waste limited to construction and demolition debris shall now be

SCHEDULE A**Legal Description**

Part of Lot 21, Concession 4, geographic Township of Douro, now in the Township of Douro-Dummer, County of Peterborough, Province of Ontario designated as Part 1 and Part 2 on Plan 45R-10681 and being all of PIN 28184-0162(LT).

The Corporation of the Township of Douro-Dummer

By-law Number 2018-52

**Being a By-law to authorize the execution of a Lease Amending Agreement with Waste Connections of Canada Inc.
(Lease of Former Stoney Lake Road Landfill Property – Lot 21, Concession 4, Douro Ward)**

Whereas The Corporation of the Township of Douro-Dummer deems it expedient and necessary to enter into a Lease Amending Agreement for the Former Stoney Lake Road Landfill Property with Waste Connections of Canada Inc.;

Now Therefore the Council of The Corporation of the Township of Douro-Dummer enacts as follows:

1. That The Corporation of the Township of Douro-Dummer enter into that certain Lease Amending Agreement in writing attached hereto as Appendix 'A' and forming part of this by-law, between The Corporation of the Township of Douro-Dummer, and Waste Connections of Canada Inc.; upon and subject to the terms and conditions therein stated.
2. That Appendix 'A' of By-law No. 2013-27, is amended by the Lease Amending Agreement which is attached to this by-law as Appendix 'A'.
3. In all other respects By-law No. 2013-27, is hereby confirmed.
4. That the Mayor and the Clerk be hereby authorized to execute such Agreement and affix the Corporate Seal thereto.

Passed in Open Council this 4th day of September, 2018.



Mayor, J. Murray Jones



Deputy Clerk, Martina Chait-Hartwig

LEASE AMENDING AGREEMENT

This Agreement made as of ^{September} ~~August~~ ____, 2018 (the "Effective Date")

BETWEEN :

The Corporation of the Township of Douro-Dummer,

(hereinafter called the "Landlord")

OF THE FIRST PART

- and -

Waste Connections of Canada Inc.
(hereinafter called the "Successor Tenant")

OF THE SECOND PART

WHEREAS:

- A. By a lease dated May 28th, 2007, (as amended from time to time, the "Lease"), the Landlord, and M & M Recyclers Inc. (the "Original Tenant") entered into a lease with respect to the premises in the geographic Township of Douro, situated in the Township of Douro-Dummer, Province of Ontario as more particularly described in Schedule "A" attached hereto (the "Demised Premises"), for a term expiring May 31st, 2017 (the "Term");
- B. The Lease was extended for an additional period of five (5) years pursuant to a Lease Amending Agreement dated May 7th, 2013 (the "Extended Term");
- C. The Original Tenant through its successor corporation and the Successor Tenant executed an agreement wherein the Successor Tenant will acquire substantially all of the assets and interests of the Original Tenant and its successor corporation, 1017492 Ontario Limited; and
- D. The Landlord and Successor Tenant agree to amend the Lease as set out herein.

NOW THEREFORE in consideration of the mutual covenants and agreements herein contained and the sum of ONE DOLLAR (\$1.00) now paid by each of the parties to the other, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

- 1. The Landlord consents to the substitution of the Original Tenant for the Successor Tenant on the same terms and conditions contained in the Lease, except as specifically amended herein.
- 2. Paragraph 7(12) of the Lease is hereby amended to provide that address for service of the Landlord and Tenant are as follows:

To the Landlord at: The Corporation of the Township of Douro-Dummer
894 South Street, P.O. Box 92, Warsaw, ON K0L 3A0
Attention: David Clifford, CAO

To the Successor Tenant at: Waste Connections of Canada Inc.
610 Applewood Cres., 2nd Floor,
Vaughan, ON L4K 0E3
Attention: Legal Department

- 3. Paragraph 7(20) of the Lease is deleted in its entirety.
- 4. The parties acknowledge that the Successor Tenant is in possession of the Demised Premises and that the parties are not in material default of any of their obligations as set out in the Lease.
- 5. Except as modified by this Agreement, the terms, covenants, and conditions of the Lease shall remain unchanged and in full force and effect.
- 6. This Agreement shall enure to the benefit of and be binding upon the parties hereto and their respective heirs, executors, administrators, successors and assigns.
- 7. Time shall be of the essence.

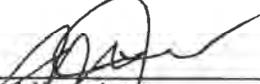
8. This Agreement may be signed in any number of counterparts, each of which is an original, and all of which taken together constitute one single document.

IN WITNESS WHEREOF the parties hereto have duly executed this Agreement as of the date first above written.

THE CORPORATION OF THE TOWNSHIP OF DOURO-DUMMER



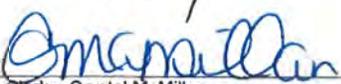
Witness



Mayor J. Murray Jones



Witness



Clerk - Crystal McMillan

We have authority to bind the corporation.

WASTE CONNECTIONS OF CANADA INC.

Per. _____
Name:
Title:

I have authority to bind the corporation.

SCHEDULE "A"

Legal Description:

Part of Lot 21, Concession 4, geographic Township of Douro, now Township of Douro-Dummer, County of Peterborough, Province of Ontario designated as Part 1 and Part 2 on Plan 45R10681 and being all of PIN 28184-0162 (LT).



Appendix D

Field Sheets and Climate Data

Fully accessible appended items are available upon request.



LOCATION: Stoney Lake WDS

DATE: June 28, 2021

WEATHER (SAMPLE DAY): 22°C Sun 29°C

PROJECT NUMBER: 12987-004

SAMPLED BY: N. Morin and M. Pion

WEATHER (PREVIOUS DAY): 28°C Rain

FIELD SHEET – GROUNDWATER DEVELOPMENT & SAMPLING

Sample Location	Water Level	B.H. Depth (m)	B.H. Dia. (mm)	Stick - Up (m)	Purge Volumes (L)		Temp (°C)	pH (units)	Cond. (µS/cm)	DO (mg/L)	ORP (mV)	CH4 (% Iel)	H2S (ppm)	Observations				
					Needed	Actual								Clarity	Colour	Odour	Sheen	Other
TW02-1	7.13	9.78	50.8	0.55	16	Dry x1 10	15.9	7.14	681	8.44	113	<1	<0.1	Cloudy	Brown	None	None	
TW02-2	5.21	6.87	50.8	0.75	10	Dry x1 4	13.9	7.33	472	9.69	110	<1	<0.1	Clear	None	None	None	QA/QC #1 QA/QC - VOCs
TW03-1	6.33	7.42	50.8	0.68	6	Dry x1 2	11.9	6.70	894	0.04	75	12 % vol	<0.1	Opaque	Orange	None	None	
TW04-1	7.91	11.13	50.8	0.10	18	18	15.6	7.11	512	5.11	57	<1	<0.1	Clear	None	None	None	QA/QC #2
TW05-1	3.68	7.97	50.8	0.97	24	Dry x1 12	12.4	6.90	2354	5.98	85	<1	<0.1	Cloudy	Grey	None	None	
TW05-2	3.62	5.75	50.8	0.97	12	Dry x1 4	12.4	7.20	2946	8.28	88	<1	<0.1	Cloudy	None	None	None	
TW06-1	2.90	5.88	32.1	0.77	7.5	Dry x1 6	14.8	6.89	890	2.19	62	<1	<0.1	Clear	None	None	None	
TW06-2	2.68	4.08	50.8	0.80	9	Dry x1 3	12.1	7.16	1012	2.82	53	<1	<0.1	Clear	None	None	None	
TW07-1	1.92	10.03	25.4	0.89	9	9	11.9	7.29	519	2.23	-4	<1	<0.1	Clear	None	None	None	
TW07-2	2.30	5.24	50.8	1.06	18	Dry x1 10	11.9	7.02	1575	2.51	22	<1	<0.1	Cloudy	Orange	None	None	
TW08-1	7.40	11.59	50.8	0.78	17	17	12.4	7.42	456	8.18	114	<1	<0.1	Opaque	Grey	None	None	
TW08-2	5.21	5.33	50.8	0.80	-	-	-	-	-	-	-	<1	<0.1	-	-	-	-	Insufficient Volume
TW09-1	0.77	10.54	50.8	0.81	54	54	11.5	7.25	527	2.47	61	<1	<0.1	Clear	None	None	None	
TW09-2	1.01	4.29	50.8	1.02	18	Dry x1 6	14.8	7.61	463	9.85	56	<1	<0.1	Opaque	Grey	None	None	
TW10-2	3.18	3.78	50.8	0.82	3	Dry x1 1.5	14.0	6.70	1175	6.05	-33	<1	<0.1	Opaque	Orange	None	None	
TW11-2	4.99	6.83	50.8	0.85	12	12	17.6	6.64	1844	4.05	-25	1	<0.1	Opaque	Orange	None	None	



LOCATION: Stoney Lake WDS

DATE: June 28, 2021

WEATHER (SAMPLE DAY): 2°C Sun 12°C

PROJECT NUMBER: 12987-004

SAMPLED BY: N. Morin and M. Pion

WEATHER (PREVIOUS DAY): 10°C Sun

FIELD SHEET – GROUNDWATER DEVELOPMENT & SAMPLING

Sample Location	Water Level	B.H. Depth (m)	B.H. Dia. (mm)	Stick - Up (m)	Purge Volumes (L)		Temp (°C)	pH (units)	Cond. (µS/cm)	DO (mg/L)	ORP (mV)	CH4 (% lcl)	H2S (ppm)	Observations				
					Needed	Actual								Clarity	Colour	Odour	Sheen	Other
GP1	4.17	4.31	50.8	0.84	-	-	-	-	-	-	-	12.5 % vol	<0.1	-	-	-	-	
GP2	4.21	4.41	50.8	0.78	-	-	-	-	-	-	-	8 % vol	<0.1	-	-	-	-	
Sorting Building	-	-	-	-	-	-	-	-	-	-	-	<1	<0.1	-	-	-	-	
Office	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Did not measure due to COVID-19



LOCATION: Stoney Lake WDS

DATE: November 10, 2021

WEATHER (SAMPLE DAY): 2°C Sun 12°C

PROJECT NUMBER: 12987-004

SAMPLED BY: N. Morin, M. Pion and
W. Verduyn

WEATHER (PREVIOUS DAY): 10°C Sun

FIELD SHEET – GROUNDWATER DEVELOPMENT & SAMPLING

Sample Location	Water Level	B.H. Depth (m)	B.H. Dia. (mm)	Stick - Up (m)	Purge Volumes (L)		Temp (°C)	pH (units)	Cond. (µS/cm)	DO (mg/L)	ORP (mV)	CH4 (% lcl)	H2S (ppm)	Observations				
					Needed	Actual								Clarity	Colour	Odour	Sheen	Other
TW02-1	6.11	9.78	50.8	0.55	23	23	11.0	7.16	225	10.08	63	<1	<0.1	Clear	None	None	None	
TW02-2	3.75	6.87	50.8	0.75	19	Dry x 1 7	12.2	6.94	264	6.25	64	<1	<0.1	Clear	None	None	None	
TW03-1	5.86	7.42	50.8	0.68	10	Dry x 1 4	10.3	6.68	530	0.82	106	23	<0.1	Opaque	Brown	Leachate	None	
TW04-1	7.23	11.13	50.8	0.10	24	24	10.0	7.21	254	9.41	11	1	<0.1	Clear	None	None	None	QA/QC #1
TW05-1	3.22	7.97	50.8	0.97	29	Dry x 1 10	9.6	6.86	1101	5.74	63	<1	<0.1	Cloudy	None	None	None	
TW05-2	3.19	5.75	50.8	0.97	16	Dry x 1 5	10.1	6.90	1393	6.61	60	<1	<0.1	Clear	None	None	None	
TW06-1	2.34	5.88	32.1	0.77	9	9	10.4	6.82	383	3.18	33	<1	<0.1	Cloudy	None	None	None	
TW06-2	2.12	4.08	50.8	0.80	12	12	9.5	7.12	341	3.84	29	<1	<0.1	Clear	None	None	-	QA/QC #2 QA/QC - VOCs
TW07-1	1.48	10.03	25.4	0.89	14	14	9.2	7.33	229	4.56	21	<1	<0.1	Clear	None	None	None	
TW07-2	2.14	5.24	50.8	1.06	19	19	11.0	6.92	669	3.19	56	<1	<0.1	Cloudy	None	None	None	
TW08-1	6.35	11.59	50.8	0.78	38	38	10.4	7.20	237	6.62	57	<1	<0.1	Cloudy	Grey	None	None	
TW08-2	3.75	5.33	50.8	0.80	10	10	12.1	7.27	219	9.69	56	<1	<0.1	Cloudy	Grey	None	None	
TW09-1	0.33	10.54	50.8	0.81	63	63	8.8	7.29	227	3.20	16	<1	<0.1	Clear	None	None	None	
TW09-2	0.89	4.29	50.8	1.02	21	Dry x 1 7	9.1	7.54	235	8.19	11	<1	<0.1	Opaque	Grey	None	None	
TW10-2	2.45	3.78	50.8	0.82	9	Dry x 1 7	10.8	6.69	550	5.27	50	37	<0.1	Cloudy	Grey	None	None	
TW11-2	4.34	6.83	50.8	0.85	16	16	10.1	7.12	294	5.48	27	79	<0.1	Cloudy	Orange	None	None	



LOCATION: Stoney Lake WDS

DATE: November 10, 2021

WEATHER (SAMPLE DAY): 2°C Sun 12°C

PROJECT NUMBER: 12987-004

SAMPLED BY: N. Morin, M. Pion and
W. Verduyn

WEATHER (PREVIOUS DAY): 10°C Sun

FIELD SHEET – GROUNDWATER DEVELOPMENT & SAMPLING

Sample Location	Water Level	B.H. Depth (m)	B.H. Dia. (mm)	Stick - Up (m)	Purge Volumes (L)		Temp (°C)	pH (units)	Cond. (µS/cm)	DO (mg/L)	ORP (mV)	CH4 (% lsl)	H2S (ppm)	Observations				
					Needed	Actual								Clarity	Colour	Odour	Sheen	Other
GP1	4.20	4.31	50.8	0.84	-	-	-	-	-	-	-	19.0 % vol	<0.1	-	-	-	-	
GP2	4.31	4.41	50.8	0.78	-	-	-	-	-	-	-	12 % vol	<0.1	-	-	-	-	
Sorting Building	-	-	-	-	-	-	-	-	-	-	-	<1	<0.1	-	-	-	-	
Office	-	-	-	-	-	-	-	-	-	-	-	<1	<0.1	-	-	-	-	



LOCATION: Stoney Lake WDS

DATE: June 28, 2021

WEATHER (SAMPLE DAY): 22°C Sun 29°C

PROJECT NUMBER: 12987-004

SAMPLED BY: M. Pion and N. Morin

WEATHER (PREVIOUS DAY): 28°C Rain

FIELD SHEET – SURFACE WATER SAMPLING

Sample Location	Depth (m)	Width (m)	Velocity (m/s)	Discharge (m³/s)	Temp (°C)	pH (units)	Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Observations				
										Clarity	Colour	Odour	Sheen	Other
SW1	0.37	0.75	Ponded - No Observable Flow		26.8	7.31	485	6.49	67	Clear	None	None	None	QA/QC
SW3	-	-	-	-	-	-	-	-	-	-	-	-	-	Dry
SW6	-	-	-	-	-	-	-	-	-	-	-	-	-	Dry
SW8	0.15	Ponded - No Observable Flow			29.5	8.40	340	13.88	67	Clear	Yellow	None	None	



LOCATION: Stoney Lake WDS

DATE: November 10, 2021

WEATHER (SAMPLE DAY): 2°C Sun 12°C

PROJECT NUMBER: 12987-004

SAMPLED BY: M. Pion, N. Morin and
W. Verduyn

WEATHER (PREVIOUS DAY): 10°C Sun

FIELD SHEET – SURFACE WATER SAMPLING

Sample Location	Depth (m)	Width (m)	Velocity (m/s)	Discharge (m³/s)	Temp (°C)	pH (units)	Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Observations				
										Clarity	Colour	Odour	Sheen	Other
SW1	0.60	0.75	0.10	0.045	6.8	7.58	204	9.17	20	Clear	None	None	None	QA/QC Culvert damaged
SW3	0.05	Ponded - No Observable Flow			6.7	7.55	372	8.06	43	Clear	None	None	None	
SW6	0.15	Ponded - No Observable Flow			6.0	7.87	365	5.21	28	Clear	None	None	None	
SW8	0.15	Ponded - No Observable Flow			6.6	7.72	191	10.35	20	Clear	None	None	None	Area flooded



Daily Data Report for June 2021

PETERBOROUGH TRENT U
ONTARIO
Current Station Operator: ECCC - MSC

Latitude: 44°21'00.000" N Longitude: 78°18'00.000" W Elevation: 216.00 m
Climate ID: 6166456 WMO ID: 71672 TC ID: TPQ

Table with 12 columns: DAY, Max Temp (°C), Min Temp (°C), Mean Temp (°C), Heat Deg Days, Cool Deg Days, Total Rain (mm), Total Snow (cm), Total Precip (mm), Snow on Grnd (cm), Dir of Max Gust (10's deg), Spd of Max Gust (km/h). Rows include daily data from 01 to 30 and a Sum row.



Daily Data Report for August 2021

PETERBOROUGH TRENT U
ONTARIO
Current Station Operator: ECCC - MSC

Latitude: 44°21'00.000" N Longitude: 78°18'00.000" W Elevation: 216.00 m
Climate ID: 6166456 WMO ID: 71672 TC ID: TPQ

Table with 12 columns: DAY, Max Temp (°C), Min Temp (°C), Mean Temp (°C), Heat Deg Days, Cool Deg Days, Total Rain (mm), Total Snow (cm), Total Precip (mm), Snow on Grnd (cm), Dir of Max Gust (10's deg), Spd of Max Gust (km/h). Rows include daily data from 01 to 31 and a Sum row.



Daily Data Report for November 2021

PETERBOROUGH TRENT U
ONTARIO
Current Station Operator: ECCC - MSC

Latitude: 44°21'00.000" N Longitude: 78°18'00.000" W Elevation: 216.00 m
Climate ID: 6166456 WMO ID: 71672 TC ID: TPQ

Table with 12 columns: DAY, Max Temp (°C), Min Temp (°C), Mean Temp (°C), Heat Deg Days, Cool Deg Days, Total Rain (mm), Total Snow (cm), Total Precip (mm), Snow on Grnd (cm), Dir of Max Gust (10's deg), Spd of Max Gust (km/h). Rows include daily data from 01 to 30 and a Sum row.



Appendix E

Laboratory Certificates of Analysis

Fully accessible appended items are available upon request.

C.O.C.: G098358

REPORT No. B21-20225 (i)

Report To:

Cambium Environmental
194 Sophia St.,
Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 30-Jun-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 13-Jul-21

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW8-1	TW2-2	GW_QAQC1	TW2-1
					Sample I.D.	B21-20225-1	B21-20225-2	B21-20225-3	B21-20225-4
Date Collected					28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	05-Jul-21/O		225	416	420	227
Conductivity @25°C	µmho/cm	1	SM 2510B	05-Jul-21/O		469	857	861	484
pH @25°C	pH Units		SM 4500H	05-Jul-21/O		7.85	7.65	7.62	7.82
Total Dissolved Solids	mg/L	3	SM 2540D	07-Jul-21/O		242	453	455	250
Total Suspended Solids	mg/L	3	SM2540D	06-Jul-21/K			109	96	
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	05-Jul-21/O		2.6			2.8
BOD(5 day)	mg/L	3	SM 5210B	02-Jul-21/K			< 3	< 3	
COD	mg/L	5	SM5220C	02-Jul-21/K		< 5	25	32	11
Phenolics	mg/L	0.002	MOEE 3179	06-Jul-21/K		< 0.002	< 0.002	< 0.002	< 0.002
Chloride	mg/L	0.5	SM4110C	06-Jul-21/O		4.3	4.8	4.8	5.2
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	05-Jul-21/K		< 0.01	0.03	0.03	0.01
Sulphate	mg/L	1	SM4110C	06-Jul-21/O		6	36	36	6
Nitrite (N)	mg/L	0.05	SM4110C	06-Jul-21/O		< 0.05	< 0.05	< 0.05	
Nitrate (N)	mg/L	0.05	SM4110C	06-Jul-21/O		1.37	0.12	0.12	1.47
Mercury	mg/L	0.00002	SM 3112 B	06-Jul-21/O		< 0.00002	< 0.00002	< 0.00002	
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Jul-21/K		0.3	0.7	1.4	
Hardness (as CaCO3)	mg/L	1	SM 3120	06-Jul-21/O		256	450	442	267
Arsenic	mg/L	0.0001	EPA 200.8	06-Jul-21/O		< 0.0001	0.0002	0.0002	
Barium	mg/L	0.001	SM 3120	06-Jul-21/O		0.032	0.056	0.055	0.021
Boron	mg/L	0.005	SM 3120	06-Jul-21/O		0.009	0.033	0.033	0.007
Cadmium	mg/L	0.000015	EPA 200.8	06-Jul-21/O		< 0.000015	< 0.000015	< 0.000015	
Calcium	mg/L	0.02	SM 3120	06-Jul-21/O		98.3			103
Chromium	mg/L	0.001	EPA 200.8	06-Jul-21/O		< 0.001	< 0.001	< 0.001	
Copper	mg/L	0.0001	EPA 200.8	06-Jul-21/O		0.0006	0.0019	0.0021	
Iron	mg/L	0.005	SM 3120	06-Jul-21/O		0.014	1.74	1.71	0.008
Lead	mg/L	0.00002	EPA 200.8	06-Jul-21/O		0.00004	0.00008	0.00008	
Magnesium	mg/L	0.02	SM 3120	06-Jul-21/O		2.56			2.21

R.L. = Reporting Limit

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

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Michelle Dubien
Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: G098358

REPORT No. B21-20225 (i)

Report To:

Cambium Environmental
 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1
 Tel: 613-544-2001
 Fax: 613-544-2770

DATE RECEIVED: 30-Jun-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 13-Jul-21

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW8-1	TW2-2	GW_QAQC1	TW2-1
					Sample I.D.	B21-20225-1	B21-20225-2	B21-20225-3	B21-20225-4
Manganese	mg/L	0.001	SM 3120	06-Jul-21/O	Date Collected	28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Jul-21/K		0.001	0.14	0.14	
Potassium	mg/L	0.1	SM 3120	06-Jul-21/O		0.6			
Sodium	mg/L	0.2	SM 3120	06-Jul-21/O		2.5			2.3
Zinc	mg/L	0.005	SM 3120	06-Jul-21/O		< 0.005	< 0.005	< 0.005	



