Hydrogeological Assessment, Woodview Golf Subdivision

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Prepared for:
Eric Challenger

Cambium Reference: 15101-001

CAMBIUM INC.

866.217.7900

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Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

Cambium Inc. (Cambium) was retained by Woodview Golf Course (the Client) to undertake a hydrogeological assessment for a proposed subdivision development located on 65 Northeys Bay Road, in the Township of North Kawartha (herein referred to as the Site; Figure 1).

The total area of the property is approximately 121.9 ha (301.2 acres). It is proposed that the 26.8 ha (66.2 acre) potential development portion of the Site would be developed in to 58 new residential lots and a 1.4 ha commercial lot. Cambium understands that the existing property to the north of the potential development area will remain residential.

A conceptual site plan of the proposed development is included in Appendix A. Cambium undertook a geotechnical investigation to determine geotechnical parameters and recommendations for the design and construction of roads and buildings for the proposed development (Cambium, 2023).

There are no municipal water or wastewater services available near the property; therefore, the Site has to be privately serviced. As such, a hydrogeological assessment was undertaken for the required on-site wastewater services and water supply, in accordance with the Ministry of the Environment and Climate Change (MECP) Guidelines D-5-4 and D-5-5.

The suitability of the development area for on-site disposal of wastewater was determined by identifying and characterizing the native soils and bedrock, the location of the shallow water table, and surficial slopes across the Site. Additionally, a predictive assessment of the attenuation capacity of Site for the potential nitrate contamination from on-site wastewater systems was conducted.

The water supply assessment included the installation and hydraulic testing of test wells and water quality testing of the granite bedrock aquifer to determine the sustainability of on-site groundwater resources.

Cambium used the results of the wastewater and water supply assessments to calculate the maximum number of residential lots for the Site considering its specific conditions (i.e., soil type, bedrock depth, terrain, and groundwater characteristics).

1.1 Site Description

The Site is irregular in shape and is bound by Northey's Bay Road to the west, Otis Northey Road to the northwest, and Fire Route 35 to the northeast. The regional location map of the Site is represented in Figure 1.

Most of the Site is identified as forested land with unevaluated wetlands throughout the eastern portion of the Site. The areas to the east and south of the Site are undeveloped woodlot (Figure 2). The land on the western portion of the Site is currently developed as a golf course.

The Township requested that the County of Peterborough (as part of their Official Plan Update) adjust the Woodview Hamlet Area to include the entire golf course. The request was approved by both the County and Township and can be seen in the Township of North Kawartha Land Use Schedule of the new County Official Plan (Appendix A).

On June 29, 2022, Peterborough County Council adopted the new County Official Plan through By-law Number 2022-47. The inclusion of the entire golf course (including the entirety of the potential development area) within the Woodview Hamlet area and the corresponding Rural Settlement land use designation will come into effect when the Official Plan receives approval from the Minister of Municipal Affairs and Housing.

2.0 Geological and Hydrogeological Setting

2.1 Topography and Drainage

As shown on the Ministry of Natural Resources and Forestry (MNRF) topography map in Appendix A, the Site generally slopes inward towards the EC wetland zone and an unnamed pond in the middle of the property which has a minimum elevation of approximately 259 m above sea level (masl).

There is a topographic high point at the northwest portion of Site with an elevation of 272 masl. The land gently slopes from the northwestern corner toward the unevaluated wetland and the unnamed pond in the center of the Site. Topography near the eastern border of the Site has a maximum elevation of 265 masl. From this local high point, the land slopes west toward the wetland and pond (MNRF, 2023).

Runoff is assumed to follow local topography and flow from both east and west into the wetland at center of the Site. From this wetland water will flow into the unnamed pond and ultimately discharge via an unnamed creak flowing southeast into Stony Lake, located approximately 2.4 km from the Site.

2.2 Physiography

The Site is located along the boundary of two physiographic regions. Most of Site falls within the Physiographic region known as the Georgian Bay Fringe (Chapman, 1984). This region is described as having very shallow soil and bare rock knobs and ridges. The region is a broad belt bordering Georgian bay that was separated the Algonquin Highlands. The region stretches from Parry Sound in the west to northern Kawartha Lakes where the Site is located. Glacial Lake Algonquin inundated much of the eastern portion of the region; however the area of North Kawartha Lakes was never inundated. This resulted in land with shallow soils of fine sand, silt, and clay in valleys with the other areas being exposed bare rock.

The southwest corner of the Site falls within the Dummer Moraines physiographic region. This region is characterized by rough stoney land with bedrock consisting of sedimentary limestone.

The moraines in the Kawartha Lakes have angular fragments, abundant Precambrian rocks, and limestone blocks (Chapman, 1984).

The physiographic landforms across most of the Site area are mapped as fringe bare rock ridges and shallow till with limestone plains identified in the southwest portion of the Site (Chapman, 2007)

2.3 Geology

The northeast portion the Site is overlain by a clay, silt, sand, and gravel veneer with primarily Paleozoic bedrock (Ontario Geological Survey, 2010). The west portion of the Site is characterized as a stony carbonate-derived glacial silty sand to sandy silt textured till on Paleozoic terrain. The southern center of the Site is classified as a wetland organic part, muck, and marl soil.

The Paleozoic bedrock in the area is primarily from the Middle Ordovician and identified as the Gull River Formation, which is composed of light grey to brown limestone with dolostone towards the base (OGS, 2007). The east portion of the Site is underlain by a crystalline Precambrian basement formation.

2.4 Vulnerable and Regulated Areas

The Site is situated within Otonabee – Peterborough Source Protection Area as per the Ministry of the Environment, Conservation and Parks (Ministry) Source Water Protection Information Atlas (SPIA) (MECP, 2022).

The Site is not located in a municipal well head protection area, or significant groundwater recharge area. However, the proposed development is in the following:

- Completely located within a Highly Vulnerable Aquifer (HVA) with a vulnerability score of 6
- Partially located within an Intake Protection Zone 3 (IPZ-3).

The Site area does not fall under regulated areas by a Conservation Authority. The Site is not located within any Areas of Natural and Scientific Interest (ANSI) (Ministy of Natural Resources and Forestry, 2022). The SPIA mapping is included in Appendix A.

3.0 Methodology

This section describes the methodology undertaken to complete the hydrogeological assessment.

3.1 Background Information

A thorough review of the available relevant background information was undertaken for this study, which included the following:

- Chapman, L.J. and D.F. Putnam. (1984). The Physiography of Southern Ontario: Ontario Geological Survey, Special Volume 2
- Ontario Geological Survey, 2010. Surficial Geology of Southern Ontario, available in digital format at 1:50 000 Scale.
- Ontario Geological Survey, 2011. Scale Bedrock Geology of Ontario, available in natural heritage digital format at 1:250 000 scale.
- Source Protection Area Mapping provided by the Ministry of Environment, Conservation and Parks (MECP)
- Natural Heritage Areas Mapping, available online through the Ministry of Natural Resources and Forestry.
- Topographic Mapping, available online through the Ministry of Natural Resources and Forestry.
- Water Well Information System (WWIS) provided by the MECP.

3.2 Test-Pit Investigation

On November 4, 2022, Cambium geotechnical staff attended the Site to complete a test pit investigation. The test pits were completed to determine the shallow subsurface conditions across the developable (western) area of the Site. The test-pits were excavated using a track-mounted excavator under the supervision of a Cambium technologist.

A total of 33 test pits, designated as TP101-22 through TP133-22 were advanced throughout the Site (Figure 3). Dynamic probe penetration tests (DPT) were completed at each test pit to determine compaction coefficient of the encountered soil.

In addition to DPTs, soil samples were collected from all test pits. Samples were logged for soil colour, texture, structure, moisture content, and consistency/compaction. Each sample was handled only by the technologist using dedicated nitrile gloves. Open test pits were backfilled with the excavated soils and compacted with the backhoe bucket. The test pit logs are provided in Appendix B.

3.3 Test Well Selection and Installation

The proposed development area is 26.8 ha in size, which is greater than 25 ha but less than 40 ha; therefore, 5 test wells for water supply assessment were required according to D-5-5 Technical Guideline for Private Wells: Water Supply Assessment (MECP, 1996). Four test wells, denoted as Test Well 1 (TW1), Test Well 2 (TW2), Test Well 3 (TW3), and Test Well 4 (TW4), were selected from the existing water supply wells distributed across the Site area and an adjacent property. One well, denoted Test Well 5 (TW5), was drilled by Burgess Well Drilling on November 11, 2022, to satisfy the five test well requirement from Guideline D-5-5. The well locations can be seen on Figure 3.

All five test wells were drilled into granite bedrock, with fractures observed from 7.6 metres below ground surface (mbgs) to 91 mbgs, with a mean depth of 34.4 mbgs. The overburden at the test well locations was relatively thin, ranging from 0 mbgs (exposed bedrock) to 6.1 mbgs, with an average thickness of 1.5 mbgs. The depths of the test wells varied from 13.1 mbgs to 91.0 mbgs, with a mean of 48.6 mbgs.