Michelle Dubien
 Lab Manager

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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	TW3-1	TW11-2	TW4-1	GW_QAQC2
Sample I.D.	B21-20225-5	B21-20225-6	B21-20225-7	B21-20225-8
Date Collected	28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	05-Jul-21/O	435	776	241	244
Conductivity @25°C	µmho/cm	1	SM 2510B	05-Jul-21/O	954	1940	520	527
pH @25°C	pH Units		SM 4500H	05-Jul-21/O	7.39	7.06	7.75	7.75
Total Dissolved Solids	mg/L	3	SM 2540D	07-Jul-21/O	508	1070	269	273
Total Suspended Solids	mg/L	3	SM2540D	06-Jul-21/K		2550		
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	05-Jul-21/O	17.8		3.4	3.1
BOD(5 day)	mg/L	3	SM 5210B	02-Jul-21/K		17		
COD	mg/L	5	SM5220C	02-Jul-21/K	2640	128	< 5	< 5
Phenolics	mg/L	0.002	MOEE 3179	06-Jul-21/K	< 0.002	< 0.002	< 0.002	< 0.002
Chloride	mg/L	0.5	SM4110C	06-Jul-21/O	14.7	106	6.2	6.4
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	05-Jul-21/K	21.3	44.5	0.02	0.03
Sulphate	mg/L	1	SM4110C	06-Jul-21/O	26	102	9	10
Nitrite (N)	mg/L	0.05	SM4110C	06-Jul-21/O		< 0.05		
Nitrate (N)	mg/L	0.05	SM4110C	06-Jul-21/O	0.15	0.12	1.74	1.62
Mercury	mg/L	0.00002	SM 3112 B	06-Jul-21/O		< 0.00002		
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Jul-21/K		47.1		
Hardness (as CaCO3)	mg/L	1	SM 3120	06-Jul-21/O	348	772	286	304
Arsenic	mg/L	0.0001	EPA 200.8	06-Jul-21/O		0.0010		
Barium	mg/L	0.001	SM 3120	06-Jul-21/O	0.223	0.574	0.022	0.023
Boron	mg/L	0.005	SM 3120	06-Jul-21/O	0.222	0.616	0.013	0.012
Cadmium	mg/L	0.000015	EPA 200.8	06-Jul-21/O		< 0.000029		
Calcium	mg/L	0.02	SM 3120	06-Jul-21/O	122		111	118
Chromium	mg/L	0.001	EPA 200.8	06-Jul-21/O		0.043		
Copper	mg/L	0.0001	EPA 200.8	06-Jul-21/O		0.0007		
Iron	mg/L	0.005	SM 3120	06-Jul-21/O	9.45	34.4	0.012	< 0.005
Lead	mg/L	0.00002	EPA 200.8	06-Jul-21/O		0.00017		
Magnesium	mg/L	0.02	SM 3120	06-Jul-21/O	10.5		2.16	2.22



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Lab Manager

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DATE RECEIVED: 30-Jun-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 13-Jul-21

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW3-1	TW11-2	TW4-1	GW_QAQC2
					Sample I.D.	Date Collected	B21-20225-5	B21-20225-6	B21-20225-7
Manganese	mg/L	0.001	SM 3120	06-Jul-21/O					
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Jul-21/K			1.43		
Potassium	mg/L	0.1	SM 3120	06-Jul-21/O					
Sodium	mg/L	0.2	SM 3120	06-Jul-21/O		17.7		3.7	3.7
Zinc	mg/L	0.005	SM 3120	06-Jul-21/O			< 0.005		



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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW10-2	TW6-1	TW6-2	TW7-1
					Sample I.D.	B21-20225-9	B21-20225-10	B21-20225-11	B21-20225-12
Date Collected					28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	05-Jul-21/O		563	352	419	222
Conductivity @25°C	µmho/cm	1	SM 2510B	05-Jul-21/O		1150	950	1080	510
pH @25°C	pH Units		SM 4500H	05-Jul-21/O		7.34	7.52	7.72	7.89
Total Dissolved Solids	mg/L	3	SM 2540D	07-Jul-21/O		620	505	577	264
Total Suspended Solids	mg/L	3	SM2540D	06-Jul-21/K		1280		24	
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	05-Jul-21/O			5.9		3.5
BOD(5 day)	mg/L	3	SM 5210B	02-Jul-21/K		12		3	
COD	mg/L	5	SM5220C	02-Jul-21/K		85	11	9	< 5
Phenolics	mg/L	0.002	MOEE 3179	06-Jul-21/K		< 0.002	< 0.002	< 0.002	< 0.002
Chloride	mg/L	0.5	SM4110C	06-Jul-21/O		21.0	38.4	36.4	14.1
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	05-Jul-21/K		20.9	1.07	0.16	0.02
Sulphate	mg/L	1	SM4110C	06-Jul-21/O		7	90	106	18
Nitrite (N)	mg/L	0.05	SM4110C	06-Jul-21/O		< 0.05	0.19	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	06-Jul-21/O		0.52	1.03	1.94	0.13
Mercury	mg/L	0.00002	SM 3112 B	06-Jul-21/O		< 0.00002	< 0.00002	< 0.00002	< 0.00002
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Jul-21/K		26.0	1.4	0.6	0.2
Hardness (as CaCO3)	mg/L	1	SM 3120	06-Jul-21/O		525	486	582	267
Arsenic	mg/L	0.0001	EPA 200.8	06-Jul-21/O		0.0009	< 0.0001	0.0002	0.0002
Barium	mg/L	0.001	SM 3120	06-Jul-21/O		0.344	0.296	0.237	0.189
Boron	mg/L	0.005	SM 3120	06-Jul-21/O		0.387	0.110	0.193	0.025
Cadmium	mg/L	0.000015	EPA 200.8	06-Jul-21/O		0.000031	0.000019	0.000017	< 0.000015
Calcium	mg/L	0.02	SM 3120	06-Jul-21/O			178		98.5
Chromium	mg/L	0.001	EPA 200.8	06-Jul-21/O		0.001	< 0.001	< 0.001	< 0.001
Copper	mg/L	0.0001	EPA 200.8	06-Jul-21/O		0.0003	0.0019	0.0026	0.0004
Iron	mg/L	0.005	SM 3120	06-Jul-21/O		30.5	0.017	0.017	0.317
Lead	mg/L	0.00002	EPA 200.8	06-Jul-21/O		0.00007	0.00005	0.00006	0.00004



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 Lab Manager

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 Fax: 613-544-2770

DATE RECEIVED: 30-Jun-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 13-Jul-21

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW10-2	TW6-1	TW6-2	TW7-1
					Sample I.D.				
					B21-20225-9	B21-20225-10	B21-20225-11	B21-20225-12	
					Date Collected	28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21
Magnesium	mg/L	0.02	SM 3120	06-Jul-21/O			9.90		4.93
Manganese	mg/L	0.001	SM 3120	06-Jul-21/O			1.19		0.011
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Jul-21/K	0.81	0.09	0.03		0.02
Potassium	mg/L	0.1	SM 3120	06-Jul-21/O			5.0		1.1
Sodium	mg/L	0.2	SM 3120	06-Jul-21/O			24.8		9.0
Zinc	mg/L	0.005	SM 3120	06-Jul-21/O	0.006	< 0.005	< 0.005		< 0.005



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 Lab Manager

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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW7-2	TW5-1	TW5-2	TW9-1
					Sample I.D.	B21-20225-13	B21-20225-14	B21-20225-15	B21-20225-16
Date Collected					28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	05-Jul-21/O		307	450	379	229
Conductivity @25°C	µmho/cm	1	SM 2510B	05-Jul-21/O		17100	2750	3610	533
pH @25°C	pH Units		SM 4500H	05-Jul-21/O		7.59	7.36	7.65	7.83
Total Dissolved Solids	mg/L	3	SM 2540D	07-Jul-21/O		939	1530	2020	276
Total Suspended Solids	mg/L	3	SM2540D	06-Jul-21/K		134		46	
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	05-Jul-21/O			8.6		4.4
BOD(5 day)	mg/L	3	SM 5210B	02-Jul-21/K		< 3		< 3	
COD	mg/L	5	SM5220C	02-Jul-21/K		14	39	29	< 5
Phenolics	mg/L	0.002	MOEE 3179	06-Jul-21/K		< 0.002	< 0.002	< 0.002	< 0.002
Chloride	mg/L	0.5	SM4110C	06-Jul-21/O		176	158	120	15.1
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	05-Jul-21/K		0.14	1.29	0.02	0.03
Sulphate	mg/L	1	SM4110C	06-Jul-21/O		362	973	1680	19
Nitrite (N)	mg/L	0.05	SM4110C	06-Jul-21/O		< 0.05		< 0.5	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	06-Jul-21/O		0.06	1.00	7.20	< 0.05
Mercury	mg/L	0.00002	SM 3112 B	06-Jul-21/O		< 0.00002		< 0.00002	< 0.00002
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Jul-21/K		0.5		1.0	0.2
Hardness (as CaCO3)	mg/L	1	SM 3120	06-Jul-21/O		760	1540	2270	283
Arsenic	mg/L	0.0001	EPA 200.8	06-Jul-21/O		< 0.003		0.0003	< 0.0001
Barium	mg/L	0.001	SM 3120	06-Jul-21/O		0.105	0.028	0.028	0.116
Boron	mg/L	0.005	SM 3120	06-Jul-21/O		1.50	4.60	10.2	0.024
Cadmium	mg/L	0.00015	EPA 200.8	06-Jul-21/O		< 0.00030		< 0.000029	< 0.000015
Calcium	mg/L	0.02	SM 3120	06-Jul-21/O			444		105
Chromium	mg/L	0.001	EPA 200.8	06-Jul-21/O		< 0.003		< 0.001	< 0.001
Copper	mg/L	0.0001	EPA 200.8	06-Jul-21/O		< 0.002		0.0097	0.0003
Iron	mg/L	0.005	SM 3120	06-Jul-21/O		6.41	7.46	0.206	0.010
Lead	mg/L	0.00002	EPA 200.8	06-Jul-21/O		< 0.0009		0.00023	0.00003



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P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW7-2	TW5-1	TW5-2	TW9-1
					Sample I.D.	Date Collected			
Magnesium	mg/L	0.02	SM 3120	06-Jul-21/O	B21-20225-13	28-Jun-21	105		5.01
Manganese	mg/L	0.001	SM 3120	06-Jul-21/O	B21-20225-14	28-Jun-21			0.011
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Jul-21/K	B21-20225-15	28-Jun-21	0.17	0.05	< 0.01
Potassium	mg/L	0.1	SM 3120	06-Jul-21/O	B21-20225-16	28-Jun-21			1.0
Sodium	mg/L	0.2	SM 3120	06-Jul-21/O			143		7.3
Zinc	mg/L	0.005	SM 3120	06-Jul-21/O			< 0.005	< 0.01	< 0.005



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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	TW9-2		
Sample I.D.	B21-20225-17		
Date Collected	28-Jun-21		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	05-Jul-21/O	228		
Conductivity @25°C	µmho/cm	1	SM 2510B	05-Jul-21/O	493		
pH @25°C	pH Units		SM 4500H	05-Jul-21/O	7.83		
Total Dissolved Solids	mg/L	3	SM 2540D	07-Jul-21/O	255		
Total Suspended Solids	mg/L	3	SM2540D	06-Jul-21/K	2000		
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	05-Jul-21/O			
BOD(5 day)	mg/L	3	SM 5210B	02-Jul-21/K	4		
COD	mg/L	5	SM5220C	02-Jul-21/K	69		
Phenolics	mg/L	0.002	MOEE 3179	06-Jul-21/K	< 0.002		
Chloride	mg/L	0.5	SM4110C	06-Jul-21/O	4.5		
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	05-Jul-21/K	0.22		
Sulphate	mg/L	1	SM4110C	06-Jul-21/O	16		
Nitrite (N)	mg/L	0.05	SM4110C	06-Jul-21/O	< 0.05		
Nitrate (N)	mg/L	0.05	SM4110C	06-Jul-21/O	0.38		
Mercury	mg/L	0.00002	SM 3112 B	06-Jul-21/O	< 0.00002		
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Jul-21/K	1.6		
Hardness (as CaCO3)	mg/L	1	SM 3120	06-Jul-21/O	282		
Arsenic	mg/L	0.0001	EPA 200.8	06-Jul-21/O	< 0.0001		
Barium	mg/L	0.001	SM 3120	06-Jul-21/O	0.276		
Boron	mg/L	0.005	SM 3120	06-Jul-21/O	0.014		
Cadmium	mg/L	0.000015	EPA 200.8	06-Jul-21/O	< 0.000015		
Calcium	mg/L	0.02	SM 3120	06-Jul-21/O			
Chromium	mg/L	0.001	EPA 200.8	06-Jul-21/O	0.002		
Copper	mg/L	0.0001	EPA 200.8	06-Jul-21/O	0.0002		
Iron	mg/L	0.005	SM 3120	06-Jul-21/O	0.218		
Lead	mg/L	0.00002	EPA 200.8	06-Jul-21/O	0.00008		



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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	TW9-2			
Sample I.D.	B21-20225-17			
Date Collected	28-Jun-21			

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Magnesium	mg/L	0.02	SM 3120	06-Jul-21/O			
Manganese	mg/L	0.001	SM 3120	06-Jul-21/O			
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Jul-21/K	0.68		
Potassium	mg/L	0.1	SM 3120	06-Jul-21/O			
Sodium	mg/L	0.2	SM 3120	06-Jul-21/O			
Zinc	mg/L	0.005	SM 3120	06-Jul-21/O	< 0.005		



Michelle Dubien
 Lab Manager

R.L. = Reporting Limit

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

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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C.O.C.: G098358

REPORT No. B21-20225 (ii)

Report To:

Cambium Environmental
194 Sophia St.,
Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 30-Jun-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 13-Jul-21

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW8-1	TW2-2	GW_QAQC1	TW6-1
					Sample I.D.	B21-20225-1	B21-20225-2	B21-20225-3	B21-20225-10
Date Collected					28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21
Benzene	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	µg/L	2	EPA 8260	02-Jul-21/R		< 2	< 2	< 2	
Bromoform	µg/L	5	EPA 8260	02-Jul-21/R		< 5	< 5	< 5	
Bromomethane	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Carbon Tetrachloride	µg/L	0.2	EPA 8260	02-Jul-21/R		< 0.2	< 0.2	< 0.2	
Chloroethane	µg/L	3	EPA 8260	02-Jul-21/R		< 3	< 3	< 3	
Chloroform	µg/L	1	EPA 8260	02-Jul-21/R		< 1	< 1	< 1	
Chloromethane	µg/L	2	EPA 8260	02-Jul-21/R		< 2	< 2	< 2	
Dibromochloromethane	µg/L	2	EPA 8260	02-Jul-21/R		< 2	< 2	< 2	
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	EPA 8260	02-Jul-21/R		< 0.2	< 0.2	< 0.2	
Dichlorobenzene, 1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Dichlorobenzene, 1,3-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Dichlorobenzene, 1,4-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloroethane, 1,1-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Dichloroethane, 1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Dichloroethylene, 1,1-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Dichloroethene, cis-1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Dichloroethene, trans-1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	02-Jul-21/R	< 5	< 5	< 5	< 5	< 5
Dichloropropane, 1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Dichloropropene 1,3- cis+trans	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Dichloropropene, trans-1,3-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Dichloropropene, cis-1,3-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	



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Michelle Dubien
Lab Manager

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C.O.C.: G098358

REPORT No. B21-20225 (ii)

Report To:

Cambium Environmental
 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1

Tel: 613-544-2001

Fax: 613-544-2770

DATE RECEIVED: 30-Jun-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 13-Jul-21

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW8-1	TW2-2	GW_QAQC1	TW6-1
					Sample I.D.	B21-20225-1	B21-20225-2	B21-20225-3	B21-20225-10
Date Collected					28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21	28-Jun-21
Styrene	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Tetrachloroethane,1,1,2,2-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Tetrachloroethylene	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Toluene	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethane,1,1,1-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Trichloroethane,1,1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Trichloroethylene	µg/L	0.5	EPA 8260	02-Jul-21/R		< 0.5	< 0.5	< 0.5	
Trichlorofluoromethane	µg/L	5	EPA 8260	02-Jul-21/R		< 5	< 5	< 5	
Vinyl Chloride	µg/L	0.2	EPA 8260	02-Jul-21/R	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2



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DATE RECEIVED: 30-Jun-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 13-Jul-21

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW6-2	TW7-1	TW9-1
					Sample I.D.			
					B21-20225-11	B21-20225-12	B21-20225-16	
					Date Collected	28-Jun-21	28-Jun-21	28-Jun-21
Benzene	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5	< 0.5	< 0.5	
Bromodichloromethane	µg/L	2	EPA 8260	02-Jul-21/R	< 2			
Bromoform	µg/L	5	EPA 8260	02-Jul-21/R	< 5			
Bromomethane	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Carbon Tetrachloride	µg/L	0.2	EPA 8260	02-Jul-21/R	< 0.2			
Chloroethane	µg/L	3	EPA 8260	02-Jul-21/R	< 3			
Chloroform	µg/L	1	EPA 8260	02-Jul-21/R	< 1			
Chloromethane	µg/L	2	EPA 8260	02-Jul-21/R	< 2			
Dibromochloromethane	µg/L	2	EPA 8260	02-Jul-21/R	< 2			
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	EPA 8260	02-Jul-21/R	< 0.2			
Dichlorobenzene, 1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Dichlorobenzene, 1,3-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Dichlorobenzene, 1,4-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5	< 0.5	< 0.5	
Dichloroethane, 1,1-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Dichloroethane, 1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Dichloroethylene, 1,1-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Dichloroethene, cis-1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Dichloroethene, trans-1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	02-Jul-21/R	< 5	< 5	< 5	
Dichloropropane, 1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Dichloropropene 1,3- cis+trans	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Dichloropropene, trans-1,3-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Dichloropropene, cis-1,3-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			



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Michelle Dubien
 Lab Manager

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 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1
 Tel: 613-544-2001
 Fax: 613-544-2770

DATE RECEIVED: 30-Jun-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 13-Jul-21

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	TW6-2	TW7-1	TW9-1	
Sample I.D.	B21-20225-11	B21-20225-12	B21-20225-16	
Date Collected	28-Jun-21	28-Jun-21	28-Jun-21	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Styrene	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Tetrachloroethylene	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Toluene	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5	< 0.5	< 0.5	
Trichloroethane, 1,1,1-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Trichloroethane, 1,1,2-	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Trichloroethylene	µg/L	0.5	EPA 8260	02-Jul-21/R	< 0.5			
Trichlorofluoromethane	µg/L	5	EPA 8260	02-Jul-21/R	< 5			
Vinyl Chloride	µg/L	0.2	EPA 8260	02-Jul-21/R	< 0.2	< 0.2	< 0.2	



Michelle Dubien
 Lab Manager

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C.O.C.: G098359

REPORT No. B21-20219

Rev. 2

Report To:

Cambium Environmental
 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1
 Tel: 613-544-2001
 Fax: 613-544-2770

DATE RECEIVED: 30-Jun-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 30-Mar-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

Client I.D.	SW-1	SW_QAQC	SW-8
Sample I.D.	B21-20219-1	B21-20219-2	B21-20219-3
Date Collected	28-Jun-21	28-Jun-21	28-Jun-21

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	SW-1	SW_QAQC	SW-8
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	05-Jul-21/O	247	249	177
Conductivity @25°C	µmho/cm	1	SM 2510B	05-Jul-21/O	490	491	341
pH @25°C	pH Units		SM 4500H	05-Jul-21/O	7.96	7.90	8.27
Total Dissolved Solids	mg/L	1	SM 2540D	07-Jul-21/O	254	254	175
Total Suspended Solids	mg/L	3	SM2540D	06-Jul-21/K	3	4	6
BOD(5 day)	mg/L	3	SM 5210B	02-Jul-21/K	< 3	< 3	< 3
COD	mg/L	5	SM5220C	02-Jul-21/K	26	27	37
Phenolics	mg/L	0.001	MOEE 3179	06-Jul-21/K	< 0.001	< 0.001	< 0.001
Chloride	mg/L	0.5	SM4110C	06-Jul-21/O	12.7	11.9	4.5
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	05-Jul-21/K	0.05	0.04	0.03
Ammonia (N)-unionized	mg/L	0.01	CALC	05-Jul-21/K	< 0.01	< 0.01	< 0.01
Sulphate	mg/L	1	SM4110C	06-Jul-21/O	3	3	7
Nitrite (N)	mg/L	0.05	SM4110C	06-Jul-21/O	< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	06-Jul-21/O	0.05	< 0.05	< 0.05
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	08-Jul-21/K	0.5	0.5	0.6
Mercury	mg/L	0.00002	SM 3112 B	06-Jul-21/O	< 0.00002	< 0.00002	< 0.00002
Hardness (as CaCO3)	mg/L	1	SM 3120	05-Jul-21/O	234	239	186
Arsenic	mg/L	0.0001	EPA 200.8	05-Jul-21/O	0.0006	0.0006	0.0010
Barium	mg/L	0.001	SM 3120	05-Jul-21/O	0.076	0.077	0.049
Boron	mg/L	0.005	SM 3120	05-Jul-21/O	0.029	0.028	0.018
Cadmium	mg/L	0.000015	EPA 200.8	05-Jul-21/O	< 0.000015	< 0.000015	< 0.000015
Calcium	mg/L	0.02	SM 3120	05-Jul-21/O	89.4	91.3	70.5
Chromium	mg/L	0.001	EPA 200.8	05-Jul-21/O	< 0.001	< 0.001	< 0.001
Copper	mg/L	0.0001	EPA 200.8	05-Jul-21/O	0.0004	0.0004	0.0005
Iron	mg/L	0.005	SM 3120	05-Jul-21/O	0.603	0.618	0.262
Lead	mg/L	0.00002	EPA 200.8	05-Jul-21/O	0.00008	0.00007	0.00009
Magnesium	mg/L	0.02	SM 3120	05-Jul-21/O	2.54	2.56	2.44



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Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

Michelle Dubien
 Lab Manager

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C.O.C.: G098359

REPORT No. B21-20219

Rev. 2

Report To:

Cambium Environmental
 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1
 Tel: 613-544-2001
 Fax: 613-544-2770

DATE RECEIVED: 30-Jun-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 30-Mar-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

Client I.D.	SW-1	SW_QAQC	SW-8	
Sample I.D.	B21-20219-1	B21-20219-2	B21-20219-3	
Date Collected	28-Jun-21	28-Jun-21	28-Jun-21	

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Manganese	mg/L	0.001	SM 3120	05-Jul-21/O	0.172	0.176	0.034	
Phosphorus-Total	mg/L	0.01	E3516.2	08-Jul-21/K	0.03	0.02	0.04	
Potassium	mg/L	0.1	SM 3120	05-Jul-21/O	0.2	0.2	0.2	
Sodium	mg/L	0.2	SM 3120	05-Jul-21/O	8.8	8.8	3.8	
Zinc	mg/L	0.005	SM 3120	05-Jul-21/O	0.014	0.013	0.021	

1. Revised to include additional parameters



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Michelle Dubien
 Lab Manager

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C.O.C.: G100147

REPORT No. B21-27416

Rev. 1

Report To:

Cambium Environmental
 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1
 Tel: 613-544-2001
 Fax: 613-544-2770

DATE RECEIVED: 27-Aug-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 20-Jan-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

Client I.D.	SW1	SW_QAQC		
Sample I.D.	B21-27416-1	B21-27416-2		
Date Collected	26-Aug-21	26-Aug-21		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	30-Aug-21/O	269	268		
Conductivity @25°C	µmho/cm	1	SM 2510B	30-Aug-21/O	524	521		
pH @25°C	pH Units		SM 4500H	30-Aug-21/O	8.01	8.10		
Total Dissolved Solids	mg/L	3	SM 2540D	31-Aug-21/O	271	270		
Total Suspended Solids	mg/L	3	SM2540D	30-Aug-21/K	4	4		
BOD(5 day)	mg/L	3	SM 5210B	30-Aug-21/K	< 3	< 3		
COD	mg/L	5	SM5220C	31-Aug-21/K	26	29		
Phenolics	mg/L	0.001	MOEE 3179	01-Sep-21/K	< 0.001	< 0.001		
Chloride	mg/L	0.5	SM4110C	01-Sep-21/O	12.9	13.5		
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	03-Sep-21/K	0.03	0.04		
Ammonia (N)-unionized	mg/L	0.01	CALC	03-Sep-21/K	< 0.01	< 0.01		
Sulphate	mg/L	1	SM4110C	01-Sep-21/O	4	4		
Nitrite (N)	mg/L	0.05	SM4110C	01-Sep-21/O	0.06	< 0.05		
Nitrate (N)	mg/L	0.05	SM4110C	01-Sep-21/O	0.10	< 0.05		
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	01-Sep-21/K	0.6	0.6		
Mercury	mg/L	0.00002	SM 3112 B	01-Sep-21/O	< 0.00002	< 0.00002		
Hardness (as CaCO3)	mg/L	1	SM 3120	31-Aug-21/O	253	255		
Arsenic	mg/L	0.0001	EPA 200.8	01-Sep-21/O	0.0006	0.0005		
Barium	mg/L	0.001	SM 3120	31-Aug-21/O	0.082	0.082		
Boron	mg/L	0.005	SM 3120	31-Aug-21/O	0.023	0.025		
Cadmium	mg/L	0.000015	EPA 200.8	01-Sep-21/O	< 0.000015	< 0.000015		
Chromium	mg/L	0.001	EPA 200.8	01-Sep-21/O	< 0.001	< 0.001		
Copper	mg/L	0.0001	EPA 200.8	01-Sep-21/O	< 0.0001	0.0002		
Iron	mg/L	0.005	SM 3120	31-Aug-21/O	0.707	0.707		
Lead	mg/L	0.00002	EPA 200.8	01-Sep-21/O	0.00004	0.00002		
Phosphorus-Total	mg/L	0.01	E3199A.1	01-Sep-21/K	< 0.01	< 0.01		
Zinc	mg/L	0.005	SM 3120	31-Aug-21/O	0.019	0.016		



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 Lab Manager

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REPORT No. B21-27416

Rev. 1

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 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1
 Tel: 613-544-2001
 Fax: 613-544-2770

DATE RECEIVED: 27-Aug-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 20-Jan-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

Client I.D.	SW1	SW_QAQC		
Sample I.D.	B21-27416-1	B21-27416-2		
Date Collected	26-Aug-21	26-Aug-21		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed
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1 Revised to include U-NH3



R.L. = Reporting Limit

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

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Michelle Dubien
 Lab Manager

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C.O.C.: G100969

REPORT No. B21-37314 (i)

Report To:

Cambium Environmental
 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1
 Tel: 613-544-2001
 Fax: 613-544-2770

DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 05-Jan-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW2-2	TW2-1	TW8-1	TW8-2
					Sample I.D.	B21-37314-1	B21-37314-2	B21-37314-3	B21-37314-4
Date Collected					10-Nov-21	10-Nov-21	10-Nov-21	10-Nov-21	10-Nov-21
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	01-Dec-21/O	312	265	279	252	
Conductivity @25°C	µmho/cm	1	SM 2510B	01-Dec-21/O	582	521	542	487	
pH @25°C	pH Units		SM 4500H	01-Dec-21/O	8.07	7.79	7.73	8.05	
Total Dissolved Solids	mg/L	3	SM 2540D	01-Dec-21/O	302	270	281	252	
Total Suspended Solids	mg/L	3	SM2540D	15-Nov-21/K	11			3650	
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-Jan-22/O		1.8	1.7		
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-21/K	< 3			< 3	
COD	mg/L	5	SM5220C	25-Nov-21/K	12	9	14	5	
Phenolics	mg/L	0.002	MOEE 3179	19-Nov-21/K	< 0.002	< 0.002	< 0.002	< 0.002	
Chloride	mg/L	0.5	SM4110C	20-Nov-21/O	2.2	2.9	2.7	2.8	
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	26-Nov-21/K	0.02	< 0.01	0.01	0.01	
Sulphate	mg/L	1	SM4110C	20-Nov-21/O	6	5	6	4	
Nitrite (N)	mg/L	0.05	SM4110C	20-Nov-21/O	< 0.05		< 0.05	< 0.05	
Nitrate (N)	mg/L	0.05	SM4110C	20-Nov-21/O	0.81	1.52	1.22	1.94	
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Dec-21/K	0.3		0.4	0.4	
Mercury	mg/L	0.00002	SM 3112 B	17-Nov-21/O	< 0.00002		< 0.00002	< 0.00002	
Hardness (as CaCO3)	mg/L	1	SM 3120	18-Nov-21/O	332	286	298	272	
Arsenic	mg/L	0.0001	EPA 200.8	02-Dec-21/O	0.0001		< 0.0001	< 0.0001	
Barium	mg/L	0.001	SM 3120	18-Nov-21/O	0.037	0.024	0.042	0.031	
Boron	mg/L	0.005	SM 3120	18-Nov-21/O	0.025	0.009	0.012	0.010	
Cadmium	mg/L	0.000015	EPA 200.8	02-Dec-21/O	< 0.000015		< 0.000015	< 0.000015	
Calcium	mg/L	0.02	SM 3120	18-Nov-21/O		111	114		
Chromium	mg/L	0.001	EPA 200.8	02-Dec-21/O	0.002		< 0.001	< 0.001	
Copper	mg/L	0.0001	EPA 200.8	02-Dec-21/O	0.0004		0.0006	0.0004	
Iron	mg/L	0.005	SM 3120	18-Nov-21/O	0.400	0.005	0.022	< 0.005	
Lead	mg/L	0.00002	EPA 200.8	02-Dec-21/O	< 0.00002		0.00003	< 0.00002	
Magnesium	mg/L	0.02	SM 3120	18-Nov-21/O		1.98	3.06		



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Michelle Dubien
 Lab Manager

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REPORT No. B21-37314 (i)

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Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
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Tel: 613-544-2001

Fax: 613-544-2770

DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 05-Jan-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW2-2	TW2-1	TW8-1	TW8-2
					Sample I.D.	Date Collected			
Manganese	mg/L	0.001	SM 3120	18-Nov-21/O	B21-37314-1	10-Nov-21		0.009	
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Dec-21/K	B21-37314-2	10-Nov-21	0.01	0.27	0.82
Potassium	mg/L	0.1	SM 3120	18-Nov-21/O	B21-37314-3	10-Nov-21		0.7	
Sodium	mg/L	0.2	SM 3120	18-Nov-21/O	B21-37314-4	10-Nov-21	2.7	2.7	
Zinc	mg/L	0.005	SM 3120	18-Nov-21/O			< 0.005	< 0.005	< 0.005
Benzene	µg/L	0.5	EPA 8260	19-Nov-21/R				< 0.5	
Dichlorobenzene, 1,4-	µg/L	0.5	EPA 8260	19-Nov-21/R				< 0.5	
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	19-Nov-21/R				< 5	
Toluene	µg/L	0.5	EPA 8260	19-Nov-21/R				< 0.5	
Vinyl Chloride	µg/L	0.2	EPA 8260	19-Nov-21/R				< 0.2	



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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW3-1	TW11-2	TW10-2	TW6-2
					Sample I.D.	10-Nov-21	10-Nov-21	10-Nov-21	10-Nov-21
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	01-Dec-21/O	B21-37314-5	564	295	652	343
Conductivity @25°C	µmho/cm	1	SM 2510B	01-Dec-21/O	B21-37314-6	1190	689	1260	783
pH @25°C	pH Units		SM 4500H	01-Dec-21/O	B21-37314-7	7.41	7.77	7.52	7.88
Total Dissolved Solids	mg/L	3	SM 2540D	01-Dec-21/O	B21-37314-8	640	358	683	411
Total Suspended Solids	mg/L	3	SM2540D	15-Nov-21/K			540	6400	56
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-Jan-22/O		21.0			
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-21/K			6	14	3
COD	mg/L	5	SM5220C	25-Nov-21/K		327	23	57	29
Phenolics	mg/L	0.002	MOEE 3179	19-Nov-21/K		< 0.002	< 0.002	< 0.002	< 0.002
Chloride	mg/L	0.5	SM4110C	20-Nov-21/O		22.0	18.2	27.1	24.4
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	26-Nov-21/K		21.0	1.76	8.02	0.10
Sulphate	mg/L	1	SM4110C	20-Nov-21/O		58	10	32	50
Nitrite (N)	mg/L	0.05	SM4110C	20-Nov-21/O			< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	20-Nov-21/O		< 0.05	9.39	< 0.05	1.01
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Dec-21/K			2.2	9.8	0.5
Mercury	mg/L	0.00002	SM 3112 B	17-Nov-21/O			< 0.00002	< 0.00002	< 0.00002
Hardness (as CaCO3)	mg/L	1	SM 3120	18-Nov-21/O		552	350	655	388
Arsenic	mg/L	0.0001	EPA 200.8	02-Dec-21/O			0.0002	0.0011	0.0002
Barium	mg/L	0.001	SM 3120	18-Nov-21/O		0.359	0.096	0.301	0.128
Boron	mg/L	0.005	SM 3120	18-Nov-21/O		0.298	0.062	0.532	0.218
Cadmium	mg/L	0.000015	EPA 200.8	02-Dec-21/O			< 0.000015	< 0.000015	< 0.000015
Calcium	mg/L	0.02	SM 3120	18-Nov-21/O		194			
Chromium	mg/L	0.001	EPA 200.8	02-Dec-21/O			< 0.001	< 0.001	< 0.001
Copper	mg/L	0.0001	EPA 200.8	02-Dec-21/O			0.0005	0.0004	0.0025
Iron	mg/L	0.005	SM 3120	18-Nov-21/O		112	1.13	20.3	0.011
Lead	mg/L	0.00002	EPA 200.8	02-Dec-21/O			0.00007	0.00011	< 0.00002
Magnesium	mg/L	0.02	SM 3120	18-Nov-21/O		16.2			



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 Lab Manager

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Tel: 613-544-2001

Fax: 613-544-2770

DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 05-Jan-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW3-1	TW11-2	TW10-2	TW6-2
					Sample I.D.	Date Collected			
Manganese	mg/L	0.001	SM 3120	18-Nov-21/O	B21-37314-5				
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Dec-21/K	B21-37314-6		0.17	0.29	0.04
Potassium	mg/L	0.1	SM 3120	18-Nov-21/O	B21-37314-7				
Sodium	mg/L	0.2	SM 3120	18-Nov-21/O	B21-37314-8	21.2			
Zinc	mg/L	0.005	SM 3120	18-Nov-21/O			< 0.005	< 0.005	< 0.005
Benzene	µg/L	0.5	EPA 8260	19-Nov-21/R					
Dichlorobenzene,1,4-	µg/L	0.5	EPA 8260	19-Nov-21/R					
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	19-Nov-21/R					
Toluene	µg/L	0.5	EPA 8260	19-Nov-21/R					
Vinyl Chloride	µg/L	0.2	EPA 8260	19-Nov-21/R					



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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	GW_QAQC3	TW6-1	TW4-1	GW_QAQC3
					Sample I.D.	B21-37314-9	B21-37314-10	B21-37314-11	B21-37314-12
Date Collected					10-Nov-21	10-Nov-21	10-Nov-21	10-Nov-21	
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	01-Dec-21/O	342	392	272	271	
Conductivity @25°C	µmho/cm	1	SM 2510B	01-Dec-21/O	771	882	564	565	
pH @25°C	pH Units		SM 4500H	01-Dec-21/O	7.91	7.57	7.89	7.85	
Total Dissolved Solids	mg/L	3	SM 2540D	01-Dec-21/O	404	467	292	293	
Total Suspended Solids	mg/L	3	SM2540D	15-Nov-21/K	64				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-Jan-22/O		4.2	2.3	2.2	
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-21/K	< 3				
COD	mg/L	5	SM5220C	25-Nov-21/K	22	16	20	13	
Phenolics	mg/L	0.002	MOFF 3179	19-Nov-21/K	< 0.002	< 0.002	< 0.002	< 0.002	
Chloride	mg/L	0.5	SM4110C	20-Nov-21/O	24.4	27.3	5.6	5.5	
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	26-Nov-21/K	0.06	3.45	0.05	0.04	
Sulphate	mg/L	1	SM4110C	20-Nov-21/O	50	45	7	7	
Nitrite (N)	mg/L	0.05	SM4110C	20-Nov-21/O	< 0.05	0.07			
Nitrate (N)	mg/L	0.05	SM4110C	20-Nov-21/O	1.06	3.50	6.70	6.64	
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Dec-21/K	0.5	4.0			
Mercury	mg/L	0.00002	SM 3112 B	17-Nov-21/O	< 0.00002	< 0.00002			
Hardness (as CaCO3)	mg/L	1	SM 3120	18-Nov-21/O	399	443	312	309	
Arsenic	mg/L	0.0001	EPA 200.8	02-Dec-21/O	0.0002	< 0.0001			
Barium	mg/L	0.001	SM 3120	18-Nov-21/O	0.132	0.301	0.024	0.024	
Boron	mg/L	0.005	SM 3120	18-Nov-21/O	0.220	0.136	0.011	0.009	
Cadmium	mg/L	0.000015	EPA 200.8	02-Dec-21/O	< 0.000015	0.000024			
Calcium	mg/L	0.02	SM 3120	18-Nov-21/O		160	121	120	
Chromium	mg/L	0.001	EPA 200.8	02-Dec-21/O	< 0.001	< 0.001			
Copper	mg/L	0.0001	EPA 200.8	02-Dec-21/O	0.0024	0.0011			
Iron	mg/L	0.005	SM 3120	18-Nov-21/O	0.007	0.026	0.006	0.006	
Lead	mg/L	0.00002	EPA 200.8	02-Dec-21/O	< 0.00002	0.00008			



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P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	GW_QAQC3	TW6-1	TW4-1	GW_QAQC3
Sample I.D.	B21-37314-9	B21-37314-10	B21-37314-11	B21-37314-12
Date Collected	10-Nov-21	10-Nov-21	10-Nov-21	10-Nov-21

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Magnesium	mg/L	0.02	SM 3120	18-Nov-21/O		10.5	2.19	2.17
Manganese	mg/L	0.001	SM 3120	18-Nov-21/O		1.39		
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Dec-21/K	0.04	0.03		
Potassium	mg/L	0.1	SM 3120	18-Nov-21/O		7.4		
Sodium	mg/L	0.2	SM 3120	18-Nov-21/O		20.3	2.7	2.7
Zinc	mg/L	0.005	SM 3120	18-Nov-21/O	< 0.005	< 0.005		
Benzene	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5		
Dichlorobenzene,1,4-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5		
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	19-Nov-21/R		< 5		
Toluene	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5		
Vinyl Chloride	µg/L	0.2	EPA 8260	19-Nov-21/R		< 0.2		



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 Lab Manager

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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW5-1	TW5-2	TW7-1	TW7-2
					Sample I.D.	B21-37314-13	B21-37314-14	B21-37314-15	B21-37314-16
Date Collected					10-Nov-21	10-Nov-21	10-Nov-21	10-Nov-21	10-Nov-21
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	01-Dec-21/O	496	516	247	357	
Conductivity @25°C	µmho/cm	1	SM 2510B	01-Dec-21/O	2690	3750	522	1620	
pH @25°C	pH Units		SM 4500H	01-Dec-21/O	7.63	7.83	7.85	7.87	
Total Dissolved Solids	mg/L	3	SM 2540D	01-Dec-21/O	1500	2110	270	888	
Total Suspended Solids	mg/L	3	SM2540D	15-Nov-21/K		37		44	
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-Jan-22/O	7.2		2.8		
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-21/K		< 3		< 3	
COD	mg/L	5	SM5220C	25-Nov-21/K	38	35	12	32	
Phenolics	mg/L	0.002	MOFF 3179	19-Nov-21/K	< 0.002	< 0.002	< 0.002	< 0.002	
Chloride	mg/L	0.5	SM4110C	20-Nov-21/O	157	149	14.5	138	
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	26-Nov-21/K	1.34	0.04	0.01	0.16	
Sulphate	mg/L	1	SM4110C	20-Nov-21/O	1010	1910	16	360	
Nitrite (N)	mg/L	0.05	SM4110C	20-Nov-21/O		0.24	< 0.05	< 0.05	
Nitrate (N)	mg/L	0.05	SM4110C	20-Nov-21/O	< 0.05	6.04	< 0.05	< 0.05	
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Dec-21/K		1.2	0.2	0.4	
Mercury	mg/L	0.00002	SM 3112 B	17-Nov-21/O		< 0.00002	< 0.00002	< 0.00002	
Hardness (as CaCO3)	mg/L	1	SM 3120	18-Nov-21/O	1500	2160	273	681	
Arsenic	mg/L	0.0001	EPA 200.8	02-Dec-21/O		0.0004	0.0002	0.0017	
Barium	mg/L	0.001	SM 3120	18-Nov-21/O	0.029	0.027	0.188	0.100	
Boron	mg/L	0.005	SM 3120	18-Nov-21/O	4.07	9.40	0.041	1.56	
Cadmium	mg/L	0.000015	EPA 200.8	02-Dec-21/O		< 0.000029	< 0.000015	< 0.000015	
Calcium	mg/L	0.02	SM 3120	18-Nov-21/O	449		101		
Chromium	mg/L	0.001	EPA 200.8	02-Dec-21/O		< 0.001	< 0.001	< 0.001	
Copper	mg/L	0.0001	EPA 200.8	02-Dec-21/O		0.0085	0.0004	0.0001	
Iron	mg/L	0.005	SM 3120	18-Nov-21/O	3.89	0.052	0.353	5.58	
Lead	mg/L	0.00002	EPA 200.8	02-Dec-21/O		< 0.00009	0.00003	< 0.00004	



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C.O.C.: G100969

REPORT No. B21-37314 (i)

Report To:

Cambium Environmental
 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1
 Tel: 613-544-2001
 Fax: 613-544-2770

DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 05-Jan-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW5-1	TW5-2	TW7-1	TW7-2
					Sample I.D.	Date Collected			
Magnesium	mg/L	0.02	SM 3120	18-Nov-21/O	B21-37314-13	91.4		4.91	
Manganese	mg/L	0.001	SM 3120	18-Nov-21/O	B21-37314-14			0.011	
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Dec-21/K	B21-37314-15		0.04	< 0.01	0.03
Potassium	mg/L	0.1	SM 3120	18-Nov-21/O				1.2	
Sodium	mg/L	0.2	SM 3120	18-Nov-21/O		132		8.9	
Zinc	mg/L	0.005	SM 3120	18-Nov-21/O			< 0.005	< 0.005	< 0.005
Benzene	µg/L	0.5	EPA 8260	19-Nov-21/R				< 0.5	
Dichlorobenzene,1,4-	µg/L	0.5	EPA 8260	19-Nov-21/R				< 0.5	
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	19-Nov-21/R				< 5	
Toluene	µg/L	0.5	EPA 8260	19-Nov-21/R				< 0.5	
Vinyl Chloride	µg/L	0.2	EPA 8260	19-Nov-21/R				< 0.2	



Michelle Dubien
 Lab Manager

R.L. = Reporting Limit

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 05-Jan-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.		Date Collected	
					TW9-1	TW9-2	10-Nov-21	10-Nov-21
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	01-Dec-21/O	256	256		
Conductivity @25°C	µmho/cm	1	SM 2510B	01-Dec-21/O	511	512		
pH @25°C	pH Units		SM 4500H	01-Dec-21/O	7.90	8.00		
Total Dissolved Solids	mg/L	3	SM 2540D	01-Dec-21/O	265	265		
Total Suspended Solids	mg/L	3	SM2540D	15-Nov-21/K		1070		
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	01-Jan-22/O	2.0			
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-21/K		4		
COD	mg/L	5	SM5220C	25-Nov-21/K	7	71		
Phenolics	mg/L	0.002	MOFF 3179	19-Nov-21/K	< 0.002	< 0.002		
Chloride	mg/L	0.5	SM4110C	20-Nov-21/O	10.0	6.2		
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	26-Nov-21/K	0.02	0.26		
Sulphate	mg/L	1	SM4110C	20-Nov-21/O	16	16		
Nitrite (N)	mg/L	0.05	SM4110C	20-Nov-21/O	< 0.05	< 0.05		
Nitrate (N)	mg/L	0.05	SM4110C	20-Nov-21/O	< 0.05	0.16		
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Dec-21/K	0.1	1.7		
Mercury	mg/L	0.00002	SM 3112 B	17-Nov-21/O	< 0.00002	< 0.00002		
Hardness (as CaCO3)	mg/L	1	SM 3120	18-Nov-21/O	271	260		
Arsenic	mg/L	0.0001	EPA 200.8	02-Dec-21/O	< 0.0001	0.0002		
Barium	mg/L	0.001	SM 3120	18-Nov-21/O	0.110	0.259		
Boron	mg/L	0.005	SM 3120	18-Nov-21/O	0.023	0.012		
Cadmium	mg/L	0.000015	EPA 200.8	02-Dec-21/O	< 0.000015	< 0.000015		
Calcium	mg/L	0.02	SM 3120	18-Nov-21/O	101			
Chromium	mg/L	0.001	EPA 200.8	02-Dec-21/O	< 0.001	0.001		
Copper	mg/L	0.0001	EPA 200.8	02-Dec-21/O	0.0005	0.0019		
Iron	mg/L	0.005	SM 3120	18-Nov-21/O	0.015	< 0.005		
Lead	mg/L	0.00002	EPA 200.8	02-Dec-21/O	0.00003	0.00047		



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Michelle Dubien
 Lab Manager

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DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 05-Jan-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	TW9-1	TW9-2		
Sample I.D.	B21-37314-17	B21-37314-18		
Date Collected	10-Nov-21	10-Nov-21		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Magnesium	mg/L	0.02	SM 3120	18-Nov-21/O	4.62			
Manganese	mg/L	0.001	SM 3120	18-Nov-21/O	0.012			
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Dec-21/K	< 0.01	0.64		
Potassium	mg/L	0.1	SM 3120	18-Nov-21/O	1.0			
Sodium	mg/L	0.2	SM 3120	18-Nov-21/O	6.9			
Zinc	mg/L	0.005	SM 3120	18-Nov-21/O	< 0.005	< 0.005		
Benzene	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5			
Dichlorobenzene,1,4-	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5			
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	19-Nov-21/R	< 5			
Toluene	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5			
Vinyl Chloride	µg/L	0.2	EPA 8260	19-Nov-21/R	< 0.2			



Michelle Dubien
 Lab Manager

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DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 05-Jan-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	TW2-2	TW6-2	GW_QAQC3
					Sample I.D.			
					Date Collected	10-Nov-21	10-Nov-21	10-Nov-21
Acetone	µg/L	30	EPA 8260	19-Nov-21/R		< 30	< 30	< 30
Benzene	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Bromodichloromethane	µg/L	2	EPA 8260	19-Nov-21/R		< 2	< 2	< 2
Bromoform	µg/L	5	EPA 8260	19-Nov-21/R		< 5	< 5	< 5
Bromomethane	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	EPA 8260	19-Nov-21/R		< 0.2	< 0.2	< 0.2
Chloroethane	µg/L	3	EPA 8260	19-Nov-21/R		< 3	< 3	< 3
Chloroform	µg/L	1	EPA 8260	19-Nov-21/R		< 1	< 1	< 1
Chloromethane	µg/L	2	EPA 8260	19-Nov-21/R		< 2	< 2	< 2
Dibromochloromethane	µg/L	2	EPA 8260	19-Nov-21/R		< 2	< 2	< 2
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	EPA 8260	19-Nov-21/R		< 0.2	< 0.2	< 0.2
Dichlorobenzene, 1,2-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,3-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Dichlorobenzene, 1,4-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	EPA 8260	19-Nov-21/R		< 2	< 2	< 2
Dichloroethane, 1,1-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Dichloroethane, 1,2-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Dichloroethylene, 1,1-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Dichloroethene, cis-1,2-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Dichloroethene, trans-1,2-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	19-Nov-21/R		< 5	< 5	< 5
Dichloropropane, 1,2-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Dichloropropene 1,3- cis+trans	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5
Dichloropropene, 1,1-	µg/L	0.2	EPA 8260	19-Nov-21/R		< 0.2	< 0.2	< 0.2
Dichloropropene, trans-1,3-	µg/L	0.5	EPA 8260	19-Nov-21/R		< 0.5	< 0.5	< 0.5