Section 4.2 iv of Guideline D-5-5 requires that test wells be located and constructed in such a way as to allow for the prediction of groundwater quantity. The test wells each had a pumping rate greater than 13.7 L/min, which is the minimum allowable pumping test rate according to Guideline D-5-5. Details of the five test wells are summarized in Table 1. The well records for the test wells are presented in Appendix C.

Table 1 Test and Monitoring Well Information Summary

Test Well ID	Thickness of Overburden (m)	Water Found Depth (mbgs)	Well Completion Material	Depth of the Well (mbgs)	Pumping Rate from Well Yield Test (L/min)
TW1	0.5	91.0	Granite Bedrock	91.0	40.0
TW2	0	61.0	Granite Bedrock	88.4	22.7
TW3	6.1	11.0	Granite Bedrock	13.1	45.4
TW4	0	17.7	Granite Bedrock	19.8	68.1
TW5	0.9	7.6	Granite Bedrock	30.5	37.9
MW1	Unknown	8.5	Unknown	30.5	Unknown
MW2	0	30.5	Granite Bedrock	31.9	4.5

1 – Well record for MW1 not found in MECP Well records database

3.4 Hydraulic Pumping Tests

On October 31, November 1, November 2, and November 3, 2022, Cambium staff completed a series of 6-hour pumping tests on each of the four existing on-site test wells. Cambium returned to complete a pumping test for the newly installed test well (TW5) on November 23, 2022.

Two additional pre-existing water supply wells were selected for monitoring at the Site and denoted MW1 and MW2. While one test well was undergoing a pumping test, the two monitoring wells and the other four on-site test wells (TW1 to TW5) were monitored for the duration of the pumping tests. The location of the wells is shown on Figure 3.

Water levels during the pumping tests were measured using Solinst™ pressure transducer Leveloggers installed in each of the five test wells. Barometric pressure was monitored using a Solinst™ Barologger and the collected data was used for water level data compensation purposes.

Manual water level readings were recorded for the test well being evaluated using a water level tape in the event of a malfunction with the logger. Additionally, manual measurements were taken of surrounding wells every hour throughout the duration of the test to see if the pumping well had influence on the water levels of the other test wells and monitoring wells.

3.4.1 Test Well 1

On October 31, 2022, Cambium met with the Client to complete a pumping test for TW1. Field staff denoted the well “Neighbours House” on the day of the investigation. This name was changed to TW1 after the field investigation was complete.

The Client had a pump preinstalled and ready for TW1. The pump was set at a depth of approximately 38 mbgs. A pressure transducer Levelogger was installed above this depth to measure water levels within the well. Water levels were also measured manually to mitigate against potential equipment failure. Disinfectant bleach was added to the well water prior to testing. The discharge end of the hose was disinfected by Cambium staff.

The static water level of well TW1 was 9.35 mbtoc. The well casing stickup of TW1 was 0.60 meters, therefore the static water level was 8.75 mbgs. The depth of the well from the MECP well record is 91 mbgs. Well depth was not verified in the field. The available depth of drawdown was 28.7 m prior to the commencement of the pumping test.

The pumping test commenced at 10:43. The discharge outlet was placed at about 50 m to the northwest of TW1. The pumping rate was measured at a flow rate of 25 to 30 L/min at the beginning of the test from 0 to 4 minutes. The flow rate was adjusted to establish a sustainable pumping rate for the duration of the test; adjustments were made during the initial stage of the pumping test with a rate decrease down to 14 L/min from 4 to12 minutes and a subsequent increase to 16 L/min for the remainder of the test.

Water levels were measured in test wells TW1 to TW4 and the two monitoring wells denoted Monitoring Well 1 (MW1) and Monitoring Well 2 (MW2) during the pumping of TW1. The water levels were recorded using pressure transducers and measured manually on hourly intervals. Additionally, every hour turbidity and residual chlorine measurements were measured for the pumping well by Cambium staff.

The pump was turned off after 6 hours at 16:43 and water level recovery was monitored until 17:43, allowing for 97% recovery in 1 hour.

3.4.2 Test Well 2

On November 1, 2022, Cambium staff arrived at the Site for a pumping test on TW2. Field staff denoted the well “Pro Shop” during the field investigation This name was changed to TW2 after the pumping test was complete.

The Client had a pump preinstalled and ready for the pump test for TW2. The pump was set at a depth of approximately 84 mbgs. A pressure transducer Levelogger was installed above this depth to measure water levels within the well. Water levels were also measured manually to mitigate against potential equipment failure. Disinfectant bleach was added to the well water prior to testing, on October 31, 2022. The discharge end of the hose was disinfected by Cambium staff.

The static water level of well TW2 was 9.20 mbtoc (the casing stickup of TW2 was 0.38 m, therefore the static water level was 8.82 mbgs). The depth of the well from the MECP well record is approximately 88.4 mbgs. Well depth was not verified in the field. The available depth of drawdown was 74.8 m prior to the commencement of the pumping test.

Pumping commenced at TW2 at 09:30 on November 1, 2022. The flow was set to a constant rate of approximately 14 L/min for the duration of the 6-hour test.

Water levels were measured in test wells TW1 to TW4 and the two monitoring wells (MW1 and MW2) during the pumping of TW2. The water levels were recorded using pressure transducers and taken manually on hourly intervals. Additionally, every hour turbidity and residual chlorine measurements were measured for the pumping well by Cambium staff.

The discharge outlet was located approximately 20 m to the southeast of TW2. The pump was turned off at 15:30 and the well recovery was monitored manually until 17:00, reaching approximately 98% recovery in 1.5 hours.

3.4.3 Test Well 3

On November 2, 2022, Cambium staff arrived at Site for a pumping test for TW3. Cambium staff named the well “North Well” on the day of the pumping test. This name was later changed to TW3 after the field investigation was complete.

The Client had a pump installed in the well already for irrigation use for the golf course. The pump was set at a depth of approximately 12 mbgs. A pressure transducer Levelogger was installed above this depth to measure water levels within the well. A pressure transducer Levelogger was installed below this depth to measure water levels within the well. Water levels were also measured manually to mitigate against potential equipment failure. Disinfectant bleach was added to the well water prior to testing, on October 31, 2022. The discharge end of the hose was disinfected by Cambium staff.

The static water level of well TW3 was 5.23 mbtoc (the casing stickup of TW3 was 0.26 m, therefore the static water level was 4.97 mbgs). The depth of the well from the MECP well record is approximately 13.1 mbgs. Well depth was not verified in the field. The available depth of drawdown was 6.8 m prior to the commencement of the pumping test.

A pumping test for TW3 was attempted at 9:00 on November 2, 2023; however, the generator malfunctioned, and the Client had to source another generator. The well was left to recover back to static conditions as seen in Figure 6. Pumping for the test re-commenced at 10:00 on November 2, 2022. The flow was set to a constant rate of approximately 22.7 L/min or 5 imperial gallons per minute (igpm) for the duration of the 6-hour test.

Water levels were measured in test wells TW1 to TW4 and the two monitoring wells (MW1 and MW2) during the pumping of TW3. The water levels were recorded using pressure transducers and measured manually on hourly intervals. Additionally, every hour turbidity and residual chlorine measurements were measured for the pumping well by Cambium staff.

The discharge outlet was located approximately 80 m to the south of TW3 into a pond on the Site. The pump was turned off at 16:00 and the well recovery was monitored manually until 17:00 at 60% recovery. Cambium left the data logger recording the levels in the well to measure the water levels to full recovery. The well reached 95% recovery at approximately 02:30 on November 3, which is 9.5 hours from the end of the pumping test (see Figure 6).

3.4.4 Test Well 4

On November 3, 2022, Cambium staff arrived at the Site for a pumping test on TW4. Field staff named the well “West Pond” on the day of the investigation. This name was changed to TW4 after the field investigation was complete.

The Client had a pump installed in the well already for irrigation use for the golf course. The pump was set at a depth of approximately 18 mbgs. A pressure transducer Levelogger was installed above this depth to measure water levels within the well. Water levels were also measured manually to mitigate against potential equipment failure. Disinfectant bleach was added to the well water prior to testing, on October 31, 2022. The discharge end of the hose was disinfected by Cambium staff.

The well casing stickup of TW4 was measured as 0.37 m, therefore the static water level was calculated at 8.87 mbgs. Manual well depth was not measured in the field. The depth of the well from the MECP well record is approximately 19.8 mbgs. The available depth of drawdown was 8.8 m prior to the commencement of the pumping test.

A pumping test for TW4 was commenced at 8:33 on November 3, 2022. The flow was set to a constant rate of 22.7 L/min (5 igpm) for the duration of the 6-hour test.