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Michelle Dubien
 Lab Manager

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REPORT No. B21-37314 (ii)

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 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1

Tel: 613-544-2001

Fax: 613-544-2770

DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 05-Jan-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	TW2-2	TW6-2	GW_QAQC3
Sample I.D.	B21-37314-1	B21-37314-8	B21-37314-9
Date Collected	10-Nov-21	10-Nov-21	10-Nov-21

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Dichloropropene, cis-1,3-	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Ethylbenzene	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Hexane	µg/L	5	EPA 8260	19-Nov-21/R	< 5	< 5	< 5	
Xylene, m,p-	µg/L	1.0	EPA 8260	19-Nov-21/R	< 1.0	< 1.0	< 1.0	
Methyl Ethyl Ketone	µg/L	20	EPA 8260	19-Nov-21/R	< 20	< 20	< 20	
Methyl Isobutyl Ketone	µg/L	20	EPA 8260	19-Nov-21/R	< 20	< 20	< 20	
Methyl-t-butyl Ether	µg/L	2	EPA 8260	19-Nov-21/R	< 2	< 2	< 2	
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Xylene, o-	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Styrene	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Tetrachloroethane,1,1,1,2-	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Tetrachloroethane,1,1,2,2-	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Tetrachloroethylene	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Toluene	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Trichloroethane,1,1,1-	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Trichloroethane,1,1,2-	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Trichloroethylene	µg/L	0.5	EPA 8260	19-Nov-21/R	< 0.5	< 0.5	< 0.5	
Trichlorofluoromethane	µg/L	5	EPA 8260	19-Nov-21/R	< 5	< 5	< 5	
Trimethylbenzene,1,3,5-	µg/L	0.1	EPA 8260	19-Nov-21/R	< 0.1	< 0.1	< 0.1	
Vinyl Chloride	µg/L	0.2	EPA 8260	19-Nov-21/R	< 0.2	< 0.2	< 0.2	
Xylene, m,p,o-	µg/L	1.1	EPA 8260	19-Nov-21/R	< 1.1	< 1.1	< 1.1	



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Michelle Dubien
 Lab Manager

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C.O.C.: G100970

REPORT No. B21-37311

Rev. 2

Report To:

Cambium Environmental
 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1
 Tel: 613-544-2001
 Fax: 613-544-2770

DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 30-Mar-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

Client I.D.	SW-6	SW-3	SW-8	SW-1
Sample I.D.	B21-37311-1	B21-37311-2	B21-37311-3	B21-37311-4
Date Collected	10-Nov-21	10-Nov-21	10-Nov-21	10-Nov-21

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	SW-6	SW-3	SW-8	SW-1
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	30-Nov-21/O	355	209	191	203
Conductivity @25°C	µmho/cm	1	SM 2510B	30-Nov-21/O	832	800	417	458
pH @25°C	pH Units		SM 4500H	30-Nov-21/O	8.08	7.72	7.76	7.79
Total Dissolved Solids	mg/L	3	SM 2540D	01-Dec-21/O	438	420	215	237
Total Suspended Solids	mg/L	3	SM2540D	15-Nov-21/K	62	26	6	6
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-21/K	3	< 3	< 3	< 3
COD	mg/L	5	SM5220C	25-Nov-21/K	58	46	45	32
Phenolics	mg/L	0.001	MOEE 3179	19-Nov-21/K	< 0.001	< 0.001	< 0.001	< 0.001
Chloride	mg/L	0.5	SM4110C	20-Nov-21/O	26.4	80.3	14.5	17.2
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	25-Nov-21/K	0.07	0.04	0.03	0.02
Ammonia (N)-unionized	mg/L	0.01	CALC	25-Nov-21/K	< 0.01	< 0.01	< 0.01	< 0.01
Sulphate	mg/L	1	SM4110C	20-Nov-21/O	46	67	1	9
Nitrite (N)	mg/L	0.05	SM4110C	20-Nov-21/O	< 0.05	< 0.05	< 0.05	< 0.05
Nitrate (N)	mg/L	0.05	SM4110C	20-Nov-21/O	0.60	< 0.05	< 0.05	< 0.05
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	09-Dec-21/K	1.4	0.7	0.6	0.5
Mercury	mg/L	0.00002	SM 3112 B	16-Nov-21/O	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Hardness (as CaCO3)	mg/L	1	SM 3120	17-Nov-21/O	390	316	209	224
Arsenic	mg/L	0.0001	EPA 200.8	25-Nov-21/O	0.0006	0.0008	0.0004	0.0003
Barium	mg/L	0.001	SM 3120	17-Nov-21/O	0.085	0.062	0.064	0.060
Boron	mg/L	0.005	SM 3120	17-Nov-21/O	0.183	0.287	0.007	0.009
Cadmium	mg/L	0.000015	EPA 200.8	25-Nov-21/O	0.000033	0.000016	< 0.000015	< 0.000015
Calcium	mg/L	0.02	SM 3120	17-Nov-21/O	139	113	79.6	85.4
Chromium	mg/L	0.001	EPA 200.8	25-Nov-21/O	< 0.001	< 0.001	< 0.001	< 0.001
Copper	mg/L	0.0001	EPA 200.8	25-Nov-21/O	0.0024	0.0015	0.0003	0.0004
Iron	mg/L	0.005	SM 3120	17-Nov-21/O	0.256	0.181	0.257	0.125
Lead	mg/L	0.00002	EPA 200.8	25-Nov-21/O	0.00210	0.00041	0.00034	0.00072
Magnesium	mg/L	0.02	SM 3120	17-Nov-21/O	10.4	8.10	2.46	2.49



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 Lab Manager

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JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 30-Mar-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	SW-6	SW-3	SW-8	SW-1
					Sample I.D.	B21-37311-1	B21-37311-2	B21-37311-3	B21-37311-4
Date Collected					10-Nov-21	10-Nov-21	10-Nov-21	10-Nov-21	10-Nov-21
Manganese	mg/L	0.001	SM 3120	17-Nov-21/O	0.466	0.083	0.084	0.015	
Phosphorus-Total	mg/L	0.01	E3516.2	09-Dec-21/K	0.07	0.08	0.03	0.05	
Potassium	mg/L	0.1	SM 3120	17-Nov-21/O	12.2	9.0	0.2	0.3	
Sodium	mg/L	0.2	SM 3120	17-Nov-21/O	16.9	34.7	8.7	9.6	
Zinc	mg/L	0.005	SM 3120	17-Nov-21/O	0.015	0.017	0.011	0.013	

1. Revised to include additional parameters



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DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 30-Mar-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

Client I.D.	SW_QAQC		
Sample I.D.	B21-37311-5		
Date Collected	10-Nov-21		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	30-Nov-21/O	203		
Conductivity @25°C	µmho/cm	1	SM 2510B	30-Nov-21/O	461		
pH @25°C	pH Units		SM 4500H	30-Nov-21/O	7.75		
Total Dissolved Solids	mg/L	3	SM 2540D	01-Dec-21/O	238		
Total Suspended Solids	mg/L	3	SM2540D	15-Nov-21/K	4		
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-21/K	< 3		
COD	mg/L	5	SM5220C	25-Nov-21/K	35		
Phenolics	mg/L	0.001	MOEE 3179	19-Nov-21/K	< 0.001		
Chloride	mg/L	0.5	SM4110C	20-Nov-21/O	17.6		
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	25-Nov-21/K	0.02		
Ammonia (N)-unionized	mg/L	0.01	CALC	25-Nov-21/K	< 0.01		
Sulphate	mg/L	1	SM4110C	20-Nov-21/O	2		
Nitrite (N)	mg/L	0.05	SM4110C	20-Nov-21/O	< 0.05		
Nitrate (N)	mg/L	0.05	SM4110C	20-Nov-21/O	< 0.05		
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	09-Dec-21/K	0.4		
Mercury	mg/L	0.00002	SM 3112 B	16-Nov-21/O	< 0.00002		
Hardness (as CaCO3)	mg/L	1	SM 3120	17-Nov-21/O	220		
Arsenic	mg/L	0.0001	EPA 200.8	25-Nov-21/O	0.0003		
Barium	mg/L	0.001	SM 3120	17-Nov-21/O	0.060		
Boron	mg/L	0.005	SM 3120	17-Nov-21/O	0.009		
Cadmium	mg/L	0.000015	EPA 200.8	25-Nov-21/O	< 0.000015		
Calcium	mg/L	0.02	SM 3120	17-Nov-21/O	84.1		
Chromium	mg/L	0.001	EPA 200.8	25-Nov-21/O	< 0.001		
Copper	mg/L	0.0001	EPA 200.8	25-Nov-21/O	0.0005		
Iron	mg/L	0.005	SM 3120	17-Nov-21/O	0.117		
Lead	mg/L	0.00002	EPA 200.8	25-Nov-21/O	0.00058		
Magnesium	mg/L	0.02	SM 3120	17-Nov-21/O	2.42		



R.L. = Reporting Limit

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

Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

Michelle Dubien
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: G100970

REPORT No. B21-37311

Rev. 2

Report To:

Cambium Environmental
 194 Sophia St.,
 Peterborough ON K9H 1E5 Canada

Attention: Cameron MacDougall

Caduceon Environmental Laboratories

285 Dalton Ave
 Kingston Ontario K7K 6Z1
 Tel: 613-544-2001
 Fax: 613-544-2770

DATE RECEIVED: 12-Nov-21

JOB/PROJECT NO.: Stoney Lake WDS

DATE REPORTED: 30-Mar-22

P.O. NUMBER: 12987-004

SAMPLE MATRIX: Surface Water

WATERWORKS NO.

Client I.D.	SW_QAQC			
Sample I.D.	B21-37311-5			
Date Collected	10-Nov-21			

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Manganese	mg/L	0.001	SM 3120	17-Nov-21/O	0.013		
Phosphorus-Total	mg/L	0.01	E3516.2	09-Dec-21/K	0.01		
Potassium	mg/L	0.1	SM 3120	17-Nov-21/O	0.3		
Sodium	mg/L	0.2	SM 3120	17-Nov-21/O	9.4		
Zinc	mg/L	0.005	SM 3120	17-Nov-21/O	0.014		

1. Revised to include additional parameters



R.L. = Reporting Limit

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

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Michelle Dubien
 Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from



Appendix F

Photographs

Fully accessible appended items are available upon request.



***Photograph 1: Monitors TW2-1 and TW2-2,
November 2021***



Photograph 2: Monitor TW3-1, November 2021



Photograph 3: Monitor TW4-1, November 2021



Photograph 4: Monitors TW5-1 and TW5-2, June 2021



***Photograph 5: Monitors TW6-1 and TW6-2,
November 2021***



***Photograph 6: Monitors TW7-1 and TW7-2,
November 2021***



***Photograph 7: Monitors TW8-1 and TW8-2,
November 2021***



***Photograph 8: Monitors TW9-1 and TW9-2,
November 2021***



Photograph 9: Monitors TW10-2, June 2021



Photograph 10: Monitors TW11-2, November 2021



***Photograph 11: Surface water station SW-1,
August 2021***



***Photograph 12: Surface water station SW-1,
August 2021***



***Photograph 13: Surface water station SW-1,
November 2021***



***Photograph 14: Dry - Surface water station SW-3,
June 2021***



***Photograph 15: Dry - Surface water station SW-3,
August 2021***



***Photograph 16: Surface water station SW-3,
November 2021***



*Photograph 17: Dry - Surface water station SW-6,
June 2021*



*Photograph 18: Dry - Surface water station SW-6,
August 2021*



*Photograph 19: Surface water station SW-6,
November 2021*



*Photograph 20: Dry - Surface water station SW-8,
August 2021*



***Photograph 21: Dry - Surface water station SW-8,
August 2021***



***Photograph 22: Surface water station SW-8,
November 2021***



Photograph 23: Gas Probe GP-1, November 2021



Photograph 24: Gas Probe GP-2, November 2021

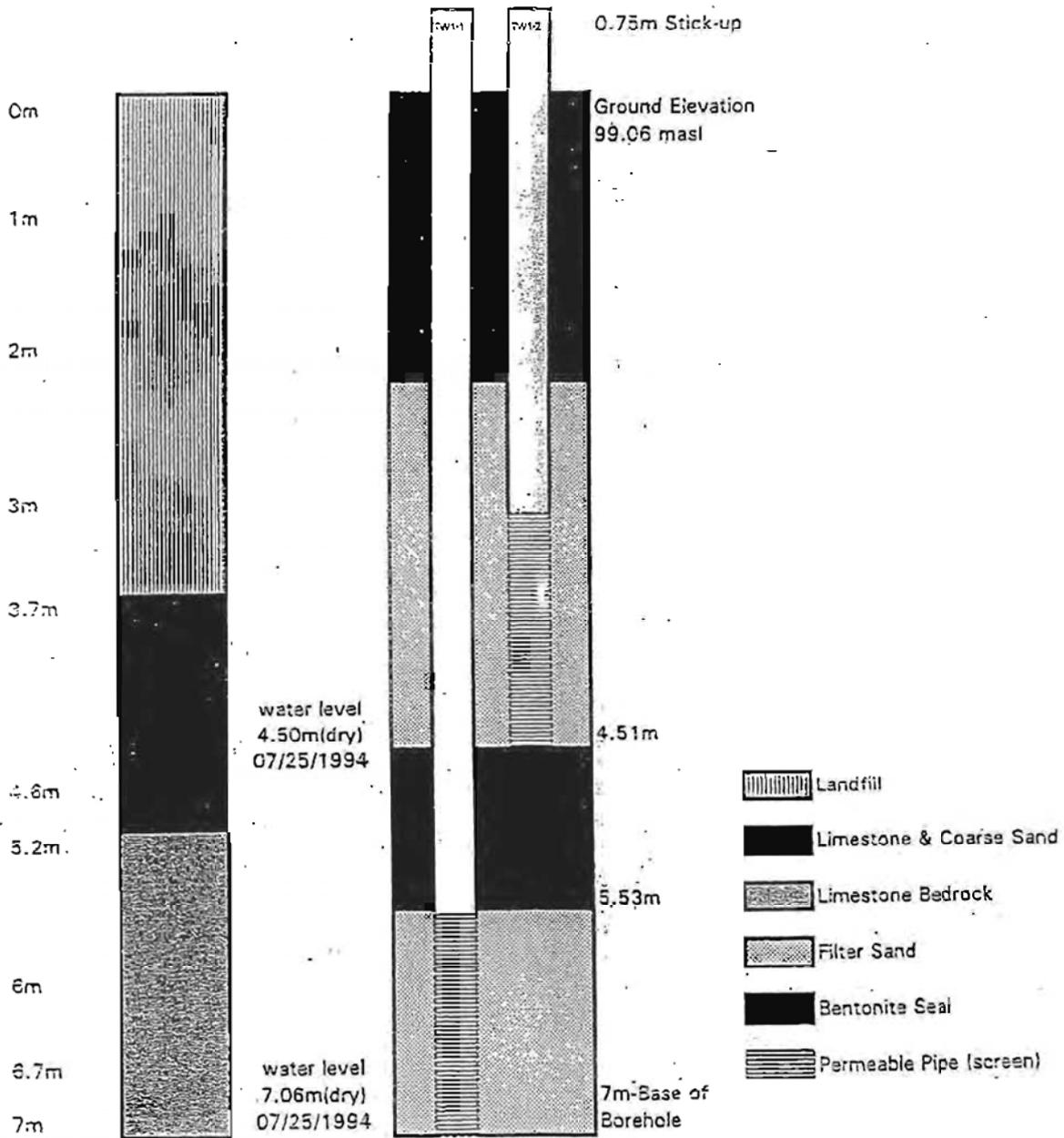


Appendix G

Borehole Logs

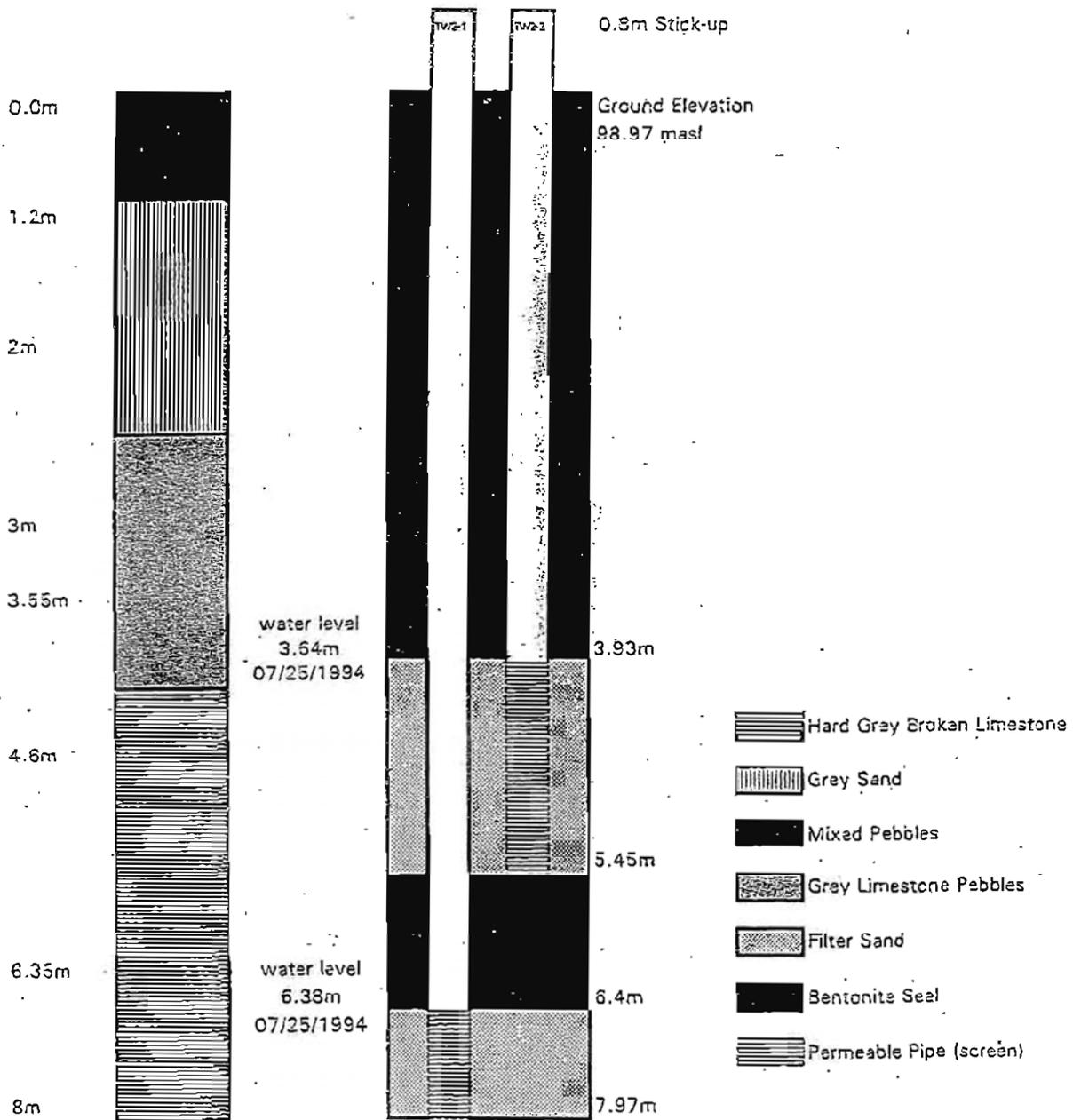
Fully accessible appended items are available upon request.

Well Log and As-Built Diagrams for TW1 @Stoney Lake Road Landfill (Douro North)
 7777-096
 Date Drilled: July 21 1994



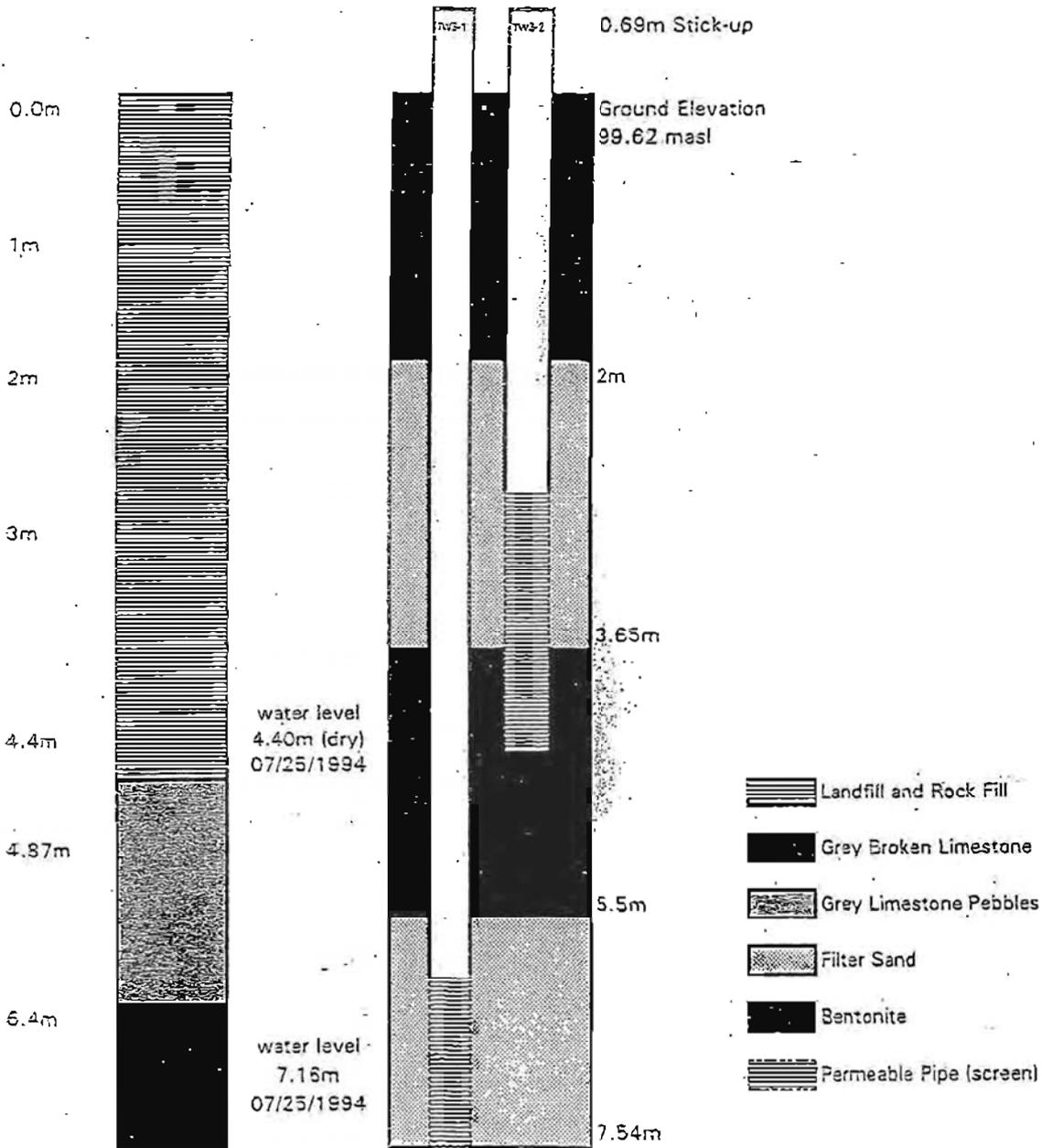
Not to Scale

Well Log and As-Built Diagrams for TW2 @Stoney Lake Road Landfill (Douro North)
 7777-096
 Date Drilled: July 21 1994



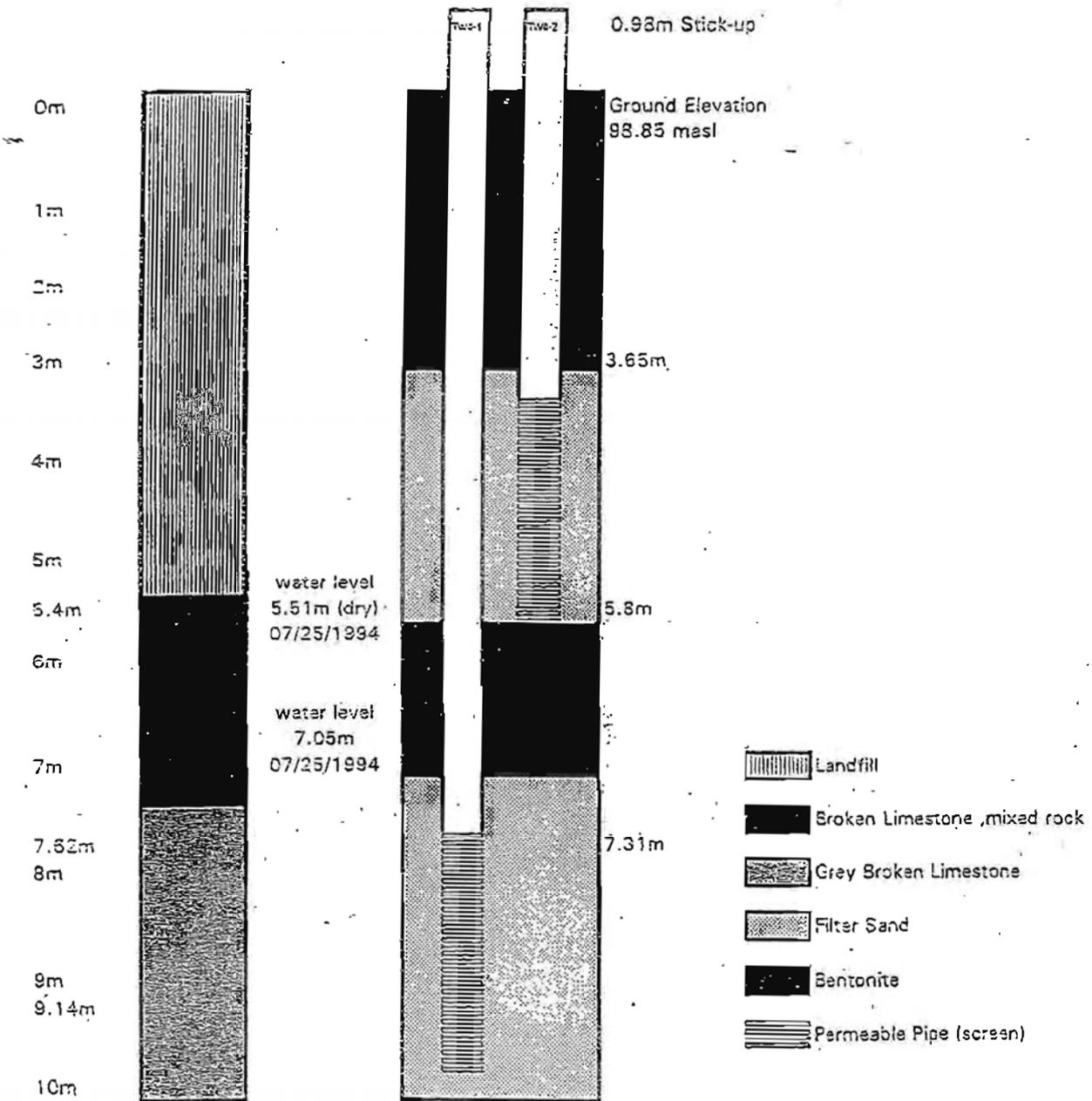
Not to Scale

Well Log and As-Built Diagrams for TW3 @Stoney Lake Road Landfill (Douro North)
 7777-096
 Data Drilled: July 21 1994



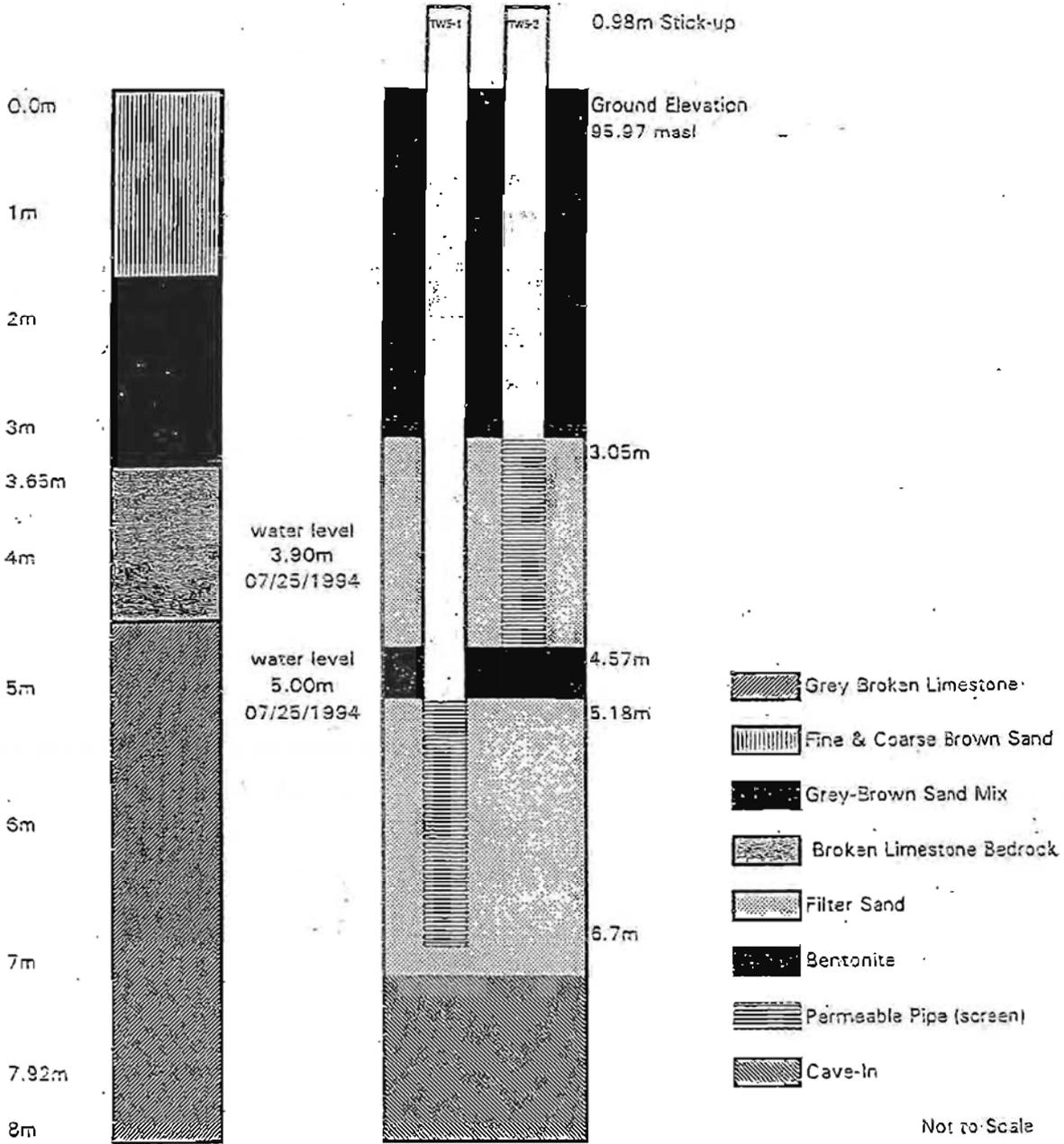
Not to Scale

Well Log and As-Built Diagrams for TW4 @Stoney Lake Road Landfill (Douro North)
 7777-096
 Date Drilled: July 21 1994



Not to Scale

Well Log and As-Built Diagrams for TW5 @Stoney Lake Road Landfill (Douro North)
 7777-096
 Date Drilled: July 21 1994



BOREHOLE LOG # TW 5-1		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No 7777-226	DATE DRILLED NOV 18, 1995	ELEVATION 95.258	SCALE NTS

DEPTH METERS	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	VALUE	
0		Organic	protective locking casing			Stick-up is 0.86m Water measurement taken after completion of well installation Wells were dedicated at completion of drilling with Waterra tubing and foot valves. Protective casing with lock was installed and cemented in place. 1-1/4" PVC schedule 80 pipe and screen was installed. Screen is 5' (1.52m) in length. 5.13m bottom of hole
1		SAND loose brown	cement			
2			bentonite			
3			native fill			
4		BEDROCK fractured limestone	bentonite			
5			filter sand			
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
15						
17						
18						
19						

	LAKFIELD RESEARCH LIMITED ENVIRONMENTAL SERVICES	185 CONCESSION STREET LAKEFIELD, ONTARIO, CANADA 21, 1st AVENUE SCHUMACHER, ONTARIO, CANADA
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BOREHOLE LOG # TW 8-2

PROJECT NAME
DOURO NORTH LANDFILL SITE

LOGGED BY
D. BUCHOLTZ

DRILLING METHOD
AUGERS

PROJECT No
7777-225

DATE DRILLED
NOV 17, 1995

ELEVATION
95.024

SCALE
NTS

DEPTH METERS	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0			protective locking casing			Stick-up is 0.87m
0.87		Organic	cement bentonite			Water measurement taken after completion of well installation
1.5		SAND loose brown				Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3.5		BEDROCK fractured limestone	native fill			Protective casing with lock was installed and cemented in place.
4.5						2" PVC schedule 80 pipe and screen was installed.
5.5						Screen is 5' (1.52m) in length.
9.0						3.35m bottom of hole
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						



185 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA
21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

BOREHOLE LOG # TW 7-1

PROJECT NAME
DOURO NORTH LANDFILL SITE

LOGGED BY
D. BUCHOLTZ

DRILLING METHOD
AUGERS

PROJECT No
7777-225

DATE DRILLED
NOV 20, 1995

ELEVATION
94.315

SCALE
NTS

DEPTH METERS	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS		SAMPLE		COMMENTS
					TYPE	N VALUE	
0			protective locking casing				Stick-up is 0.92m
0		Organic	cement bentonite				Water measurement taken after completion of well installation
1		SAND dark brown with Organics					Wells were dedicated at completion of drilling with Waterloo tubing and foot valves.
1		Silt compact grey					
2							
2		SAND grey wet loose					
3			native fill				Protective casing with lock was installed and cemented in place.
4							
5							
6							1 1/4" PVC schedule 80 pipe and screen was installed.
6			bentonite				Screen is 5" (1.52m) in length.
7		BEDROCK fractured limestone					
8							
8			filter sand				9.25m bottom of hole
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							

LAKEFIELD RESEARCH LIMITED
ENVIRONMENTAL SERVICES

185 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA
21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

BOREHOLE LOG # TW 7-2		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No 7777-225	DATE DRILLED NOV 20, 1995	ELEVATION 94.395	SCALE NTS

DEPTH METERS	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0		Organic	protective locking casing			Stick-up is 1.02m
0.5		SAND dark brown with Organics	cement			Water measurement taken after completion of well installation
1		Silt compact grey	bentonite			Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
2		SAND gray wet loose	filter sand			Protective casing with lock was installed and cemented in place.
3						2" PVC schedule 80 pipe and screen was installed.
4						Screen is 5' (1.52m) in length.
5		BEDROCK fractured limestone				4.27m bottom of hole
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

 LAKEFIELD RESEARCH LIMITED ENVIRONMENTAL SERVICES	135 CONCESSION STREET LAKEFIELD, ONTARIO, CANADA
	21, 1st AVENUE SCHUMACHER, ONTARIO, CANADA

BOREHOLE LOG # TW 8-1		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No .7777-225	DATE DRILLED NOV 30, 1995	ELEVATION 100.094	SCALE NTS

DEPTH METERS	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0		Organic	protective locking casing			Stick-up is 1.35m
1		CLAY dark brown	cement bentonite			Water measurement taken after completion of well installation
2		SAND grey with GRAVEL	native fill			Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3			bentonite			Protective casing with lock was installed and cemented in place.
4			native fill			1 1/4" PVC schedule 80 pipe and screen was installed.
5						Screen is 5' (1.52m) in length.
6		BEDROCK fractured limestone				
7			bentonite			
8						
9			filter sand			10.97m bottom of hole
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

 LAKEFIELD RESEARCH LIMITED ENVIRONMENTAL SERVICES	135 CONCESSION STREET LAKEFIELD, ONTARIO, CANADA
	21, 1st AVENUE SCHUMACHER, ONTARIO, CANADA

BOREHOLE LOG # TW 8-2	PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
	DRILLING METHOD AUGERS	PROJECT No 7777-226	DATE DRILLED NOV. 30, 1995	ELEVATION 100.094

DEPTH METERS	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0		Organic	protective locking casing			Stick-up is 1.33m
1		CLAY dark brown	cement bentonite			Water measurement taken after completion of well installation
2		SAND grey with GRAVEL				Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3			native fill			Protective casing with lock was installed and cemented in place.
4						2" PVC schedule 80 pipe and screen was installed.
5						Screen is 5' (1.52m) in length.
6		BEDROCK fractured limestone	bentonite			
7			filter sand			
8						4.32m bottom of hole
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						



135 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA
21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

BOREHOLE LOG

BH9-1

PROJECT NAME
TOWNSHIP OF DOURO
STONE LAKE ROAD LANDFILL

LOGGED BY D. BUCHOLTZ
LAKEFIELD RESEARCH LIMITED

DRILLING METHOD
HOLLOW STEM AUGER

PROJECT No
7777-371

DATE DRILLED
AUGUST 19, 1997

GROUND ELEV.
N/A

SCALE
NTS

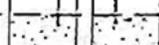
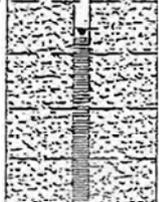
DEPTH METERS	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0			PROTECTIVE CASING			Drilling commenced 08:00hrs, Aug 19/97
0.5			CEMENT			Well instrumented with dedicated inertio pump upon completion.
1.0		ORGANIC, overburden				TWS-1 has 50MM PVC Schedule 40 riser pipe and 1.52m No.10 slotted screen
2.0		SILT, 17% clay, wet				
3.0			BENTONITE			
4.0						
5.0						
6.0		BEDROCK, limestone				
7.0						
8.0			SILICA SAND			Water was encountered @ 8.84m (29ft) below grade.
9.0						Bottom of hole at 9.60m (31.5ft) below grade.

LAKEFIELD RESEARCH LIMITED
ENVIRONMENTAL SERVICES

185 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA

21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

BOREHOLE LOG # BH9-2	PROJECT NAME TOWNSHIP OF DOURO STONE LAKE ROAD LANDFILL		LOGGED BY D. BUCHOLTZ LAKEFIELD RESEARCH LIMITED	
	DRILLING METHOD HOLLOW STEM AUGER	PROJECT No 7777-371	DATE DRILLED AUGUST 19, 1997	GROUND ELEV. N/A

DEPTH METERS	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS		SAMPLE		COMMENTS
					TYPE	N VALUE	
0			PROTECTIVE CASING				Drilling commenced 13:30hrs. Aug 19/97
0.5			CEMENT				Well instrumented with dedicated inertia pump upon completion.
1		ORGANIC, overburden					TWS-2 has 50MM PVC Schedule 40 riser pipe and 1.52m No.10 slotted screen
2		SILT, fin. grey. w/	SILICA SAND				Water was encountered @ 1.83m (6ft) below grade.
3			BENTONITE				Bottom of hole at 3.51m (11.5ft) below grade.
4							
5							
6		BEDROCK, limestone					
7							
8							
9							



185 CONCESSION STREET
LAKEFIELD, ONTARIO, CANADA

21, 1st AVENUE
SCHUMACHER, ONTARIO, CANADA

Well Owner's Information

First Name: Eric Last Name / Organization: Dave Clifford Township of Deuro-Dummer E-mail Address: _____ Well Constructed by Well Owner

Mailing Address (Street Number/Name): 8094 South Street Municipality: Warsaw Province: ON Postal Code: K0H3A0 Telephone No. (inc. area code): _____

Well Location

Address of Well Location (Street Number/Name): 548 Deuro Dummer County Rd 6 Township: _____ Lot: _____ Concession: _____

County/District/Municipality: _____ City/Town/Village: Youngs Point Province: Ontario Postal Code: _____

UTM Coordinates: Zone: 17 Easting: 720852 Northing: 4976690 Municipal Plan and Sublot Number: _____

NAD: 83 Other: _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
<u>tan</u>	<u>GRAVEL</u>		<u>LOOSE</u>	<u>0</u>	<u>2</u>
<u>tan</u>	<u>SILT</u>	<u>CLAY</u>	<u>SOFT</u>	<u>2</u>	<u>6</u>
<u>clay</u>	<u>CLAY</u>	<u>SILT</u>	<u>SOFT</u>	<u>6</u>	<u>7</u>
<u>blk</u>	<u>FILL</u>		<u>SOFT</u>	<u>7</u>	<u>12</u>

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From	To	
<u>0</u>	<u>6</u> <u>BENTONITE</u>	
<u>6</u>	<u>12</u> <u>SAND</u>	

Results of Well Yield Testing

After test of well yield, water was:
 Clear and sand free
 Other, specify _____

If pumping discontinued, give reason: _____

Time (min)	Draw Down		Recovery	
	Water Level (m/ft)	Time (min)	Water Level (m/ft)	Time (min)
Static Level				
1		1		
Pump intake set at (m/ft)		2		
2		3		
Pumping rate (l/min / GPM)		4		
3		5		
Duration of pumping _____ hrs + _____ min		10		
Final water level end of pumping (m/ft)		15		
4		20		
If flowing give rate (l/min / GPM)		25		
5		30		
Recommended pump depth (m/ft)		40		
6		50		
Recommended pump rate (l/min / GPM)		60		
7				
Well production (l/min / GPM)				
8				
Disinfected? <input type="checkbox"/> Yes <input type="checkbox"/> No				

Method of Construction

Cable Tool Diamond Public Commercial Not used
 Rotary (Conventional) Jetting Domestic Municipal Dewatering
 Rotary (Reverse) Driving Livestock Test Hole Monitoring
 Boring Digging Irrigation Cooling & Air Conditioning
 Air percussion Industrial
 Other, specify Auger Other, specify _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fiberglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
	<u>PLASTIC</u>		<u>+3</u>	<u>7</u>	<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		Status of Well
			From	To	
<u>2</u>	<u>PLASTIC</u>	<u>10</u>	<u>7</u>	<u>12</u>	<input type="checkbox"/> Other, specify _____

Water Details

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Hole Diameter: Depth (m/ft) From To Diameter (cm/in)
		<u>0</u> <u>12</u> <u>6</u>

Well Contractor and Well Technician Information

Business Name of Well Contractor: Strata Soil Sampling Well Contractor's Licence No.: 71741

Business Address (Street Number/Name): 165 Shields Court Municipality: Markham

Province: ON Postal Code: H3H 0V2 Business E-mail Address: _____

Bus. Telephone No. (inc. area code): (905) 940-7919 Name of Well Technician (Last Name, First Name): Younis, Eric

Well Technician's Licence No.: 771/16 Signature of Technician and/or Contractor: _____ Date Submitted: 2015 01 23

Map of Well Location

Please provide a map below following instructions on the back.

SEE ATTACHED MAP (MW6)

Well owner's information package delivered: Yes No

Date Package Delivered: _____ Date Work Completed: 2014/12/12

Ministry Use Only
 Audit No: Z 200302
 Received: _____

Well Owner's information

First Name: ~~George~~ Last Name / Organization: Dave Clifford Township of Douro-Dummer E-mail Address: _____ Well Constructed by Well Owner

Mailing Address (Street Number/Name): 894 Smith Street Municipality: Warsaw Province: ON Postal Code: K0L3A0 Telephone No. (inc. area code): _____

Well Location

Address of Well Location (Street Number/Name): 348 Couzy Rd 6 Township: _____ Lot: _____ Concession: _____

County/District/Municipality: _____ City/Town/Village: Youngs Point Province: Ontario Postal Code: _____

UTM Coordinates: Zone: Easting: Northing: Municipal Plan and Sublot Number: Other: _____

NAD 83 17 720906 4926628

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
Brown	Soil	GRAVEL	LOOSE	0 1
Brown	SILT	CLAY	SOFT	1 6
Grey	CLAY	SILT	SOFT	6 7
Black	FILL			7 11

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From To		
0 5	RENOVATE	
5 11	SPUD	

Results of Well Yield Testing

Time (min)	Draw Down		Recovery	
	Water Level (m/ft)	Time (min)	Water Level (m/ft)	Time (min)
Static Level				
1		1		
2		2		
3		3		
4		4		
5		5		
10		10		
15		15		
20		20		
25		25		
30		30		
40		40		
50		50		
60		60		

Method of Construction

Cable Tool Diamond Public Commercial Not used

Rotary (Conventional) Jetting Domestic Municipal Dewatering

Rotary (Reverse) Driving Livestock Test Hole Monitoring

Boring Digging Irrigation Cooling & Air Conditioning

Air percussion Industrial Other, specify: _____

Other, specify: AUGER

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fiberglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	Status of Well
			From To	
	PLASTIC		10 6	<input checked="" type="checkbox"/> Water Supply
				<input type="checkbox"/> Replacement Well
				<input checked="" type="checkbox"/> Test Hole
				<input type="checkbox"/> Recharge Well
				<input type="checkbox"/> Dewatering Well
				<input checked="" type="checkbox"/> Observation and/or Monitoring Hole
				<input type="checkbox"/> Alteration (Construction)
				<input type="checkbox"/> Abandoned, Insufficient Supply
				<input type="checkbox"/> Abandoned, Poor Water Quality
				<input type="checkbox"/> Abandoned, other, specify: _____
				<input type="checkbox"/> Other, specify: _____

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)
			From To
2	PLASTIC	10	6 11

Water Details

Water found at Depth (m/ft) Gas Other, specify: _____ Kind of Water: Fresh Unlested

Water found at Depth (m/ft) Gas Other, specify: _____ Kind of Water: Fresh Unlested

Water found at Depth (m/ft) Gas Other, specify: _____ Kind of Water: Fresh Unlested

Map of Well Location

Please provide a map below following instructions on the back.