Water levels were measured in test wells TW1 to TW4 and the two monitoring wells (MW1 and MW2) during the pumping of TW4. The water levels were recorded using pressure transducers and measured manually on hourly intervals. Additionally, every hour turbidity and residual chlorine measurements were measured for the pumping well by Cambium staff.

The discharge outlet was located approximately 15 m to the east of TW4 into a pond on the Site. The pump was turned off at 14:33 and the well recovery was monitored manually until 15:58 at approximately 95% recovery in 1 hour and 25 minutes.

3.4.5 Test Well 5

On November 23, 2022, Cambium staff arrived at the Site for a pumping test for TW5. The pump was set to a depth of 29 mbgs. A pressure transducer Levelogger was installed above this depth to measure water levels within the well. Water levels were also measured manually

to mitigate against potential equipment failure. Disinfectant bleach was added to the well water prior to testing. The end of the hose was disinfected by Cambium staff.

The static water level of well TW5 was 4.58 mbtoc. The well casing stickup of TW4 was measured as 0.65 m, therefore the static water level was calculated at 3.93 mbgs. Manual well depth was measured at 31.92 mbtoc. Cambium staff set up the pump at approximately 29.0 mbtoc.

A pumping test for TW5 was commenced at 11:13 on November 23, 2022. The flow was set to a constant rate of 24 L/min for the duration of the 6-hour test.

Water levels were measured in TW2, TW3, and TW4 during the pumping of TW3. The water levels were recorded using pressure transducers for TW3 and TW4 and measured manually on hourly intervals for TW2, TW3, and TW4. Additionally, every hour turbidity and residual chlorine measurements were measured for the pumping well by Cambium staff.

The discharge outlet was located approximately 30 m to the southeast of TW5 into an area that was topographically lower than the test well. The pump was turned off at 17:13 and the well recovery was monitored manually until 18:58 at approximately 91% recovery in 1 hour and 45 minutes.

3.4.6 Groundwater Quality Sampling

Each test well was disinfected prior to sampling between October 31 and November 3, 2022, and on November 23, 2022.

Each test well was pumped until there was no residual chlorine in the discharge water, prior to collecting the water quality samples. Groundwater samples were taken from each test well in the last half hour of the pumping tests. The samples were collected from the disinfected outlet hose and handled using nitrile gloves. The samples were put on ice in a sample cooler provided by SGS Canada Inc. in Lakefield, Ontario. Samples were stored at a temperature between 0°C and 10°C prior during transport to SGS.

The samples were submitted to SGS Canada Inc. for analysis of the physical, general chemical, and microbiological parameters in Guideline D-5-5. SGS is certified by the Canadian Council of Independent Laboratories (CCIL).

4.0 Results

4.1 Subsurface Conditions

The results of the geotechnical investigation indicate that the developable area of the Site is characterized by relatively shallow overburden. Where present, dark brown topsoil overlies glacial till deposits, which, in turn, overlie the limestone and granite formations encountered during test wells drilling. All test pits were open and dry upon the termination on bedrock.

The till is generally composed of either cohesive or non cohesive glacial deposits. Non-cohesive soils were predominantly sandy silt to silty sand, and the cohesive deposits were composed of brown clayey silt with trace sand and noted trace gravel in some locations. Cobbles and boulders were encountered in within the glacial till deposits.

Grey, weathered and fractured limestone bedrock was encountered at all the test pit locations, ranging in depth from 0 mbgs (outcropping at ground surface) to a depth of 1.35 mbgs. Test pits that had bedrock at ground surface were localized to the northwestern and western portions of the developable area and included TP104-22–TP107-22 and TP112-22 (Figure 3).

Fissures were noted on the bedrock surface following excavation of the test pits at seven locations located along the western edge of the developable area (TP104-22 through TP107-22, TP112-22, TP114-22, and TP115-22). The fissures measured approximately 0.2 m in width, based on field observations, and may be indicative of localized karst topography.

For a more detailed description of the subsurface investigation, see the attached test pit logs (Appendix B) and the companion geotechnical investigation report (Cambium, 2023). Cadmium notes in the geotechnical investigation report that the extent of the fissures underlying septic beds can be investigated to determine design restrictions for the septic system and groundwater supply wells. If supplemental work is done as a part of the geotechnical investigation in the western site area, Cambium can incorporate the new information into a revised hydrogeological assessment.

4.1.1 Grain Size Analysis

Laboratory particle size distribution analyses were completed on seven samples of the native soil taken from the boreholes and depths shown in Table 2. The grain size distribution results are provided in Appendix D.

Table 2 Grain Size Analysis Results

Test Pit	Depth (mbgs)	Soil	% Gravel	% Sand	% Silt	% Clay	T-Times (min/cm)
TP102-22, GS2	0.30-0.40	Clayey silt, trace sand	0	5	69	26	45
TP103-22, GS2	0.30-0.40	Sandy silt, some gravel, some clay	11	26	52	11	30
TP124-22, GS2	0.25-1.10	Silty gravel, some clay, trace sand	50	7	26	17	20
TP125-22, GS2	0.25-0.65	Silt and clay, some sand, trace gravel	1	11	46	42	>50
TP126-22, GS2	0.25-1.10	Sandy gravel, some silt, trace clay	54	28	10	8	10
TP129-22, GS1	0.00-0.45	Sandy silt, trace clay, trace gravel	1	28	63	8	25
TP131-22, GS2	0.20-0.40	Silty sand, some clay	0	51	32	17	35

The soil percolation rates ranged from 10 min/cm to >50 min/cm. The geometric mean of the percolation rate was estimated at 27.5 min/cm. These results indicate a moderate to low infiltration capacity of the native soils, depending on whether the coarse-grained till or fine-grained unit is encountered.

4.2 MECP Well Records Assessment

The MECP Water Well Information System (WWIS) database was accessed to review water well records located within 500 m of the Site.

A total of 23 water well records were located within 500 m of the Site, as shown on Figure 2. The water well records are attached in Appendix E. All 23 well records were listed as supply wells with varying uses which include domestic, commercial irrigation, or pubic. Further details are summarized in Table 3, below.

Table 3 Summary of Surrounding Water Well Record Information

		Total Depth (mbgs)	Depth Water Encountered (m)	Static Water Level (mbgs)	Recommended Pumping Rate (L/min)
Bedrock Wells Count: 23	Min	10.1	6.7	0.0	2.0
	Max	91.4	91.0	17.0	73.0
	Avg	42.9	35.8	7.4	32.3

All of the searched and recorded wells are used as water supply wells.

The records indicate that all the water wells are installed in fractured limestone or granite bedrock. This is consistent with the thin overburden cover in the region. Bedrock was encountered from surface level to a depth of 13.7 mbgs, with an average of 1.7 mbgs. Bedrock wells varied in depth from 10.1 mbgs to 91.4 mbgs and were on average 42.9 mbgs deep.

The static water levels varied from 0 mbgs to 17.0 mbgs. The average static water level was 7.4 mbgs. The recommended pumping rate for the bedrock supply wells range from 2.0 litres per minute (L/min) to 50 L/min, with a geometric mean of 32.3 L/min.

The water bearing fractures were encountered between the depths of 6.7 mbgs to 91.0 mbgs, with an average depth of approximately 35.8 mbgs. There was no significant correlation between fracture depth and flow rate. The number of fractures encountered during the installation of bedrock wells, at various depth ranges, were summarized below in Table 4.

Table 4 Fracture Depths

Fracture Depth Ranges (mbgs)	Number of Fractures Encountered
0 - 10	2
10 - 20	8
20 - 30	2
30 - 40	2
40 - 50	2
50 - 60	2
60 - 70	2
70 - 80	1
80 - 90	1
90 - 100	1

4.3 Hydrogeological Conditions

All wells within the monitoring network are completed in granite bedrock aquifers. The static water level, top of well casing, and ground surface elevations are presented in Table 5.

Similar to the variable fracture depth noted in the off-site MECP well records, fractures where water was first found in the test wells ranged from 7.6 mbgs for TW5 to 91.0 mbgs for TW1. Therefore, it is not assumed that the bedrock wells are completed in the same aquifer or are hydraulically connected. Rather, groundwater flow was inferred based on the observed relationship between topography and the static water levels in the wells (Table 5).