SEE ATTACHED MAP (MW5)

Well Contractor and Well Technician Information

Business Name of Well Contractor: Strata Soil Sampling Well Contractor's Licence No.: 27741

Business Address (Street Number/Name): 165 Shields Court Municipality: Markham

Province: ON Postal Code: L3R1G9 Business E-mail Address: _____

Bus. Telephone No. (inc. area code): (905) 940-7919 Name of Well Technician (Last Name, First Name): Steve Ernie

Well Technician's Licence No.: 27741 Signatures of Technician and/or Contractor: _____ Date Submitted: 2015/01/23

Ministry Use Only

Audit No. Z 200301

Well owner's information package delivered: Yes No

Date Package Delivered: _____ Date Work Completed: 2014/12/12

Received: _____

Well Owner's Information

First Name: ~~Scott~~ Dave Clifford Last Name / Organization: Township of Douro-Dummer Email Address: _____
 Mailing Address (Street Number/Name): 894 South Street Municipality: Narsaw Province: ON Postal Code: K10L3A0 Telephone No. (inc. area code): _____
 Well Constructed by Well Owner

Well Location

Address of Well Location (Street Number/Name): 398 County Rd 6 Township: _____ Lot: _____ Concession: _____
 County/District/Municipality: _____ City/Town/Village: Vowles Pt. Province: Ontario Postal Code: _____
 UTM Coordinates: Zone: Easting: Northing: _____
 NAD: 83 17 720 888 498 63 23 Municipal Plan and Sublot Number: _____ Other: _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BRN	TOP SOIL		LOOSE	0	2
BRN	SILT	CLAY	SOFT	2	3
GRY	LIMESTONE	PERMO	PEDROCK	3	10

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	4	REINFORCE	
4	10	SAND	

Results of Well Yield Testing

Time (min)	Draw Down		Recovery	
	Water Level (m/ft)	Time (min)	Water Level (m/ft)	Time (min)
1		1		
2		2		
3		3		
4		4		
5		5		
10		10		
15		15		
20		20		
25		25		
30		30		
40		40		
50		50		
60		60		

After test of well yield, water was:
 Clear and sand free
 Other, specify _____
 If pumping discontinued, give reason: _____
 Pump intake set at (m/ft): _____
 Pumping rate (l/min / GPM): _____
 Duration of pumping: _____ hrs + _____ min
 Final water level end of pumping (m/ft): _____
 If flowing give rate (l/min / GPM): _____
 Recommended pump depth (m/ft): _____
 Recommended pump rate (l/min / GPM): _____
 Well production (l/min / GPM): _____
 Disinfected? Yes No

Method of Construction

Cable Tool Diamond Public Commercial Not used
 Rotary (Conventional) Jetting Domestic Municipal Dewatering
 Rotary (Reverse) Driving Livestock Test Hole Monitoring
 Boring Digging Irrigation Cooling & Air Conditioning
 Air percussion Industrial
 Other, specify _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
	PLASTIC		+3	5	<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		Status of Well
			From	To	
2	PLASTIC	10	5	10	<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Water Details

Water found at Depth (m/ft)	Kind of Water:	Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0	3	5
	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	3	10	4.7
	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____			

Well Contractor and Well Technician Information

Business Name of Well Contractor: Strata Soil Sampling Well Contractor's Licence No.: 72145
 Business Address (Street Number/Name): 165 Shields Court Municipality: Markham
 Province: ON Postal Code: L3R1G0 Business E-mail Address: _____

Bus. Telephone No. (inc. area code): (905) 470-7919 Name of Well Technician (Last Name, First Name): JEFFREY CLIFFORD
 Well Technician's Licence No.: 21416 Signature of Technician and/or Contractor: [Signature] Date Submitted: 2015/11/23

Map of Well Location

Please provide a map below following instructions on the back.

SEE ATTACHED MAP (M3)

Comments: _____

Well owner's information package delivered: Yes No

Date Package Delivered: _____ Date Work Completed: 2014/12/12

Ministry Use Only
 Audit No. Z 200300
 Received: _____

Well Owner's Information

First Name: Clifford Last Name / Organization: Township of Douro-Dummer E-mail Address: _____ Well Constructed by Well Owner
 Mailing Address (Street Number/Name): 894 South Street Municipality: Narsaw Province: ON Postal Code: K10L3A0 Telephone No. (inc. area code): _____

Well Location

Address of Well Location (Street Number/Name): 348 County Rd 6 Township: _____ Lot: _____ Concession: _____
 County/District/Municipality: _____ City/Town/Village: North York Province: **Ontario** Postal Code: _____
 UTM Coordinates: Zone: 17 Easting: 720761 Northing: 4921678 Municipal Plan and Sublot Number: _____ Other: _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
<u>Brown</u>	<u>Top Soil</u>		<u>Loose</u>	<u>0</u>	<u>0.2</u>
<u>Brown</u>	<u>Soil</u>	<u>Clay</u>	<u>Soft</u>	<u>2</u>	<u>8</u>
<u>Grey</u>	<u>Limestone</u>	<u>Bedrock</u>	<u>Bedrock</u>	<u>8</u>	<u>35</u>

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
<u>0</u> <u>24</u>	<u>Resin</u>	
<u>24</u> <u>35</u>	<u>Sand</u>	

Method of Construction

Cable Tool Diamond Public Commercial Not used
 Rotary (Conventional) Jetting Domestic Municipal Dewatering
 Rotary (Reverse) Driving Livestock Test Hole Monitoring
 Boring Digging Irrigation Cooling & Air Conditioning
 Air Percussion Industrial Other, specify _____
 Other, specify _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
			<u>+3</u>	<u>25</u>	<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To
<u>2</u>		<u>10</u>	<u>25</u>	<u>35</u>

Water Details

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Hole Diameter	
		Depth (m/ft)	Diameter (cm/in)
		<u>0</u> <u>8</u>	<u>5</u>
		<u>8</u> <u>35</u>	<u>3.5</u>

Well Contractor and Well Technician Information

Business Name of Well Contractor: Strata Soil Sampling Well Contractor's Licence No.: 7741
 Business Address (Street Number/Name): 165 Shields Court Municipality: Markham
 Province: ON Postal Code: M3R1R0R2 Business E-mail Address: _____

Bus. Telephone No. (inc. area code): 905-940-7919 Name of Well Technician (Last Name, First Name): FORREST ONE
 Well Technician's Licence No.: 77116 Signature of Technician and/or Contractor: _____ Date Submitted: 2015/10/23

Results of Well Yield Testing

After test of well yield, water was:
 Clear and sand free
 Other, specify _____

If pumping discontinued, give reason: _____

Pump intake set at (m/ft): _____

Pumping rate (l/min / GPM): _____

Duration of pumping: _____ hrs + _____ min

Final water level end of pumping (m/ft): _____

If flowing give rate (l/min / GPM): _____

Recommended pump depth (m/ft): _____

Recommended pump rate (l/min / GPM): _____

Well production (l/min / GPM): _____

Disinfected? Yes No

Static Level	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.

SEE ATTACHED MAP (TW-8D)

Comments: _____

Well owner's information package delivered: Yes No

Date Package Delivered: _____ Date Work Completed: 2015/10/23

Ministry Use Only
 Audit No. **Z 200305**
 Received: _____

Well Owner's Information

First Name: Dave Clifford Last Name / Organization: Township of Douro-Dummer E-mail Address: _____ Well Constructed by Well Owner

Mailing Address (Street Number/Name): 894 South Street Municipality: Warsaw Province: ON Postal Code: K0L1Z40 Telephone No. (inc. area code): _____

Well Location

Address of Well Location (Street Number/Name): 348 County Rd 6 Township: _____ Lot: _____ Concession: _____

County/District/Municipality: _____ City/Town/Village: Yolande Pt. Province: Ontario Postal Code: _____

UTM Coordinates: Zone: 17N Easting: 726765 Northing: 4926788 Municipal Plan and Sublot Number: _____ Other: _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
<u>BRN</u>	<u>TOP SOIL</u>		<u>LOOSE</u>	0 2
<u>BRN</u>	<u>SILT</u>	<u>CLAY</u>	<u>SOFT</u>	2 8
<u>GLY</u>	<u>LIMESTONE</u>		<u>BEDROCK</u>	8 15

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From To		
0 7	<u>BENTONITE</u>	
7 15	<u>SAND</u>	

Method of Construction

Cable Tool Diamond Public Commercial Not used

Rotary (Conventional) Jetting Domestic Municipal Dewatering

Rotary (Reverse) Driving Livestock TEST Hole Monitoring

Boring Digging Irrigation Cooling & Air Conditioning

Air percussion Industrial

Other, specify _____ Other, specify _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	Status of Well
			From To	
	<u>PLASTIC</u>		7 10	<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input checked="" type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)
			From To
2	<u>PLASTIC</u>	10	10 15

Water Details

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____
0	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____
8	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____

Hole Diameter

Depth (m/ft)	Diameter (cm/in)
From To	
0 8	5
8 15	3.5

Well Contractor and Well Technician Information

Business Name of Well Contractor: Shasta Soil Sampling Well Contractor's Licence No.: 7284

Business Address (Street Number/Name): 65 Shields Court Municipality: Markham

Province: ON Postal Code: L3R1G0A1 Business E-mail Address: _____

Bus. Telephone No. (inc. area code): (416) 490-7914 Name of Well Technician (Last Name, First Name): FOURCADE JONIC

Well Technician's Licence No.: 31716 Signature of Technician and/or Contractor: _____ Date Submitted: 2015/10/23

Results of Well Yield Testing

After test of well yield, water was: <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: Static Level	1		1	
	2		2	
	3		3	
	4		4	
	5		5	
	10		10	
If flowing give rate (l/min / GPM)	15		15	
	20		20	
	25		25	
	30		30	
	40		40	
	50		50	
60		60		

Pump intake set at (m/ft): _____

Pumping rate (l/min / GPM): _____

Duration of pumping: _____ hrs + _____ min

Final water level end of pumping (m/ft): _____

Recommended pump depth (m/ft): _____

Recommended pump rate (l/min / GPM): _____

Well production (l/min / GPM): _____

Disinfected? Yes No

Map of Well Location

Please provide a map below following instructions on the back.

SEE ATTACHED MAP (TW-8)

Well owner's information package delivered: Yes No

Date Package Delivered: _____

Date Work Completed: _____

Ministry Use Only
Audit No: Z 200304

Received: _____

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11

5117567

Municipality 51007 Con. CON 24

County or District: PETER BOROUGH
Township/Borough/City/Town/Village: DOURO
Con block tract survey, etc.: H Lot: 20
Owner's surname: TOWNSHIP OF DOURO
First name: DOURO
Address: DOURO ONT.
Date completed: 19 08 97

Zone Easting Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
BLACK	ORGANIC	PEAT		0	5.75
GREY	SILT	TILL	WET.	5.75	10.
	LIMESTONE	BEDROCK.	WEATHERED.	10	11.5

31
32

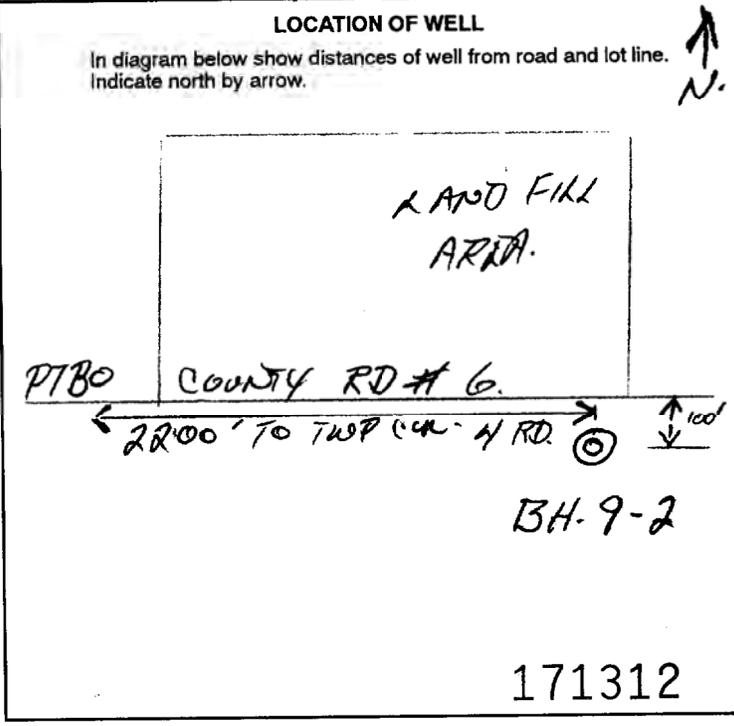
WATER RECORD			
Water found at - feet	Kind of water		
6	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals <input type="checkbox"/> Gas	

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
2"	Steel Galvanized Concrete Open hole Plastic	SCM NO	7.3	6.5

SCREEN	Sizes of opening (Slot No.)	Diameter	Length
#10	2 inches	5 feet	
P.V.C		6.5 feet	

PLUGGING & SEALING RECORD		
Annular space		Abandonment
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)
From	To	
0	1	CEMENT.
1	3	BENTONITE
3	11.5	#2 FILTER SAND.

PUMPING TEST		Pumping rate	Duration of pumping
<input type="checkbox"/> Pump <input type="checkbox"/> Bailer		GPM	Hours Mins
Static level	Water level end of pumping	Water levels during	<input type="checkbox"/> Pumping <input type="checkbox"/> Recovery
19-21	22-24	15 minutes 26-28 30 minutes 29-31 45 minutes 32-33 60 minutes 35-37	
feet	feet	feet	feet
If flowing give rate	Pump intake set at	Water at end of test	<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy
GPM	feet	GPM	
<input type="checkbox"/> Shallow <input type="checkbox"/> Deep	Recommended pump setting	Recommended pump rate	GPM
	feet	GPM	



FINAL STATUS OF WELL

Water supply
 Observation well
 Test hole
 Recharge well

Abandoned, insufficient supply
 Abandoned, poor quality
 Abandoned (Other)
 Dewatering

Unfinished
 Replacement well

WATER USE

Domestic
 Stock
 Irrigation
 Industrial

Commercial
 Municipal
 Public supply
 Cooling & air conditioning

Not used
 Other TASTING

METHOD OF CONSTRUCTION

Cable tool
 Rotary (conventional)
 Rotary (reverse)
 Rotary (air)

Air percussion
 Boring
 Diamond
 Jetting

110' LOW STEEL AUGERS.

Name of Well Contractor: TRIAQUA DRILLING
Well Contractor's Licence No.: 6778
Address: RR# 2 LAKEFIELD ONT
Name of Well Technician: PATRICK O'BRIEN
Well Technician's Licence No.: T2655
Signature of Technician/Contractor: [Signature]
Submission date: 21 08 97

MINISTRY USE ONLY

Data source: 6778
Date received: SEP 19 1997
Date of inspection: _____
Inspector: _____
Remarks: [Signature]

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11

5117573

Municipality 51007 Con. CON 04

County or District: PETERBOROUGH Township/Borough/City/Town/Village: DOURO
 Owner's surname: TOWNSHIP OF DOURO First name: DOURO Address: DOURO ONT
 Con. block tract survey, etc.: H Lot: 20
 Date completed: 19 08 97

Zone Easting Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
BLACK.	ORGANIC	PEAT		0	5.75
GRAY	SILT	FINE STONE	TILL / WAT	5.75	10
	LIMESTONE	BED ROCK.		10	31.5
		END OF HOLE		31.5	

31
32

WATER RECORD	
Water found at - feet	Kind of water
29	<input type="checkbox"/> Fresh <input type="checkbox"/> Sulphur <input type="checkbox"/> Salty <input type="checkbox"/> Minerals <input type="checkbox"/> <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Sulphur <input type="checkbox"/> Salty <input type="checkbox"/> Minerals <input type="checkbox"/> <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Sulphur <input type="checkbox"/> Salty <input type="checkbox"/> Minerals <input type="checkbox"/> <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Sulphur <input type="checkbox"/> Salty <input type="checkbox"/> Minerals <input type="checkbox"/> <input type="checkbox"/> Gas

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
2"	Steel Galvanized Concrete Open hole Plastic	50 40	+3	26.5
	Steel Galvanized Concrete Open hole Plastic			20-23
	Steel Galvanized Concrete Open hole Plastic			27-30

SCREEN
 Sizes of opening (Slot No.): #10
 Diameter: 2" inches Length: 5 feet
 Material and type: P.V.C.
 Depth at top of screen: 26.5 feet

61 PLUGGING & SEALING RECORD
 Annular space Abandonment
 Depth set at - feet: From 0 To 1' CEMENT
 Material and type (Cement grout, bentonite, etc.):
 1' 21.3 BENTONITE
 21.3 31.5 #2 FILTER SAND.

71 PUMPING TEST
 Pumping test method: Pump Bailer
 Pumping rate: GPM
 Duration of pumping: Hours Mins
 Static level: 19-21 feet
 Water level end of pumping: 22-24 feet
 Water levels during: 15 minutes 26-28 feet, 30 minutes 29-31 feet, 45 minutes 32-34 feet, 60 minutes 35-37 feet
 If flowing give rate: GPM
 Pump intake set at: feet
 Water at end of test: Clear Cloudy
 Recommended pump type: Shallow Deep
 Recommended pump setting: feet
 Recommended pump rate: GPM

LOCATION OF WELL
 In diagram below show distances of well from road and lot line. Indicate north by arrow.
 LAND FILL AREA.
 PTBO COUNTY RD #6
 2200' TWP RD #4
 BH 9-1
 171311

FINAL STATUS OF WELL
 Water supply Abandoned, insufficient supply Unfinished
 Observation well Abandoned, poor quality Replacement well
 Test hole Abandoned (Other)
 Recharge well Dewatering
 WATER USE
 Domestic Commercial Not used
 Stock Municipal Other: TEST
 Irrigation Public supply
 Industrial Cooling & air conditioning
 METHOD OF CONSTRUCTION
 Cable tool Air percussion Driving
 Rotary (conventional) Spring Digging
 Rotary (reverse) Diamond Other
 Rotary (air) Jetting
 HOLE WAS STRUCK AND CANCELED.

Name of Well Contractor: TRIAQUA DRILLING Well Contractor's Licence No.: 6778
 Address: RR#2 LAKEFIELD ONT
 Name of Well Technician: PATRICK O'BRIEN Well Technician's Licence No.: T2655
 Signature of Technician/Contractor: [Signature] Submission date: 24 08 97

MINISTRY USE ONLY
 Data source: Contractor 6778 Date received: SEP 19 1997
 Date of inspection: Inspector:
 Remarks: [Signature]

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

5116648

MUNICIP. 51097

CON. CON.

1994

COUNTY OR DISTRICT Peterborough	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE Douro	CON. BLOCK, TRACT, SURVEY, ETC. 04	LOT 22
OWNER (SURNAME FIRST) Lakefield Reseach	ADDRESS Box 4300 Lakefield, Ont.	DATE COMPLETED DAY 27 MO 07 YR 94	

21	ZONE	EASTING	NORTHING	RC	ELEVATION	RC	BASIN CODE	II	III	IV
----	------	---------	----------	----	-----------	----	------------	----	-----	----

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Reddish	Soil			0	1
Reddish	Sndy. loam			1	5
	F. Grvl. & snd. / lenses of clay			5	12
Brwn.	Lime. (Bedrock)			12	26

3' STIRUP
CEMENT
2' BENT
PILK
10'
PILK
15'
15'
BENT SEAL
17'

Piezometer tips are 2" in diameter with 5' screens on the end.

31	32
----	----

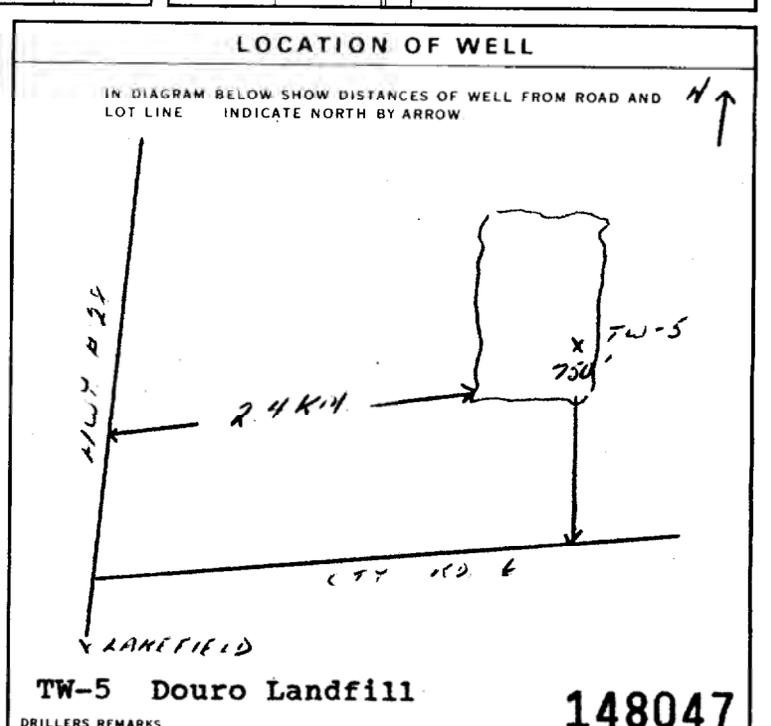
41 WATER RECORD	
WATER FOUND AT - FEET	KIND OF WATER
10-13	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS

51 CASING & OPEN HOLE RECORD				
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	12		13-16
17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	19		20-23
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	26		27-30

SCREEN	SIZE OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

61 PLUGGING & SEALING RECORD			
DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)	
FROM	TO		
10-13	14-17		
18-21	22-25		
26-29	30-33		

71 PUMPING TEST	PUMPING TEST METHOD		PUMPING RATE		DURATION OF PUMPING	
	1 <input type="checkbox"/> PUMP	2 <input type="checkbox"/> BAILER	GPM		15-16 HOURS 17-18 MINS	
	WATER LEVEL END OF PUMPING		WATER LEVELS DURING			
	10-21	22-24	15 MINUTES 26-28	30 MINUTES 29-31	45 MINUTES 32-34	60 MINUTES 35-37
IF FLOWING, GIVE RATE		PUMP INTAKE SET AT		WATER AT END OF TEST		
GPM		FEET		1 <input type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY		
RECOMMENDED PUMP TYPE		RECOMMENDED PUMP SETTING		RECOMMENDED PUMPING RATE		
1 <input type="checkbox"/> SHALLOW 2 <input type="checkbox"/> DEEP		FEET		GPM		



FINAL STATUS OF WELL	1 <input type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
	2 <input checked="" type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED POOR QUALITY
	3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
	4 <input type="checkbox"/> RECHARGE WELL	8 <input type="checkbox"/> DEWATERING
WATER USE	1 <input type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
	2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
	3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
	4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
	9 <input type="checkbox"/> NOT USED	

CONTRACTOR	NAME OF WELL CONTRACTOR Tri-Ontario Drilling	WELL CONTRACTOR'S LICENCE NUMBER 5022
	ADDRESS Box 1101 Fenelon Falls, Ont. KOM 1N0	
	NAME OF WELL TECHNICIAN Phil Brown	WELL TECHNICIAN'S LICENCE NUMBER T-0035
	SIGNATURE OF TECHNICIAN/CONTRACTOR <i>Phil Brown</i>	SUBMISSION DATE DAY 07 NO 08 YR 94

OFFICE USE ONLY	DATA SOURCE	CONTRACTOR 5022	DATE RECEIVED AUG 24 1994
	DATE OF INSPECTION	INSPECTOR	
REMARKS			

CSS.ES

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

5116647

MUNICIPALITY 51007

CON. 104

COUNTY OR DISTRICT: Peterborough
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Douro
CON. BLOCK, TRACT, SURVEY, ETC.: 04
LOT: 22
DATE COMPLETED: DAY 26 MO 07 YR 94
Address: 4300 Lakefield, Ont.