Table 5 Test Well and Monitoring Well Information

Well		TW1	TW2	TW3	TW4	TW5	MW1	MW2
Top of Pipe Elevation (masl)		107.79	110.92	102.94	104.53	103.64	108.00	103.34
Ground Surface Elevation (masl)		107.19	110.54	102.68	104.16	102.99	107.36	102.97
Stick-up (m)		0.60	0.38	0.26	0.37	0.65	0.64	0.37
October 31, 2022	Water Level (mbgs)	8.75	8.77	4.88	8.87	-(1)	8.83	5.42
	Groundwater Elev.(masl)	98.44	101.77	97.78	95.28	-(1)	98.52	97.54
November 1, 2022	Water Level (mbgs)	8.73	8.82	4.90	8.87	-(1)	8.46	5.41
	Groundwater Elev.(masl)	98.46	101.71	97.76	95.28	-(1)	98.89	97.55
November 2, 2022	Water Level (mbgs)	8.78	9.00	4.96	8.87	-(1)	8.47	5.43
	Groundwater Elev.(masl)	98.41	101.53	97.70	95.28	-(1)	98.88	97.53
November 3, 2022	Water Level (mbgs)	8.76	8.92	4.94	8.87	-(1)	8.71	5.46
	Groundwater Elev.(masl)	98.43	101.61	97.72	95.28	-(1)	98.64	97.50
November 23, 2022	Water Level (mbgs)	-(2)	9.05	-(2)	8.91	3.92	-(2)	-(2)
	Groundwater Elev.(masl)	-(2)	101.48	-(2)	95.24	99.07	-(2)	-(2)

1. *TW5 installed after the October 31 – November 3 monitoring, therefore manual measurements were not possible.*
2. *TW5 pumping test on November 23, 2022, only monitored TW2, TW4 and TW5.*

The topographic high of the development area corresponds to the highest recorded static water levels (in TW2). The well is located on a crest that slopes down to the northwest, west, and southwest toward the east boundary of the developable area and the unevaluated wetland in the center of the Site. The remaining wells were installed at lower elevations and have correspondingly lower static water levels. Therefore, groundwater flow in the granite bedrock is inferred to follow topography.

5.0 Wastewater Assessment

As per Guideline D-5-4 Technical Guideline for Individual On-Site Sewage Systems: Water Quality Risk Assessment (MECP, 1996) an assessment was completed to determine the feasibility of utilizing on-site sewage disposal for the development.

Guideline D-5-4 requires the septic effluent plume at the Site boundary to be less than the Ontario Drinking Water Quality Standards (ODWQS) limit of 10 mg/L for nitrate to prevent contamination of adjacent properties. Although natural processes and soil interaction can result in nitrate being attenuated in the receiving aquifer system, Guideline D-5-4 states that only dilution can be used as the attenuation mechanism to predict future nitrate concentrations. As such, a mass balance calculation is used to predict the impact of developing residential lots on the Site.

5.1 Available Dilution

The total available dilution for the Site is estimated by the following equation:

$$Qi = A \times S \times I$$

Where: Qi – Volume of Available dilution water

A – Area of the Site

S – Water surplus

I – Infiltration factor

To calculate the water surplus, the thirty year climate normal data collected between 1981 and 2010 at the Peterborough Trent U (ID 6166455) weather station was used. The data was accessed through the Environment Canada website (Environment Canada, 2022).The total yearly precipitation, on average, was 882 mm.

The Thornthwaite method was used to determine the amount of evapotranspiration that will occur at the Site (S. Lawrence Dingman, 2008). The calculated depth of evapotranspiration was 527 mm/year and the water surplus was calculated to be 355 mm per year (0.974 mm/day). The evapotranspiration calculations are attached in Appendix F.

To determine the fraction of surplus water that infiltrates into the soils at the Site, the volume of surplus water is multiplied by an infiltration factor. The infiltration factor varies between 0 and 1 and is estimated based on topography, soils, and cover as per the Stormwater Management Planning and Design Manual (Ministry of the Environment, 2003).

In addition to calculating the infiltration factor, the areas of the proposed development and nondevelopment areas were measured to determine the total volume of available dilution water generated in each portion of the Site. From the development plan, the total development area is 268,000 m^2 and the non development area is 956,918 m^2.

The volume of dilution water was calculated based on the post-development permeable area. The areas of the roads and standing surface water were assumed to be impermeable. For road areas, water was assumed to run-off towards the permeable areas of the Site. The proposed roofed area was included in the permeable area as it is assumed that roof leaders will direct any roof runoff to landscaped areas as is typical in rural subdivisions and therefore will not contribute to a post-development recharge deficit.

The non infiltrating area for the development area was determined to be 39,603 m^2, based on the road area and stormwater pond area in the concept plan. The non-infiltrating area for the nondevelopment area was determined to be 478,158 m^2, based on surface water and wetland areas in the concept plan.

The calculations of the available dilution water for each portion of the Site are outlined below Table 6.

Table 6 Available Dilution Calculations

Infiltration Factor				
	Development Area			Non-Development Area
Topography	Flat land = 0.3			Flat land = 0.3
Soil	Medium combinations of clay and loam = 0.2			Tight impervious clay = 0.1
Cover	Cultivated and woodland mix =0.15			Cultivated=0.1
Infiltration Factor (I)	0.65			0.50
Volume of Precipitation Water				
Parameter	**Symbol**	**Units**	**Development Area**	**Non-Development Area**
Dilution Area	A	m^2	228,397	472,925
Surplus	S	m/day	0.000973	0.000973
Volume of Surplus Water (Per Day)	A * S	m^3	222.14	459.96
Volume of Available Dilution Water (Per Day)	A * S * I	m^3	144.39	229.98
Volume of Runoff Water (Per Day)	A * S * (1-I)	m^3	77.74	229.98

5.2 Predictive Assessment

As per the procedure in Guideline D-5-4, a nitrate loading of 40 grams/lot/day is required to simulate the effluent loading from conventional septic systems on the receiving groundwater system. Total nitrogen (all species) ultimately converts to nitrate through the wastewater treatment process, so nitrate is the critical contaminant in sewage effluent. Each proposed lot is anticipated to generate an average discharge of 1,000 L/day of sewage effluent which contributes to the dilution of the total nitrate load.

To determine if the proposed lot density is adequate for nitrate dilution, a mass balance calculation is used to determine the sewage loading for nitrate on the property boundary. The mass balance calculations are outlined below as:

$$Q_tC_t = Q_eC_e + Q_iC_i$$

Where: Q_t = Total volume ($Q_e + Q_i$)

C_t = Total concentration of nitrate at the property boundary

Q_e = Volume of septic effluent

C_e = Concentration of nitrate in effluent (40 mg/L)

Q_i = Volume of available dilution water

C_i = Concentration of nitrate in dilution water (0.1 mg/L)

To determine the concentration of nitrate at the property boundary (C_t), the above mass balance equation can be arranged as follows:

$$C_t = \frac{Q_e C_e + Q_i C_i}{Q_t}$$

This equation was used to determine the dilution of wastewater by including infiltration on both the developable and non-developable portions of the Site. The results of the equation have been outlined in Table 7 below:

Table 7 Predictive Assessment of Nitrate Concentration

Variable	Value
Number of Lots	60
Q_e (L)	60,000
C_e (mg/L)	40
Q_i (L)	374,375
C_i (mg/L)	0.1
Q_t (L)	434,375
C_t (mg/L)	**5.53**

At the time of the assessment, the proposed development includes the construction of 58 new residential dwellings and 1 commercial lot to be developed in the future. The existing lot to the north will remain residential.

The predicted nitrate concentration at the Site boundary based on this 60-lot density using the calculated dilution volume, is 5.53 mg/L, which is less than the maximum allowable limit of 10 mg/L. Therefore, the Site can accommodate the proposed 59 new lots according to Guideline D-5-4.

The actual nitrate concentration is anticipated to be even lower due to the natural attenuation that will occur within the soil since this calculation only assumes dilution. In addition,

conservative estimates were used for infiltration factors for the non development area with the limited information on soil characteristics in the area.

5.3 Conceptual Wastewater Design

Section 8 of the *Ontario Building Code* (OBC) details the design, construction, operation, and maintenance of sewage systems. No proposed lot specific development information is available at this time. As such, the following assumptions were used in the conceptual on-site sewage system design:

- Four-bedroom dwelling.
- Percolation rate of >50 min/cm (accounts for worst-case soils)
- Minimum lot area of 3,000 m^2 (Lot 18 and Lot 21)

According to Table 8.2.1.3.A of the OBC, a four-bedroom dwelling has a daily sewage design flow volume of 2,000 L/day. Based on the design flow for residential occupancy, the proposed septic tank capacity was calculated as follows in accordance with section 8.2.2.3. of the OBC:

Volume (V): $V = 2 * Q$

$V = 2 * 2{,}000\ L$

$V = 4{,}000\ L$

A single two compartment septic tank with capacity of 4,500 L would be suitable to achieve the minimal capacity requirements.

The estimated percolation times from the soil samples for the proposed lots across the Site were between 10 and >50 min/cm. A percolation rate of 50 min/cm was considered as a worst case.

Furthermore, bedrock was encountered at depths ranging from ground surface to 1.35 mbgs. A conventional leaching bed will require a minimum vertical separation of 0.9 m between the bedrock contact as per the OBC; as such, the proposed leaching beds may be required to be either partly or fully raised. An advantage of partially or fully raised filter beds with a minimum

vertical separation of 0.9m is that it mitigates some of the risk of the isolated fractured bedrock in the western portion of the proposed development area.

Considering worst-case conditions (T>50 min/cm, bedrock at the surface, and the smallest proposed lot of 3,000 m^2), a conceptual sewage system design using a raised filter bed was explored. The total required footprint is determined by the allowable sewage loading rate based on Table 8.7.4.1. of the OBC. Using a soil percolation time of 50 min/cm, the maximum loading rate is 4 L/m^2/day, the following calculations described the required footprint of the conceptual filter bed components:

Effective Filter Area: $A = Q / 75$

$A = (2{,}000\ L/d) / 75$

$A = 26.7\ m^2$

Loading Area: $A = Q / LR$

$A = (2{,}000\ L/d) / (4)$

$A = 500\ m^2$

Based on a daily sewage design flow of 2,000 L/day, the loading area (total footprint) of the proposed raised leaching bed needs to be a minimum of 500 m^2. Considering worst-case percolation rates for soils and the lot with the smallest area, 2,500 m^2 would remain for the development of a residential dwelling.

The large area of the Site will provide adequate space for the installation of on-site wastewater treatment systems and should be able meet the required setback distances (i.e., structures, property lines, wells etc.) outlined in OBC Tables 8.2.1.6.A and 8.2.1.6.B. However, each lot should be considered and evaluated independently for each Site-specific sewage system design. The Site conditions appear feasible to install on-site wastewater systems.

6.0 Water Supply Assessment

6.1 Hydraulic Pumping Test Results

Table 8 provides a summary of the key parameters measured during the pumping tests including pumping rates, well details, and recorded final drawdowns at each well.

Table 8 Pumping Test Details

Well Identification	Pump Depth (mbtoc)	Pumping Rates (L/min)	Static Water Level (mbtoc)	Observed Drawdown (m)	Available Drawdown (m)
TW1	38	16	9.35	2.28	28.7
TW2	84	14	9.20	39.89	74.8
TW3	12	22.7	5.23	1.17	6.8
TW4	18	22.7	9.24	1.98	8.8
TW5	29	24	4.58	1.34	24.4

Note: mbtoc – metres below top of casing

Based on the data above, the drawdown in the wells during a 6-hour pumping test ranged from 1.17 m to 38.89 m, while the available drawdown in the wells at respective pump set depths ranged between 6.8 m to 74.8 m.

6.1.1 TW1 Pumping Test – Test Well 1

The water level drawdown and recovery curve of the pumping test are outlined on Figure 4. During the pumping test the water level lowered from 9.35 mbtoc to 11.63 mbtoc (a drawdown of 2.28 m) at the time the test was concluded (16:43). In total, 5,790 L of water was withdrawn from well TW1 during the pumping test.

The water level recovery was monitored manually until 17:43, allowing for approximately 97% recovery. The data logger captured the remaining recovery after Cambium left the Site.

The water withdrawal rate of well TW1 was demonstrated to be sustainable upon completion of TW1 Pumping Test (see Section 6.2).

6.1.1.1 Monitoring Well Influences

Water level fluctuations of all other monitored wells (TW2 to TW4, MW1 and MW2) during the test are outlined on Figure 4. There was no water level response noted at TW2–TW4 or MW2 during the TW1 pumping test on October 31, 2022. This can be seen as on Figure 4 from the straight-line response shown in the monitoring well water levels during the pumping of TW1.

From the logger data, the water levels at MW1 appears to show fluctuations at 11:00, 12:58, 13:36, and 16:09 during the pumping test at TW1. It is Cambium's opinion that domestic water use was the cause of these fluctuations as the sudden drops and subsequent recoveries in water level are consistent with intermittent residential well use rather than increasing drawdown from the pumping test.

In summary, the water withdrawal from TW1 on October 31, 2022, did not induce a measurable water level response at any of the monitored wells.

6.1.2 Pumping Test – Test Well 2

The water level drawdown and recovery curve of the pumping test are outlined on Figure 5.

During the pumping test the water level lowered from 9.2 mbtoc to 49.1 mbtoc (a drawdown of 39.9 m) at the time the test was concluded (15:30). In total, 5,040 L of water was withdrawn from well TW2 during the pumping test.

The water level recovery was monitored manually until 17:00, allowing for approximately 98% recovery. The data logger captured the remaining recovery after Cambium left the Site.

The water withdrawal rate of well TW2 was demonstrated to be sustainable upon completion of TW2 Pumping Test (see Section 6.2).

6.1.2.1 Monitoring Well Influences

Water level fluctuations of all other monitored wells (TW1, TW3-TW4, MW1-MW2) during the test are outlined on Figure 5. There was no observed influence on monitoring well water levels in TW1, TW3-TW4, MW1-MW2 during the duration of the pumping test. The drawdown graph

for the monitoring wells shows a straight-line relationship for all of the wells indicating no water level fluctuation due to the pumping of TW2.

From the logger data, the water levels at MW1 appears to show a lowering of 0.80 m at 17:30. This is attributed to domestic water use which occurred after the pumping test concluded. Logger data for TW1 show a 1.57 m sudden drawdown change at 9:34 which returned to static at approximately 9:42. This rapid change in water level corresponds with the time period the Client told Cambium staff that they pulled the TW1 pump from the well used for pumping test on October 31, 2022, to return the well to a functioning condition for the homeowner. The Client advised Cambium the pump was pulled between the times of 9:15-10:00 and that the logger got caught and pulled up with the pump during this time. The Client returned the logger once it was found to be moved with the pump.

In summary, the water withdrawal from TW2 on November 1, 2022, did not induce a measurable water level response at any of the monitored wells.

6.1.3 Pumping Test – Test Well 3

The water level drawdown and recovery curve of the pumping test are outlined on Figure 6.

During the pumping test the water level lowered from 5.23 mbtoc to 6.40 mbtoc (a drawdown of 1.17 m) at the time the test was concluded (16:00). In total, approximately 8,183 L of water was withdrawn from TW3 during the pumping test.

The water level recovery was monitored manually until 17:00 allowing for approximately 60% recovery with the data logger capturing the remaining recovery after Cambium left the Site. According to the logger data, well water levels returned to static conditions at approximately 02:30 on November 3, 2022, 9.5 hours after the end of pumping.

The water withdrawal rate of well TW3 was demonstrated to be sustainable upon completion of TW3 Pumping Test (see Section 5.6).

6.1.3.1 Monitoring Well Influences

Water level fluctuations of all other monitored wells (TW1 to TW2, TW4, MW1, and MW2) during the test are outlined on Figure 6. There was no observed influence in water levels for the other monitored wells during the duration of the pumping test. The drawdown graph for the monitoring wells shows a straight-line relationship for all the wells indicating no water level fluctuation due to the pumping of TW3.

The data on Figure 6 was extended to November 3, 2022, to show the recovery of TW3 after the pumping ceased and Cambium was no longer on-site to take manual measurements. From the logger data, the water levels at MW1 appears to show domestic water use which occurred after the pumping test concluded. Logger data for TW4 also shows an approximate 1.0 m drawdown at 17:47, which occurred after the test had concluded. Water was taken from TW4 at this time to pre-set the flow rate for the pumping test occurring for TW4 on November 3, 2022.

In summary, the water withdrawal from TW3 on November 2, 2022, did not induce a measurable water level response at any of the monitored wells.

6.1.4 Pumping Test – Test Well 4

The water level drawdown and recovery curve of the pumping test are outlined on Figure 7.

During the pumping test the water level lowered from 9.24 mbtoc to 11.22 mbtoc (a drawdown of 1.98 m) at the time the test was concluded (14:33). In total, approximately 8,183 L of water was withdrawn from well TW4 during the pumping test. The water level recovery was monitored manually until 15:58 allowing for 95% recovery.

The water withdrawal rate of well TW4 was demonstrated to be sustainable upon completion of TW4 Pumping Test (see Section 6.2).

6.1.4.1 Monitoring Well Influences

Water level fluctuations of all other monitored wells (TW1 to TW3, MW1, and MW2) during the test are outlined on Figure 7. There was no observed influence on monitoring well water levels

during the duration of the pumping test. The drawdown graph for the monitoring wells shows a straight-line relationship for all the wells indicating no water level fluctuation due to the pumping of TW4.

From the logger data, the water levels at MW1 appear to be recovering from domestic water use which occurred before the pumping test started. The MW1 well recovered back to static conditions at approximately 09:30 and remained at static conditions for the duration of the test. Logger data for TW1 also shows an approximate 1.2 m immediate step response at 10:57 and subsequent rapid increase back to static around 11:54. The step response occurred at the same time as Cambium took a manual water level measurement at 10:57. The logger rope got tangled in the well and had to be reinstalled back to the same level upon coming back to the well to take the next water level at 11:54. Therefore it is Cambium's opinion that the step response is not indicative of a hydraulic response to pumping, but rather captures the issue with the logger.