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Garbage & backfill			0	19
Brwn.	Lime. (Broken)			19	22
Brwn.	Lime. (Bedrock)			22	31

Handwritten notes in log:
3' s.u. cement pack
12' pack
20' pack
Piezometer tips are 2" in diameter with a 5" screen on the end
20' 1" BEAT SEAL 24' 4"

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER					
10-13	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/>	7 <input type="checkbox"/>
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/>	7 <input type="checkbox"/>
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/>	7 <input type="checkbox"/>
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/>	7 <input type="checkbox"/>
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/>	7 <input type="checkbox"/>

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			13-16
17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			20-23
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			27-30

SCREEN

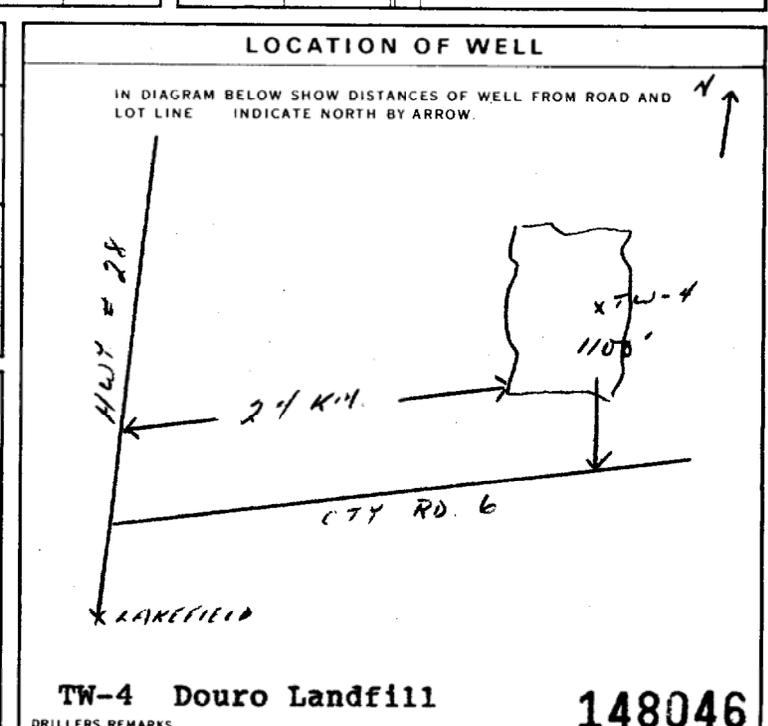
SIZE (S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
31-33	34-38	39-40
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN 41-44

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
FROM	TO	
10-13	18-17	
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	GPM	15-16 HOURS 17-18 MIN
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
19-21 FEET	22-24 FEET	15 MINUTES 29-31 FEET 30 MINUTES 29-31 FEET 45 MINUTES 32-34 FEET 60 MINUTES 35-37 FEET
IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 <input type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP	FEET	GPM



FINAL STATUS OF WELL

1 <input type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input checked="" type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	<input type="checkbox"/> DEWATERING

WATER USE

1 <input type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

METHOD OF CONSTRUCTION

1 <input type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input checked="" type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
4 <input type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
5 <input type="checkbox"/> AIR PERCUSSION	<input type="checkbox"/> DIGGING <input type="checkbox"/> OTHER

TW-4 Douro Landfill

148046

CONTRACTOR

NAME OF WELL CONTRACTOR: Tri-Ontario Drilling
WELL CONTRACTOR'S LICENCE NUMBER: 5022
ADDRESS: Box 1101 Fenelon Falls, Ont. KOM 1N0
NAME OF WELL TECHNICIAN: Phil Brown
WELL TECHNICIAN'S LICENCE NUMBER: T-0035
SIGNATURE OF TECHNICIAN/CONTRACTOR: Phil Brown
SUBMISSION DATE: DAY 04 NO 08 YR 94

OFFICE USE ONLY

DATA SOURCE: 58
CONTRACTOR: 5022
DATE RECEIVED: 59-62
DATE OF INSPECTION: AUG 24 1994
INSPECTOR: 63-68
REMARKS: 60

CSS.ES

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11 5116646 51097 1094

COUNTY OR DISTRICT: **Peterborough** TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: **Douro** CON. BLOCK, TRACT, SURVEY ETC.: **04** LOT: **22**
OWNER (SURNAME FIRST): **Lakefield Research** ADDRESS: **Box 4300 Lakefield, Ont.** DATE COMPLETED: DAY **26** MO **07** YR **94**

21 U ZONE EASTING NORTHING RC ELEVATION RC BASIN CODE II III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Garbage & backfill			0	12
Brwn.	Lime. (Broken)			12	15
Brwn.	Lime. (Bedrock)			15	24
			<i>3' s.u.</i>		
			<i>CEM.</i>		
			<i>2' BENT SEAL</i>		
			<i>5'4" PACK</i>		
			<i>12' BENT SEAL</i>		
			<i>17'4" PACK</i>		
<i>Presometer tips are 2' in diameter with a 5 screen on end.</i>					

31 32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER					
10-13	1 <input type="checkbox"/> FRESH	2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/>
15-18	1 <input type="checkbox"/> FRESH	2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/>
20-23	1 <input type="checkbox"/> FRESH	2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/>
25-28	1 <input type="checkbox"/> FRESH	2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/>
30-33	1 <input type="checkbox"/> FRESH	2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERALS	5 <input type="checkbox"/> GAS	6 <input type="checkbox"/>

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			13-16
17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			20-23
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			27-30

SCREEN

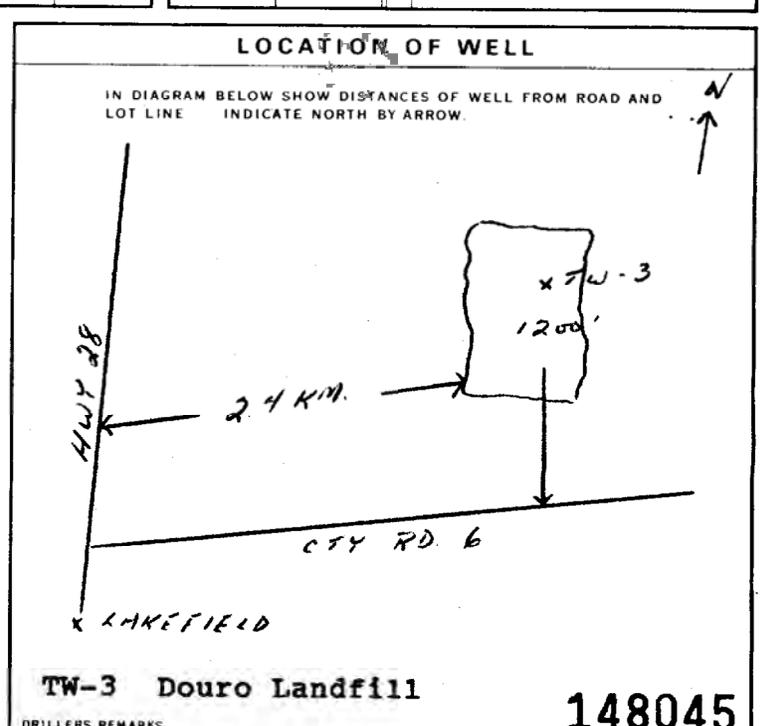
SIZE (SI) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER, ETC.
FROM	TO		
10-13	14-17		
18-21	22-25		
26-29	30-33		

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	GPM	15-16 HOURS 17-18 MIN.
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
18-21 FEET	22-24 FEET	1 <input type="checkbox"/> PUMPING 2 <input type="checkbox"/> RECOVERY
		15 MINUTES 26-28 FEET 30 MINUTES 29-31 FEET 45 MINUTES 32-34 FEET 60 MINUTES 35-37 FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 <input type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP	FEET	GPM



FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED INSUFFICIENT SUPPLY
2 OBSERVATION WELL 6 ABANDONED POOR QUALITY
3 TEST HOLE 7 UNFINISHED
4 RECHARGE WELL 8 DEWATERING

WATER USE

1 DOMESTIC 5 COMMERCIAL
2 STOCK 6 MUNICIPAL
3 IRRIGATION 7 PUBLIC SUPPLY
4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING
 OTHER 9 NOT USED

METHOD OF CONSTRUCTION

1 CABLE TOOL 5 BORING
2 ROTARY (CONVENTIONAL) 6 DIAMOND
3 ROTARY (REVERSE) 7 JETTING
4 ROTARY (AIR) 8 DRIVING
5 AIR PERCUSSION 9 DIGGING OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: **Tri-Ontario Drilling** WELL CONTRACTOR'S LICENCE NUMBER: **5022**
ADDRESS: **Box 1101 Fenelon Falls, Ont. K0M 1N0**
NAME OF WELL TECHNICIAN: **Phil Brown** WELL TECHNICIAN'S LICENCE NUMBER: **T-0035**
SIGNATURE OF TECHNICIAN/CONTRACTOR: *Phil Brown* SUBMISSION DATE: DAY **07** NO. **08** YR **94**

OFFICE USE ONLY

DATA SOURCE: **5022** CONTRACTOR: **5022** DATE RECEIVED: **AUG 24 1994**
DATE OF INSPECTION: _____ INSPECTOR: _____
REMARKS: _____

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

5116645

MUNICIPALITY 51007

CON. CON.

104

COUNTY OR DISTRICT Peterborough	TOWNSHIP BOROUGH CITY TOWN VILLAGE Douro	CON. BLOCK TRACT SURVEY ETC 04	LOT 22
OWNER (SURNAME FIRST) Lakefield Research	ADDRESS Box 4300 Lakefield, Ont,	DATE COMPLETED DAY 25 MO 07 YR 94	

21	ZONE	EASTING	NORTHING	RC	ELEVATION	RC	BASIN CODE	II	III	IV
----	------	---------	----------	----	-----------	----	------------	----	-----	----

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Lime. (Broken) / layers of sand			0	6
	Lime. (Bedrock)			6	27
			3'5" U. 0 C.C.H. 2' GENT 8'6" SEAL PACK 15'7"		
			15'7" GENT SEAL 21'4"		
			Piezometer tips are 2" in dia with a 5' screen on the end.		
			PACK		

31	32
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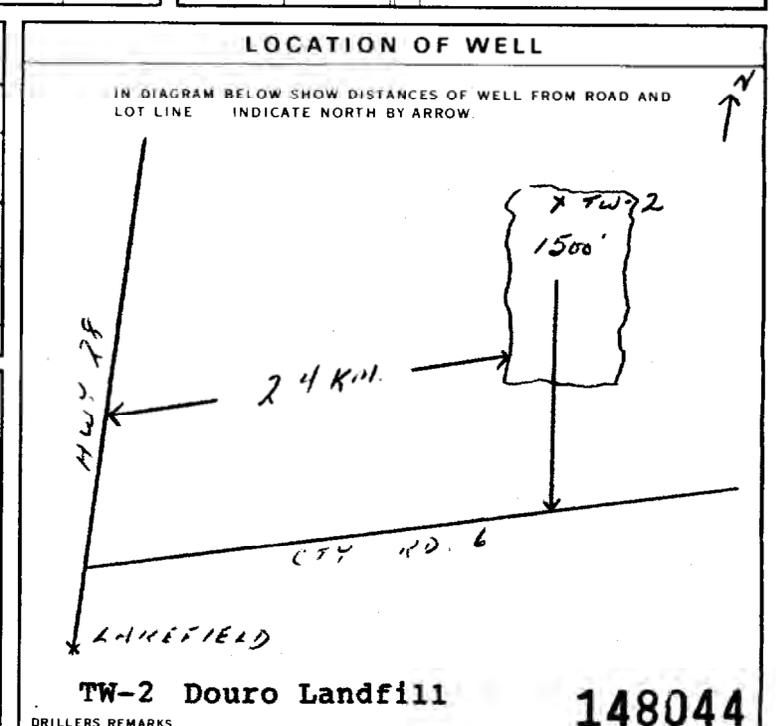
41 WATER RECORD	
WATER FOUND AT - FEET	KIND OF WATER
10-13	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERALS <input type="checkbox"/> GAS
15-18	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERALS <input type="checkbox"/> GAS
20-23	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERALS <input type="checkbox"/> GAS
25-28	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERALS <input type="checkbox"/> GAS
30-33	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERALS <input type="checkbox"/> GAS

51 CASING & OPEN HOLE RECORD				
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC			13-16
17-18	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC			20-23
24-25	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC			27-30

SCREEN	SIZE OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

61 PLUGGING & SEALING RECORD			
DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)	
FROM	TO		
10-13	14-17		
18-21	22-25		
26-29	30-33		

71 PUMPING TEST	
PUMPING TEST METHOD 1 <input type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	PUMPING RATE GPM
STATIC LEVEL WATER LEVEL END OF PUMPING WATER LEVELS DURING 15 MINUTES 30 MINUTES 45 MINUTES 60 MINUTES FEET FEET FEET FEET FEET	DURATION OF PUMPING 15-16 HOURS 17-18 MIN.
IF FLOWING GIVE RATE RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP	PUMP INTAKE SET AT FEET WATER AT END OF TEST <input type="checkbox"/> CLEAR <input type="checkbox"/> CLOUDY RECOMMENDED PUMP SETTING FEET RECOMMENDED PUMPING RATE GPM



FINAL STATUS OF WELL	
1 <input type="checkbox"/> WATER SUPPLY 2 <input checked="" type="checkbox"/> OBSERVATION WELL 3 <input type="checkbox"/> TEST HOLE 4 <input type="checkbox"/> RECHARGE WELL	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY 6 <input type="checkbox"/> ABANDONED, POOR QUALITY 7 <input type="checkbox"/> UNFINISHED <input type="checkbox"/> DEWATERING
WATER USE	
1 <input type="checkbox"/> DOMESTIC 2 <input type="checkbox"/> STOCK 3 <input type="checkbox"/> IRRIGATION 4 <input type="checkbox"/> INDUSTRIAL <input type="checkbox"/> OTHER	5 <input type="checkbox"/> COMMERCIAL 6 <input type="checkbox"/> MUNICIPAL 7 <input type="checkbox"/> PUBLIC SUPPLY 8 <input type="checkbox"/> COOLING OR AIR CONDITIONING <input type="checkbox"/> NOT USED
METHOD OF CONSTRUCTION	
1 <input type="checkbox"/> CABLE TOOL 2 <input checked="" type="checkbox"/> ROTARY (CONVENTIONAL) 3 <input type="checkbox"/> ROTARY (REVERSE) 4 <input type="checkbox"/> ROTARY (AIR) 5 <input type="checkbox"/> AIR PERCUSSION	6 <input type="checkbox"/> BORING 7 <input type="checkbox"/> DIAMOND <input type="checkbox"/> JETTING 9 <input type="checkbox"/> DRIVING <input type="checkbox"/> DIGGING <input type="checkbox"/> OTHER

CONTRACTOR NAME Tri-Ontario Drilling	WELL CONTRACTOR'S LICENCE NUMBER 5022
ADDRESS Box 1101 Fenelon Falls, Ont. K0M 1N0	
NAME OF WELL TECHNICIAN Phil Brown	WELL TECHNICIAN'S LICENCE NUMBER T-0035
SIGNATURE OF TECHNICIAN/CONTRACTOR <i>Phil Brown</i>	SUBMISSION DATE DAY 07 MO 08 YR 94

OFFICE USE ONLY	DATA SOURCE 5022	CONTRACTOR 5022	DATE RECEIVED AUG 24 1994
	GATE OF INSPECTION	INSPECTOR	
REMARKS			

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

5116644

MUNICIPALITY: 51007

CONTRACTOR: CON

LOT: 25-27

COUNTY OR DISTRICT: [Redacted] TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: [Redacted] CON. BLOCK, TRACT, SURVEY, ETC.: 04 LOT: 25-27

Box 4300 Lakefield, Ont. DATE COMPLETED: DAY 25 MO 07 YR 94

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Backfill & garbage			0	12
Brwn.	Lime. (Broken)			12	14
Brwn.	Lime. (Bedrock)			14	22
			3' 5 u. } 2' CE-4. Beal 7' 7" Seal PACK 12' 7" } 13' 7" Beal Seal PRESUMETER LIPS ARE 2" IN DIA WITH 5' SCREENS ON END 5' x 2" TIP 15' 1/2" PACK 2' 0" 1/2"		

31

32

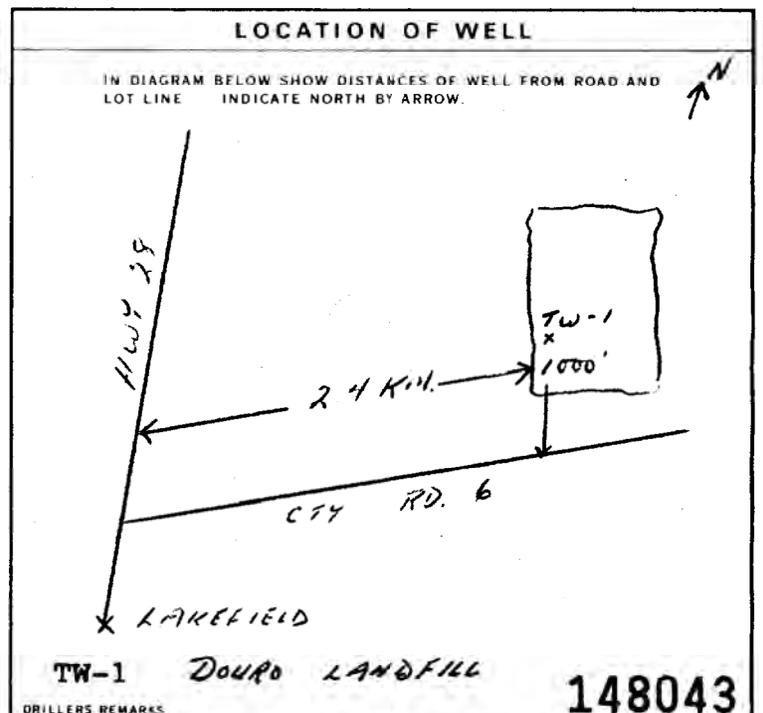
41 WATER RECORD			
WATER FOUND AT - FEET	KIND OF WATER		
10-13	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	14
15-18	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	19
20-23	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	24
25-28	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	29
30-33	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS	34

51 CASING & OPEN HOLE RECORD				
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	12		13-16
17-18	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	19		20-25
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	26		27-30

SCREEN	SIZE OF OPENING (SLOT NO.)	DIAMETER		LENGTH
		INCHES	FEET	FEET

61 PLUGGING & SEALING RECORD			
DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)	
FROM	TO		
10-13	14-17		
18-21	22-25		
26-29	30-33		

71 PUMPING TEST	PUMPING TEST METHOD		PUMPING RATE		DURATION OF PUMPING	
	1 <input type="checkbox"/> PUMP	2 <input type="checkbox"/> BAILER	GPM		15-16 HOURS	17-18 MINS
	STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
	19-21 FEET	22-24 FEET	15 MINUTES 25-28 FEET	30 MINUTES 29-31 FEET	45 MINUTES 32-34 FEET	60 MINUTES 35-37 FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST				
	GPM	1 <input type="checkbox"/> CLEAR	4 <input type="checkbox"/> CLOUDY			
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE		RECOMMENDED PUMPING RATE		
<input type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP	FEET	FEET		GPM		



FINAL STATUS OF WELL	1 <input type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
	2 <input checked="" type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
	3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	8 <input type="checkbox"/> DEWATERING	
WATER USE	1 <input type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
	2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
	3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING	
5 <input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED	
METHOD OF CONSTRUCTION	1 <input type="checkbox"/> CABLE TOOL	5 <input type="checkbox"/> BORING
	2 <input checked="" type="checkbox"/> ROTARY (CONVENTIONAL)	6 <input type="checkbox"/> DIAMOND
	3 <input type="checkbox"/> ROTARY (REVERSE)	7 <input type="checkbox"/> JETTING
4 <input type="checkbox"/> ROTARY (AIR)	8 <input type="checkbox"/> DRIVING	
5 <input type="checkbox"/> AIR PERCUSSION	9 <input type="checkbox"/> DIGGING	10 <input type="checkbox"/> OTHER

CONTRACTOR	NAME OF WELL CONTRACTOR		WELL CONTRACTOR'S LICENCE NUMBER	
	Tri-Ontario Drilling		5022	
	ADDRESS			
	Box 1101 Fenelon Falls, Ont. K0M 1N0			
CONTRACTOR	NAME OF WELL TECHNICIAN		WELL TECHNICIAN'S LICENCE NUMBER	
	Phil Brown		T-0035	
	SIGNATURE OF TECHNICIAN/CONTRACTOR			
	SUBMISSION DATE			
DAY 24		MO 08		YR 94

OFFICE USE ONLY	DATA SOURCE		CONTRACTOR		DATE RECEIVED	
	58		59-62		63-66	
	5022		5022		AUG 24 1994	
	DATE OF INSPECTION				INSPECTOR	
REMARKS						

CSS.ES



Appendix H

Well Records

Fully accessible appended items are available upon request.