Overall, the water withdrawal from TW4 on November 3, 2022, did not induce a measurable water level response at any of the monitored wells.

6.1.5 Pumping Test – Test Well 5

The water level drawdown and recovery curve of the pumping test are outlined on Figure 8.

During the pumping test the water level lowered from 4.58 mbtoc to 5.92 mbtoc (a drawdown of 1.34 m) at the time the test was concluded (17:13). In total, approximately 8,640 L of water was withdrawn from well TW4 during the pumping test.

The water level recovery was monitored manually until 18:58 allowing for approximately 92% recovery.

The water withdrawal rate of well TW5 was demonstrated to be sustainable upon completion of TW5 Pumping Test (see Section 6.2).

6.1.5.1 Monitoring Well Influences

For the TW5 pumping test on November 23, 2022, TW2 and TW4 were used as monitoring wells to potential observe water level fluctuations. The drawdown curve for TW5 and water levels of TW2 and TW4 can be seen on Figure 8.

There was no observed influence on monitoring well water levels in TW2 and TW4, during the duration of the pumping test. The drawdown graph for the monitoring wells shows a straight-line relationship for TW2 and TW4 indicating no water level fluctuation due to the pumping of TW5.

The pumping of TW5 on November 23, 2022, did not induce a measurable water level response at any of the monitored wells.

6.2 Water Sustainability Discussion

The results of TW1 to TW5 pumping tests indicate that water withdrawal at the rates used did not influence adjacent wells. The absence of influences is outlined on Figure 4 to Figure 8. All pumping tests had pumping rates greater than the minimum requirement from Guideline D-5-5 of 13.7 L/min. Pumping tests for TW2 and TW3 did not reach steady state conditions, however, TW1, TW4 and TW5 appear to have plateaued close to approximate steady state conditions.

6.2.1 Minimum Yield Assessment

Guideline D-5-5 provides minimum daily yield rates for private supply wells intended to service single residential family dwellings. As per Guideline D-5-5, the per-person water requirement is referenced as 450 liters per day (L/day). Further, the number of people living in a dwelling is equal to the number of bedrooms plus one. The number of bedrooms is assumed to be 4, unless otherwise specified. As such, the total daily water withdrawal volume required is assumed to be 2,250 L/day (i.e., 5 people x 450 L/day). Regardless of this calculation, D-5-5 states that the minimum pumping rate shall not be lower that 13.7 L/min.

The daily minimum volume available from wells TW1 to TW5 is greater than 2,250 litres per day and all wells recovered to at least 95% of the pre-test static water level within 24 hours.

Therefore, the results of the TW1–TW5 pumping tests indicate that the wells could sustain the quantity of water required for the development of the Site.

6.3 Water Quality Results

Raw water samples were collected from each test well in the last half hour of the pumping test. Lab reports are included in Appendix G. All samples were submitted to SGS Canada Inc. in Lakefield for analysis of general organic and inorganic chemistry.

The water quality results were compared with ODWQS Tables (O. Reg. 169/03) as well as objectives in D-5-5 (Private Well: Water Supply Assessment (MECP, 1996)). Table 9, below, summarizes the parameters which exceeded the corresponding ODWQS operational guidelines or aesthetic objectives during sampling events in October and November 2022.

Table 9 Summary of Water Quality Parameter Exceedances

Parameter	Ontario Drinking Water Standard	TW1	TW2	TW3	TW4	TW5
Hardness	100 mg/L	**531**[(1)]	**515**	**345**	**375**	38.3
Sodium	20 mg/L as CaCO3	**56.9**	**64.2**	**3.12**	8.50	13
Total Dissolved Solids (TDS)	500 mg/L	-	**743**	420	477	494

1. *Bolded entries indicate parameters reported at concentrations greater than ODWQS Criteria*

In all samples, hardness comprises the largest component of total dissolved solids (TDS). Concentrations of hardness, sodium, and TDS in TW2 were greater than the ODWQS aesthetic objectives or operational guidelines. Hardness and sodium exceeded the applicable criteria in TW1. Although TW1 was not analyzed for TDS, similarities in chemistry between it and TW2 suggest that TW1 may also exceed the aesthetic objective for TDS.

Exceedances for hardness were reported for TW3 and TW4. TW5 had no reported exceedances.

Hardness, sodium, and TDS are parameters which may be naturally elevated in bedrock aquifers. Therefore, water quality should be confirmed for each lot prior to installation of a water supply and treatment system.

Measured concentrations of sodium in TW1 and TW 2 exceed the limit which serves as a warning to individuals on sodium restricted diets (20 mg/L). The concentration of sodium was less than the aesthetic limit and maximum concentration that is treatable (200 mg/L), which indicates that the water is still potable at the measured concentrations.

It will be the Client's duty to notify purchasers of the proposed lots that sodium may be present in groundwater at concentrations greater than 20 mg/L which would affect individuals on sodium reduced diets. This notification should be added to the title deeds for each applicable property.

Hardness can be amended with residential water treatment units such as water softeners. Use of water softeners using a sodium exchange resin to treat hardness could result in water with elevated sodium levels. If a sodium exchange method is used to reduce hardness, a separate tap which supplies unsoftened water should be installed for drinking at those lots with elevated sodium concentrations (MECP, 1996).

TDS is listed an aesthetic rather than a health-related criterion under the ODWQS. TDS does not have a maximum treatable concentration (MECP, 1996), but Guideline D-5-5 requires written rationale that corrosion, encrustation, or taste problems will not occur.

Since the TDS concentration at the Site is driven by hardness, treatment for hardness by removing calcium and magnesium from the water, as recommended above, should also reduce the reduce the corrosivity of water from the wells. However, given the elevated concentrations of sodium measured in some test wells, it is Cambium's recommendation that consideration should be given to systems that reduce hardness without a commensurate increase in sodium.

7.0 Conclusions and Recommendations

Conclusions and recommendations based on the results presented in this hydrogeological assessment are summarized below.

- The wastewater assessment indicates that the proposed development of 1 commercial lot and 58 lots with single family homes with private, on-site wastewater disposal, in addition to the existing residential development, would result in a nitrate concentration of 5.61 mg/L at the property boundary, which is less than the Ontario Drinking Water Quality Standard of 10 mg/L. The proposed development is therefore expected to maintain acceptable nitrate concentrations at property boundaries.
- The conceptual wastewater design indicates that shallow soils at the Site may require raised filter beds as part of the private wastewater systems. Single department septic tanks with a volume of 4,500 L would be appropriate for the minimum capacity requirement. The required footprint for a raised filter bed was calculated to be 500 m^2, leaving at least 2,500 m^2 of available area for building houses (estimated using the smallest proposed lot) Each lot should be considered and evaluated independently for each site-specific sewage system design.
- Raised filter beds could mitigate some risk associated with surface bedrock fissures observed in the western portion of the proposed development area during the geotechnical investigation by having a 0.9 m minimum vertical separation between the filter bed and bedrock contact.
- Hydraulic testing of TW1, TW2, TW3, TW4 and TW5 indicate the wells are able to produce sustainable yields greater than minimum 13.7 L/min requirement for the MECP Guideline D-5-5 assessment procedure. It is therefore determined that the granite aquifer at the Site can provide an adequate volume of water to supply the proposed development.
- Water quality results indicate the water from the test wells is of generally good quality, with the exceptions of hardness, sodium, and total dissolved solids. These parameters were reported at concentrations which exceed ODWQS objectives and guidelines; however, they

are all amendable with residential water treatment units. All other analyzed parameters were within acceptable ranges.

- It is noted that, although sodium concentrations are within aesthetic guidelines, they are present in quantities that exceed warning levels for individuals on sodium reduced diets. It will be the Client's duty to notify purchasers of the proposed lots that sodium may be present in groundwater at concentrations greater than 20 mg/L, which would affect individuals on sodium reduced diets.

8.0 Closing

We trust that the information in this submission meets your current requirements. If you have any questions regarding the contents of this report, please contact the undersigned.

Respectfully submitted,

Cambium Inc.

Warren Young, B.Eng., EIT
Junior Hydrogeologist / EIT

Kyle Horner, Ph.D., P.Geo.
Senior Hydrogeologist/Senior Project Manager

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10.0 Standard Limitations

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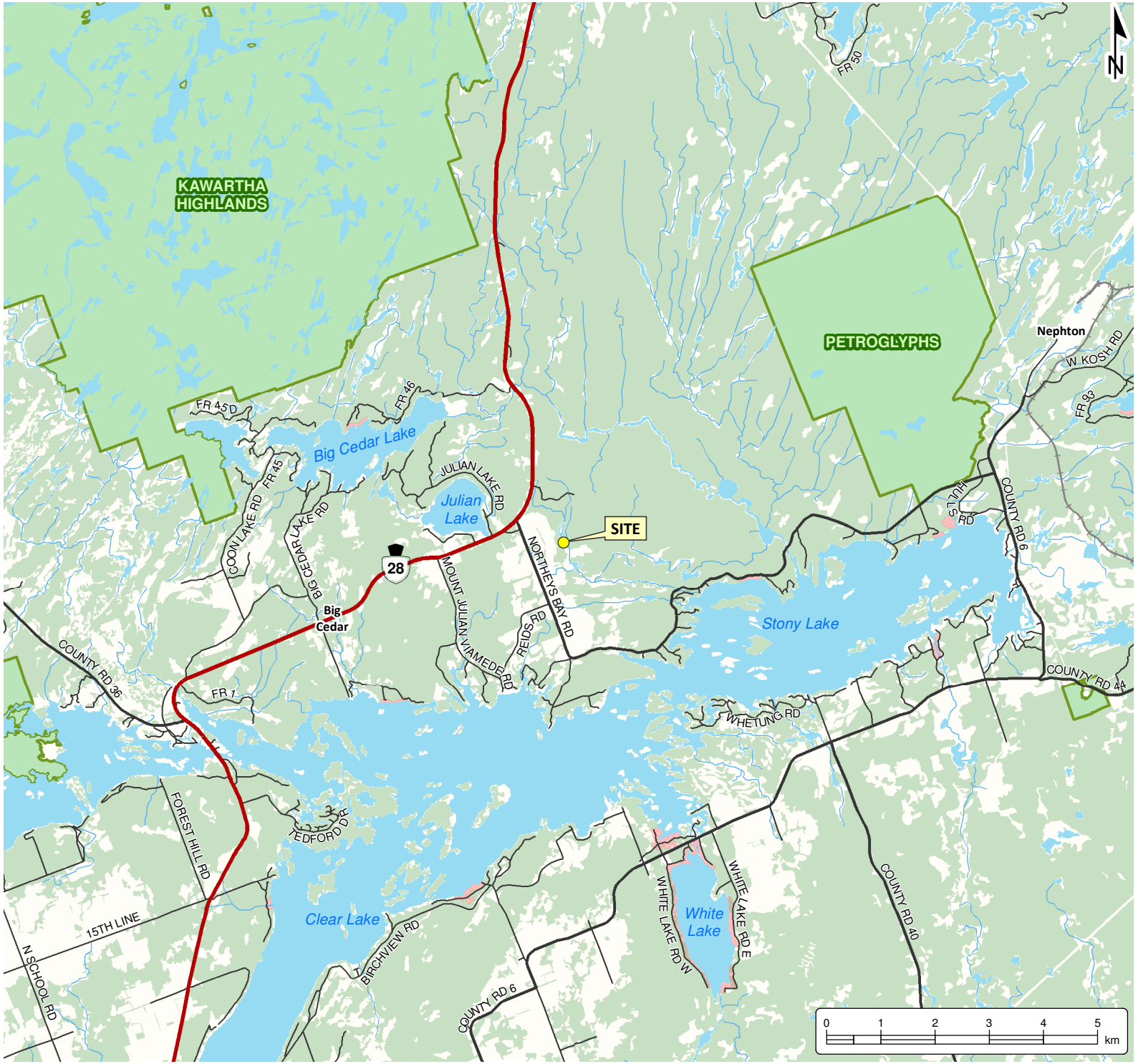
Figures

HYDROGEOLOGICAL ASSESSMENT

ERIC CHALLENGER
65 Northeys Bay Road,
Woodview, Ontario



LEGEND

- Highway
- Major Road
- Minor Road
- Railroad
- Watercourse
- Water Area
- Provincial Park
- Wooded Area
- Built Up Area

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.

CAMBIUM
194 Sophia Street
Peterborough, Ontario, K9H 1E5
Tel: (705) 742.7900 Fax: (705) 742.7907
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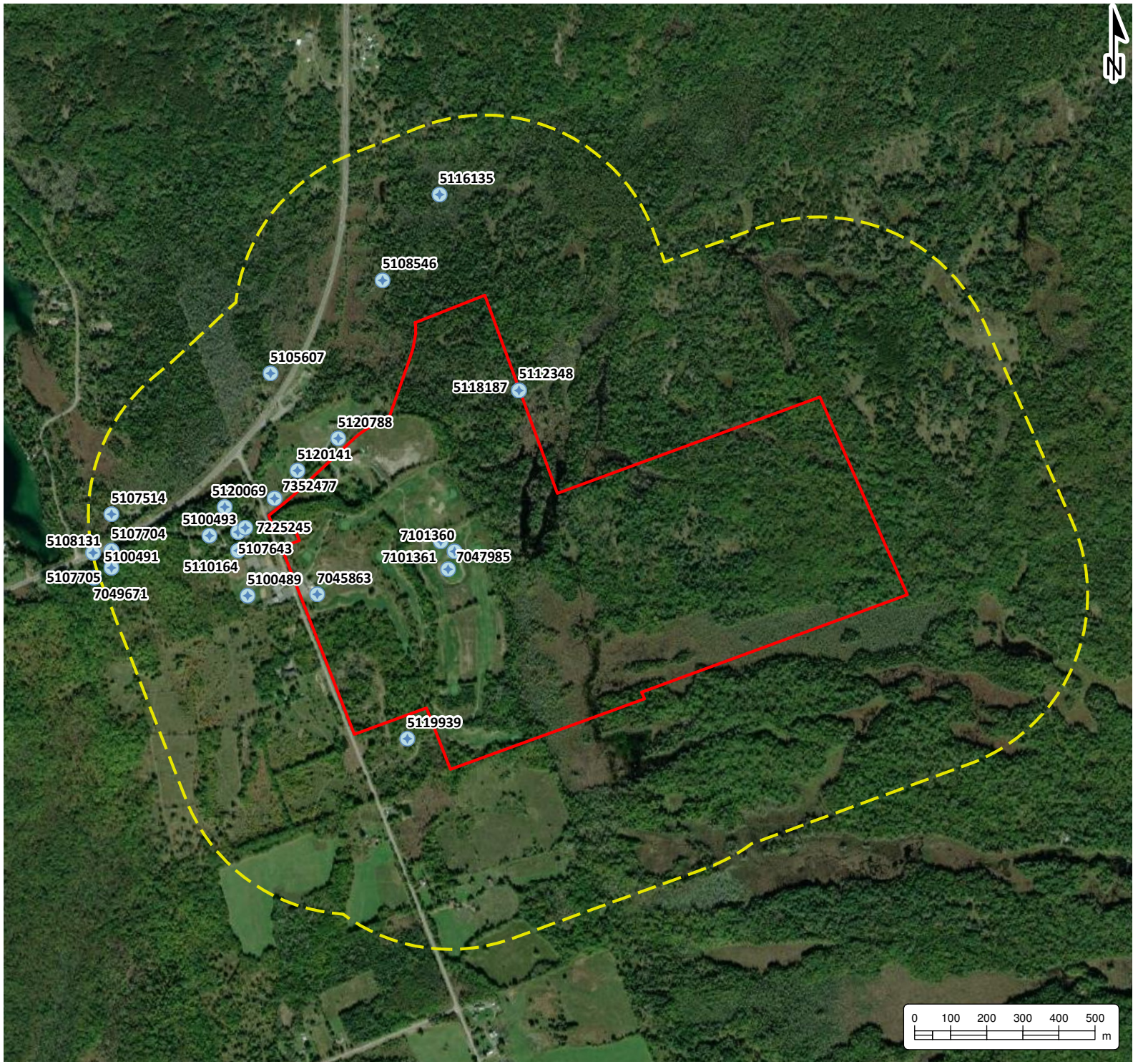
REGIONAL SITE LOCATION MAP

Project No.: 15101-001		Date: June 2023	Rev.:
Scale: 1:100,000		Projection: NAD 1983 UTM Zone 17N	
Created by: DBB	Checked by: KW	Figure: 1	

O:\GIS\MXDs\15100-15199\15101-001 Woodview Golf - Eric Challenger - Hydrog & Geo - Woodview Golf Subdivision\2022-12-21 FIG 1 - Regional Location Map.mxd



HYDROGEOLOGICAL ASSESSMENT

ERIC CHALLENGER
65 Northeys Bay Road,
Woodview, Ontario

LEGEND

- Water Well Records
- Study Area (500m)
- Site (approximate)