Ontario

31 D/86

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

5106892

MUNICIPALITY 51007

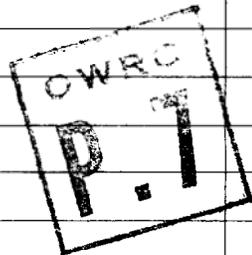
CONTRACTOR CON

04

COUNTY OR DISTRICT PETERBORO	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE DOURO	CONTRACT BLOCK, TRACT, SURVEY, ETC. CON	LOT 022
--	--	---	-------------------

DATE COMPLETED DAY 25 MO JAN YR 79	DATE COMPLETED DAY 7 MO JAN YR 79			
ING 271.50	RC 4	ELEVATION 082.0	RC 5	BASIN CODE 24

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
			PREVIOUSLY DUG	0	20
GREY	LIMESTONE			20	86



31	0020 23	0086 215
32		

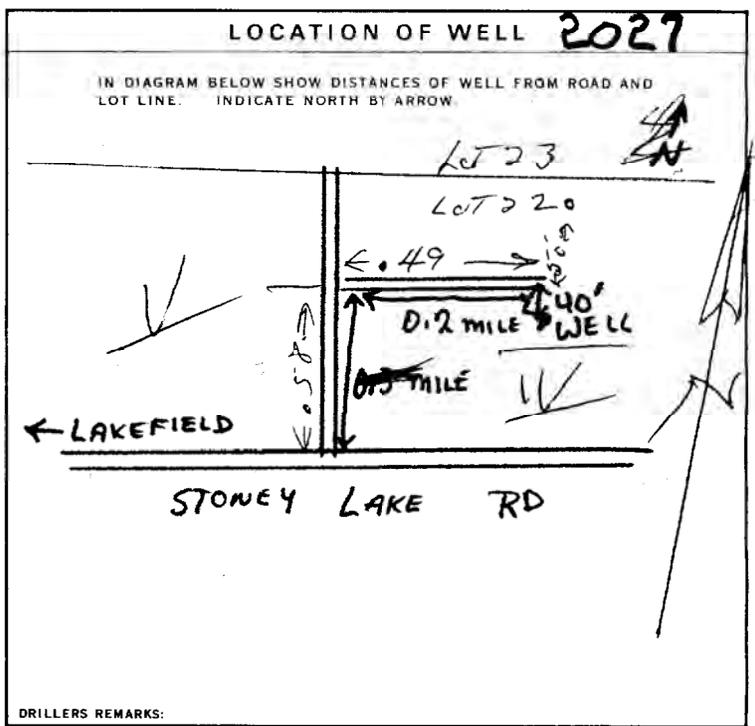
41 WATER RECORD			
WATER FOUND AT - FEET	KIND OF WATER		
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL
15-18	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD				
INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input checked="" type="checkbox"/> STEEL		0	22
17-18	1 <input type="checkbox"/> STEEL	188		
24-25	1 <input type="checkbox"/> STEEL			

SCREEN	SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

61 PLUGGING & SEALING RECORD			
DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)	
FROM	TO		
10-13	14-17		
18-21	22-25		
26-29	30-33		

71 PUMPING TEST	
PUMPING TEST METHOD 1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	PUMPING RATE 00/0 GPM
STATIC LEVEL 020 FEET	WATER LEVEL END OF PUMPING 070 FEET
WATER LEVELS DURING	DURATION OF PUMPING 01 HOURS 30 MINS
15 MINUTES: 020 FEET	RECOVERY
30 MINUTES: 020 FEET	
45 MINUTES: 020 FEET	
60 MINUTES: 020 FEET	
IF FLOWING GIVE RATE	WATER AT END OF TEST 1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE 1 <input type="checkbox"/> SHALLOW 2 <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING 080 FEET
	RECOMMENDED PUMPING RATE 0008 GPM
50-55 000.2 GPM / FT. SPECIFIC CAPACITY	



FINAL STATUS OF WELL	1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
	2 <input type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
	3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
	4 <input type="checkbox"/> RECHARGE WELL	
WATER USE	1 <input checked="" type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
	2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
	3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
	4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
		9 <input type="checkbox"/> NOT USED
METHOD OF DRILLING	1 <input checked="" type="checkbox"/> CABLE TOOL	4 <input type="checkbox"/> BORING
	2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
	3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
	4 <input type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
	5 <input type="checkbox"/> AIR PERCUSSION	

CONTRACTOR	NAME OF WELL CONTRACTOR ANTON URBAN	LICENCE NUMBER 5102
	ADDRESS RR#10 PETERBORO	
	NAME OF DRILLER OR BORER HEINZ URBAN	LICENCE NUMBER
	SIGNATURE OF CONTRACTOR <i>Anton Urban</i>	SUBMISSION DATE DAY 25 MO JAN YR 79

OFFICE USE ONLY	DATA SOURCE 1	CONTRACTOR 5102	DATE RECEIVED 210374
	DATE OF INSPECTION MAY 13/95	INSPECTOR K	
	REMARKS		



31 D/8E

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11 5107090 51007 CON 04

COUNTY OR DISTRICT: PETERBORO TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: DAWRO CON., BLOCK, TRACT, SURVEY, ETC.: CON. # TV LOT: 022

NG: 227146 RC: 4 ELEVATION: 082.0 RC: 5 BASIN CODE: 24 DATE COMPLETED: DAY 14 MO. SEPT YR. 74

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
			PREVIOUSLY DRILLED	0	86
GREY	LIMESTONE			86	124
RED	GRANITE			124	175

OWRC
P. 1

31 0086 24 0124215 0175721

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0172	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
06.64	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		86	0175
	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			
	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			

SCREEN

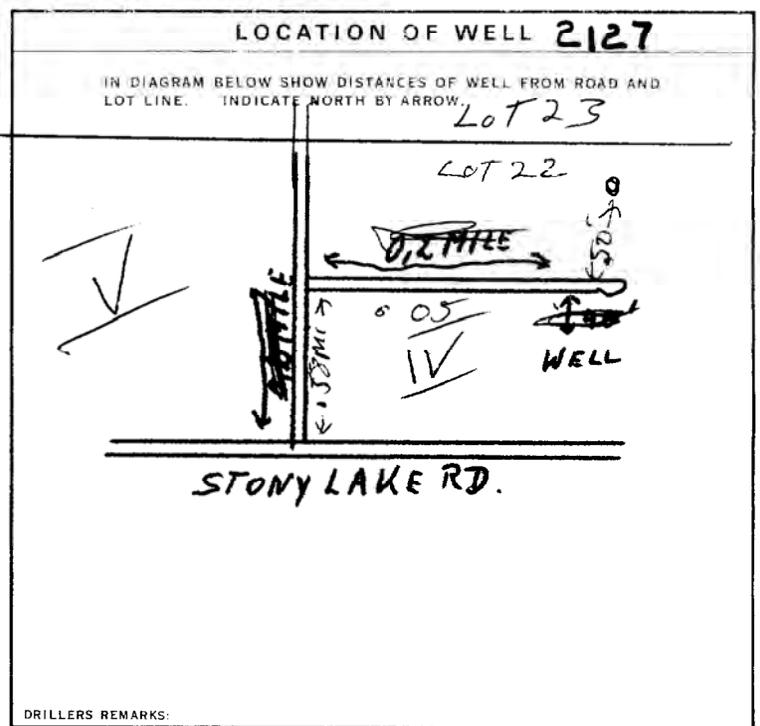
SIZE(S) OF OPENING - SLOT NO. 1	DIAMETER INCHES	LENGTH FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	(CEMENT GROUT LEAD PACKER, ETC.)
10-13		
18-21		
26-29		

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	0001 GPM	01 15-16 10 17-18 HOURS MINS.
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
020 FEET	170 FEET	15 MINUTES: 155 FEET 30 MINUTES: 145 FEET 45 MINUTES: 135 FEET 60 MINUTES: 125 FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	172 GPM	1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	172 FEET	0001 GPM
50-53 000.0 GPM / FEET SPECIFIC CAPACITY		



54 FINAL STATUS OF WELL

55-56 WATER USE

57 METHOD OF DRILLING

CONTRACTOR: ANTON URBAN, LICENCE NUMBER: 5102, ADDRESS: RR# 10 PETERBORO

NAME OF DRILLER OR BORER: ANTON URBAN, LICENCE NUMBER: 5102

SIGNATURE OF CONTRACTOR: Anton Urban, SUBMISSION DATE: DAY 11 MO. SEPT YR. 74

OFFICE USE ONLY

DATA SOURCE: 1, CONTRACTOR: 5102, DATE RECEIVED: 071074

DATE OF INSPECTION: MAY, 13/95, INSPECTOR: J.B.

REMARKS: P/J.B., W/J.B.



MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act
WATER WELL RECORD

31D/8E

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK CORRECT BOX WHERE APPLICABLE

11 5106698^P 51007^{MUNICIP.} CON^{CON.} 03

COUNTY OR DISTRICT: **Peterborough** TOWNSHIP: **Duoro** CON., BLOCK, TRACT, SURVEY, ETC.: **3** LOT: **020**

DATE COMPLETED: DAY **11** MO **10** YR **73**

RC: **26** ELEVATION: **279.5** BASIN CODE: **24**

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Top soil			0	1
Brown	clay	shale rock	dense	1	3
Grey	limestone rock		layered	3	135
Red/black	granite rock		hard	135	147

OWRC
P.7

31 0001102 0003605117 0135215 0147721

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0142	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
142-147	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERAL

untested

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
06	1 <input checked="" type="checkbox"/> STEEL	.188	0	0011
06	2 <input type="checkbox"/> GALVANIZED			
06	3 <input type="checkbox"/> CONCRETE			
06	4 <input type="checkbox"/> OPEN HOLE			
11	1 <input type="checkbox"/> STEEL		11	0147
11	2 <input type="checkbox"/> GALVANIZED			
11	3 <input type="checkbox"/> CONCRETE			
11	4 <input type="checkbox"/> OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
	INCHES	FEET
		41-44
		80

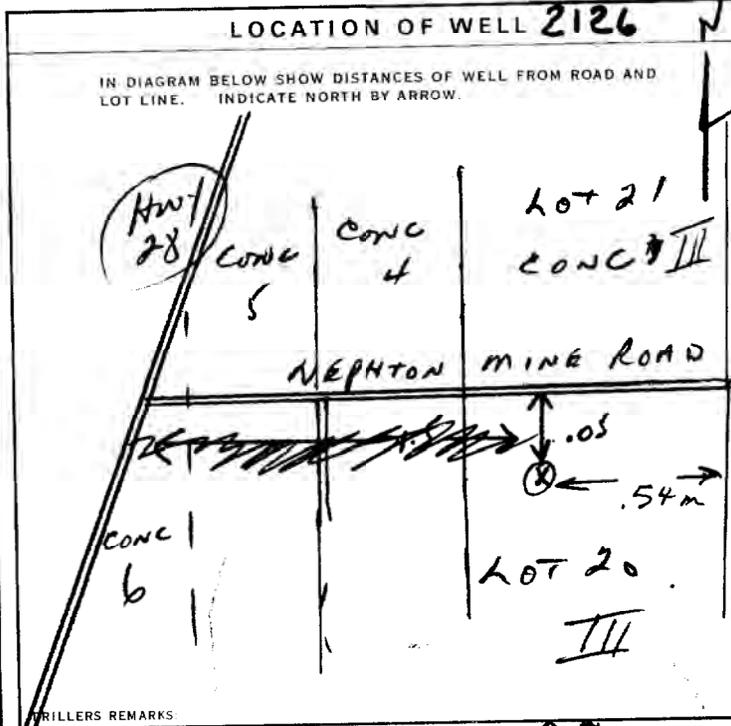
MATERIAL AND TYPE: _____ DEPTH TO TOP OF SCREEN: _____

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO	
10-13	14-17	
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

PUMPING TEST METHOD: 1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	PUMPING RATE: 0002 GPM	DURATION OF PUMPING: 03 HOURS 10 MINS
STATIC LEVEL: 035 FEET	WATER LEVEL END OF PUMPING: 142 FEET	WATER LEVELS DURING PUMPING: 15 MINUTES: 122, 30 MINUTES: 101, 45 MINUTES: 086, 60 MINUTES: 069
IF FLOWING, GIVE RATE: _____ GPM	PUMP INTAKE SET AT: 142 FEET	WATER AT END OF TEST: 1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE: <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING: 142 FEET	RECOMMENDED PUMPING RATE: 0002 GPM



FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY
 2 OBSERVATION WELL 6 ABANDONED, POOR QUALITY
 3 TEST HOLE 7 UNFINISHED
 4 RECHARGE WELL

WATER USE

1 DOMESTIC 5 COMMERCIAL
 2 STOCK 6 MUNICIPAL
 3 IRRIGATION 7 PUBLIC SUPPLY
 4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING
 9 NOT USED

METHOD OF DRILLING

1 CABLE TOOL 6 BORING
 2 ROTARY (CONVENTIONAL) 7 DIAMOND
 3 ROTARY (REVERSE) 8 JETTING
 4 ROTARY (AIR) 9 DRIVING
 5 AIR PERCUSSION

CONTRACTOR

NAME OF WELL CONTRACTOR: **Faulkner Well Drilling Co. Ltd.** LICENCE NUMBER: **2104**

ADDRESS: **789 Erskine Ave., Peterborough, Ont.**

NAME OF DRILLER OR BORER: **William Burgess** LICENCE NUMBER: _____

SIGNATURE OF CONTRACTOR: *W. J. Faulkner* SUBMISSION DATE: DAY **9** MO **11** YR **73**

OFFICE USE ONLY

DATA SOURCE: **1** CONTRACTOR: **2104** DATE RECEIVED: **0070174**

DATE OF INSPECTION: **May 21/75** INSPECTOR: **070174**

REMARKS: _____

P **10**

WI



The Ontario Water Resources Commission Act

WATER WELL RECORD

31 D / 8 E

Water management in Ontario 1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

5105259

MUNICIPAL 51.007

CON. 94N

04

COUNTY OR DISTRICT <i>Peterboro</i>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <i>Douro</i>	CON., BLOCK, TRACT, SURVEY, ETC. <i>4</i>	LOT <i>022</i>
P. R. # <i>2</i>		DATE COMPLETED DAY <i>22</i> MO. <i>09</i> YR. <i>70</i>	
RC. <i>26850</i>	RC. <i>4</i>	ELEVATION <i>0800</i>	RC. <i>5</i>
BASIN CODE <i>24</i>			

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>brown</i>	<i>clay</i>	<i>stones & boulders</i>		<i>0'</i>	<i>25'</i>
<i>brown</i>	<i>limestone rock</i>			<i>25'</i>	<i>59'</i>

31	<i>00350113</i>	<i>0059015</i>
32		

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
<i>0035</i>	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY
<i>35-59</i>	<input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
<i>15-18</i>	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY
<i>20-23</i>	<input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
<i>25-28</i>	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY
<i>30-33</i>	<input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<i>10-11</i>	<input checked="" type="checkbox"/> STEEL	<i>188</i>	<i>0'</i>	<i>25'</i>
<i>8-10</i>	<input type="checkbox"/> GALVANIZED		<i>26'</i>	<i>59'</i>
<i>17-18</i>	<input type="checkbox"/> CONCRETE			
<i>06</i>	<input checked="" type="checkbox"/> OPEN HOLE			<i>0059</i>
<i>24-25</i>	<input type="checkbox"/> STEEL			
	<input type="checkbox"/> GALVANIZED			
	<input type="checkbox"/> CONCRETE			
	<input type="checkbox"/> OPEN HOLE			

SCREEN

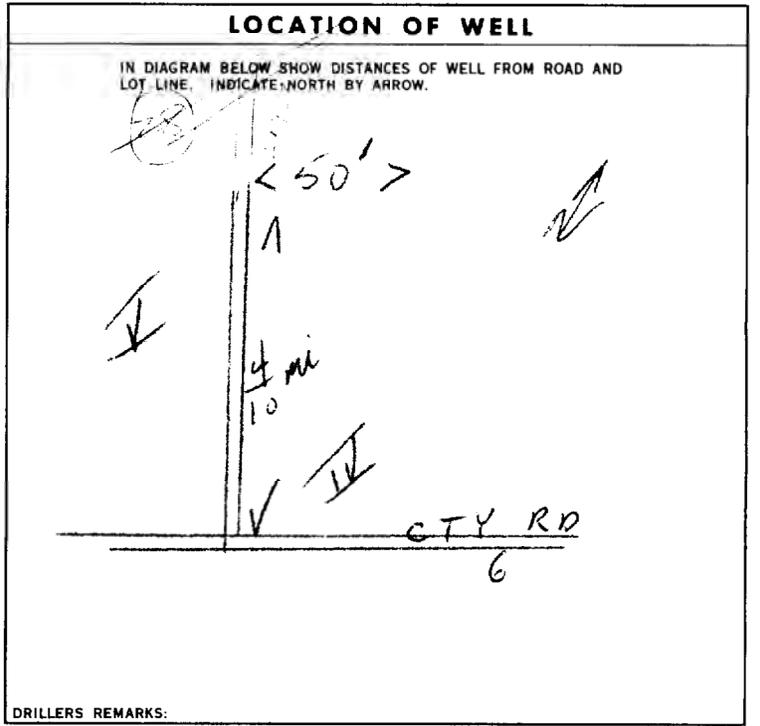
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
	INCHES	FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN	
	INCHES	FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
<i>10-13</i>	
<i>18-21</i>	
<i>26-29</i>	

71 PUMPING TEST

PUMPING TEST METHOD <input type="checkbox"/> PUMP <input checked="" type="checkbox"/> BAILER	PUMPING RATE <i>0005</i> GPM	DURATION OF PUMPING <i>02</i> HOURS <i>00</i> MINS.
STATIC LEVEL <i>030'</i> FEET	WATER LEVEL END OF PUMPING <i>049'</i> FEET	WATER LEVELS DURING PUMPING
<i>19-21</i>	<i>22-24</i>	<i>15 MINUTES</i> <i>26-28</i> <i>045'</i> FEET
<i>25-27</i>	<i>29-31</i>	<i>30 MINUTES</i> <i>040'</i> FEET
<i>32-34</i>	<i>35-37</i>	<i>45 MINUTES</i> <i>035'</i> FEET
<i>38-41</i>	<i>42</i>	<i>60 MINUTES</i> <i>030'</i> FEET
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING <i>056'</i> FEET	RECOMMENDED PUMPING RATE <i>0004</i> GPM



FINAL STATUS OF WELL

WATER SUPPLY ABANDONED, INSUFFICIENT SUPPLY
 OBSERVATION WELL ABANDONED, POOR QUALITY
 TEST HOLE UNFINISHED
 RECHARGE WELL

WATER USE

01
 DOMESTIC COMMERCIAL
 STOCK MUNICIPAL
 IRRIGATION PUBLIC SUPPLY
 INDUSTRIAL COOLING OR AIR CONDITIONING
 OTHER NOT USED

METHOD OF DRILLING

CABLE TOOL BORING
 ROTARY (CONVENTIONAL) DIAMOND
 ROTARY (REVERSE) JETTING
 ROTARY (AIR) DRIVING
 AIR PERCUSSION

CONTRACTOR

NAME OF WELL CONTRACTOR: *Stuart Stockdale Well Drilling* LICENCE NUMBER: *4814*
 ADDRESS: *R. R. # 2, Peterboro*
 NAME OF DRILLER OR BORER: *Ernie Seabrooke* LICENCE NUMBER:
 SIGNATURE OF CONTRACTOR: *Stuart Stockdale* SUBMISSION DATE: DAY *2* MO. *Nov.* YR. *70*

OFFICE USE ONLY

DATA SOURCE: *1* CONTRACTOR: *4814* DATE RECEIVED: *231170*
 DATE OF INSPECTION: INSPECTOR: *P/F KIL*
 REMARKS: *1 of water & cement factory now business*

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

5115833

MUNICIP 51007

CON. CON.

104

COUNTY OR DISTRICT: *Pelee Islands* TOWNSHIP BOROUGH CITY, TOWN, VILLAGE: *Con. IV* CON. BLOCK, TRACT, SURVEY ETC: *21* LOT: *21*

DATE COMPLETED: DAY *30* MO *Oct.* YR *91*

ADDRESS: *R. #2, Lakefield*

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>brown</i>	<i>clay, stones</i>			<i>0'</i>	<i>6'</i>
<i>grey</i>	<i>shale limestone</i>			<i>6'</i>	<i>10'</i>
<i>grey</i>	<i>limestone bedrock</i>			<i>10'</i>	<i>53'</i>
<i>dark grey</i>	<i>limestone bedrock</i>			<i>53'</i>	<i>62'</i>

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
<i>53'-62'</i>	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERALS <input type="checkbox"/> GAS
	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERALS <input type="checkbox"/> GAS
	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERALS <input type="checkbox"/> GAS
	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERALS <input type="checkbox"/> GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<i>6 1/4"</i>	<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC	<i>188</i>	<i>1'</i>	<i>21'</i>
<i>6 1/4"</i>	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC		<i>21'</i>	<i>62'</i>
	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE <input type="checkbox"/> PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE: _____ DEPTH TO TOP OF SCREEN: _____

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER, ETC.
<i>10-13</i>	<i>14-17</i>	
<i>18-21</i>	<i>22-25</i>	
<i>26-29</i>	<i>30-33</i>	

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
<input type="checkbox"/> PUMP <input checked="" type="checkbox"/> BAILEY	<i>7</i> GPM	<i>2</i> HOURS
STATIC LEVEL: <i>42'</i>	WATER LEVEL END OF PUMPING: <i>50'</i>	WATER LEVELS DURING:
		15 MINUTES: <i>40'</i> 30 MINUTES: <i>42'</i> 45 MINUTES: <i>42'</i> 60 MINUTES: <i>42'</i>
IF FLOWING GIVE RATE: _____	PUMP INTAKE SET AT: _____	WATER AT END OF TEST: <i>42'</i>
RECOMMENDED PUMP TYPE: <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING: <i>58'</i>	RECOMMENDED PUMPING RATE: <i>6</i> GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE INDICATE NORTH BY ARROW.

CHEESE STORE SOUTH STONEY LAKE RD, 110207

DRILLERS REMARKS

FINAL STATUS OF WELL

WATER SUPPLY ABANDONED, INSUFFICIENT SUPPLY
 OBSERVATION WELL ABANDONED, POOR QUALITY
 TEST HOLE UNFINISHED
 RECHARGE WELL DEWATERING

WATER USE

DOMESTIC COMMERCIAL
 STOCK MUNICIPAL
 IRRIGATION PUBLIC SUPPLY
 INDUSTRIAL COOLING OR AIR CONDITIONING
 OTHER NOT USED

METHOD OF CONSTRUCTION

CABLE TOOL BORING
 ROTARY (CONVENTIONAL) DIAMOND
 ROTARY (REVERSE) JETTING
 ROTARY (AIR) DRIVING
 AIR PERCUSSION DIGGING OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: *Stuart Stockdale Well Drilling* WELL CONTRACTOR'S LICENCE NUMBER: *4814*

ADDRESS: *R.R. #1, Ormeau*

NAME OF WELL TECHNICIAN: *Stuart Stockdale* WELL TECHNICIAN'S LICENCE NUMBER: *T-0055*

SIGNATURE OF TECHNICIAN/CONTRACTOR: *Stuart Stockdale* SUBMISSION DATE: _____

OFFICE USE ONLY

DATA SOURCE: _____ CONTRACTOR: *4814* DATE RECEIVED: *MAY 06 1992*

DATE OF INSPECTION: _____ INSPECTOR: _____

REMARKS: _____

CSS.ES



Appendix I

Monthly Waste Quantities

Fully accessible appended items are available upon request.

Materials Received

2021	C&D	Waste	Tires	Green Waste	Wood	Total
January	829.23	2,153.35	-	1.47	32.12	3,016.17
February	512.30	2,017.93	-	0.18	27.76	2,558.17
March	849.39	2,818.72	-	1.42	38.92	3,708.45
April	1,212.42	2,821.64	-	6.07	36.63	4,076.76
May	1,020.47	2,930.42	-	13.93	47.52	4,012.34
June	903.50	3,386.87	-	10.56	34.09	4,335.02
July	861.92	3,543.30	-	12.88	40.96	4,459.06
August	1,193.73	3,517.65	-	32.32	29.97	4,773.67
September	1,231.29	3,486.99	-	16.84	38.66	4,773.78
October	1,496.15	3,269.30	-	6.61	41.16	4,813.22
November	1,032.64	3,072.81	-	7.74	46.82	4,160.01
December	658.91	2,523.55	-	3.54	40.38	3,226.38
Totals	11,801.95	35,542.53	-	113.56	454.99	47,913.03
Total Tonnage Received		47,913.03				

Material Shipped Out

Month	Waste	Wood	Tires	Metal	Cover	Mixed C&D	Total
January	1,957.12	80.32	-	24.65	-	1,338.88	3,400.97
February	1,832.20	112.28	-	-	-	954.29	2,898.77
March	2,009.51	188.70	-	19.26	-	1,702.13	3,919.60
April	2,381.83	-	-	-	-	1,814.85	4,196.68
May	2,098.82	-	-	-	-	2,134.37	4,233.19
June	2,406.95	-	-	7.07	-	1,856.45	4,270.47
July	2,824.59	-	-	8.12	-	1,704.04	4,536.75
August	2,670.04	-	-	4.75	-	1,771.56	4,446.35
September	2,586.92	-	-	3.57	-	1,938.19	4,528.68
October	2,570.03	-	-	-	-	2,564.78	5,134.81
November	2,256.27	-	-	3.85	-	1,908.51	4,168.63
December	2,019.51	-	-	-	-	1,109.33	3,128.84
	27,613.79	381.30	-	71.27	-	20,797.38	48,863.74
Total Tonnage Shipped Out				48,863.74			

Destination

Month	001037 - Waste Connections - Ridge Landfill	001039 - Waste Connections - Ottawa Landfill	001071 - BIOMASS	001121 - GFL - MOOSE CREEK	001002 - Waste Connections to Ptbo Iron & Metal	Grand Total
January	1,679.72	1,406.64	80.32	209.64	24.65	3,400.97
February	1,563.42	918.11	112.28	304.96	-	2,898.77
March	1,868.31	1,429.95	188.70	413.38	19.26	3,919.60
April	3,130.45	588.44	-	477.79	-	4,196.68
May	3,189.76	716.91	-	326.52	-	4,233.19
June	3,044.88	732.68	-	485.84	7.07	4,270.47
July	3,713.71	360.01	-	454.91	8.12	4,536.75
August	3,854.92	333.49	-	253.19	4.75	4,446.35
September	3,736.86	565.53	-	222.72	3.57	4,528.68
October	3,634.21	1,463.62	-	36.98	-	5,134.81
November	2,976.53	1,188.25	-	-	3.85	4,168.63
December	2,179.98	917.70	-	31.16	-	3,128.84
Grand Total	34,572.75	10,621.33	381.30	3,217.09	71.27	48,863.74