Notes:
- Benchmark is the steel foundation stick-up of the road sign for Highway 56 (shown on map labelled "SIGN"), with an assumed elevation of 100.0 m.
- 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.
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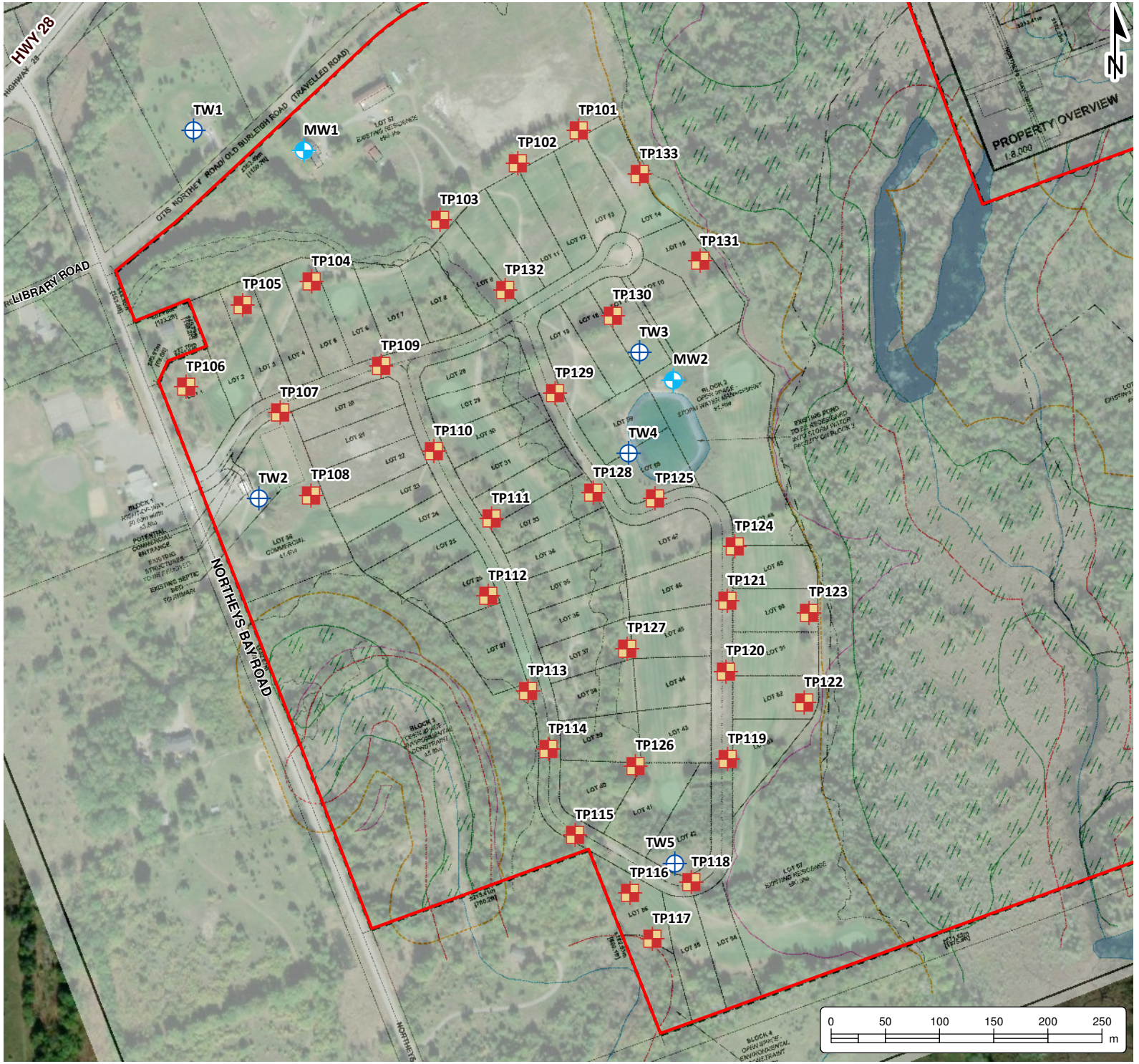
MECP WELL RECORDS

Project No.: 15101-001		Date: June 2023	Rev.:
Scale: 1:15,000		Projection: NAD 1983 UTM Zone 17N	
Created by: PAS	Checked by: KW	Figure: 2	

O:\GIS\MXDs\15100-15199\15101-001 Woodview Golf - Eric Challenger - Hydrog & Geo - Woodview Golf Subdivision\2022-11-25 FIG 3 - Well Record Map.mxd



HYDROGEOLOGICAL ASSESSMENT

ERIC CHALLENGER
65 Northeys Bay Road,
Woodview, Ontario

LEGEND

- Monitoring Well
- Test Pit
- Test Well
- Site (approximate)

Notes:
- Benchmark is the steel foundation stick-up of the road sign for Highway 56 (shown on map labelled "SIGN"), with an assumed elevation of 100.0 m.
- 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).
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TEST PIT AND TEST WELL LOCATION PLAN

Project No.: 15101-001		Date: June 2023	Rev.:
Scale: 1:5,000		Projection: NAD 1983 UTM Zone 17N	
Created by: DBB	Checked by: KW	Figure: 3	

O:\GIS\MXDs\15100-15199\15101-001 Woodview Golf - Eric Challenger - Hydrog & Geo - Woodview Golf Subdivision\2022-12-21 FIG 2 - Test Pit and Test Well Location Plan.mxd

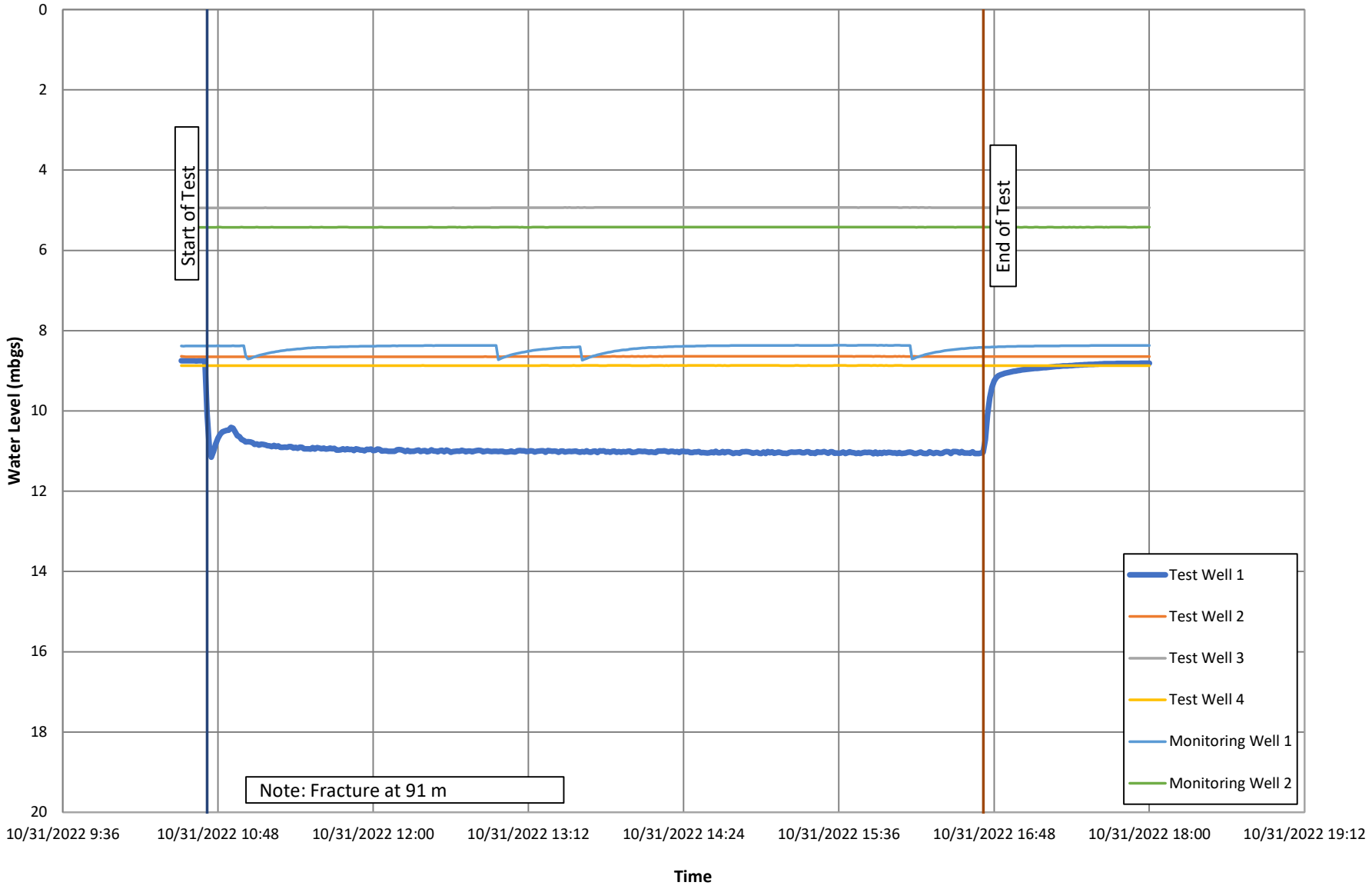


Figure 4: Pumping Test - Test Well 1

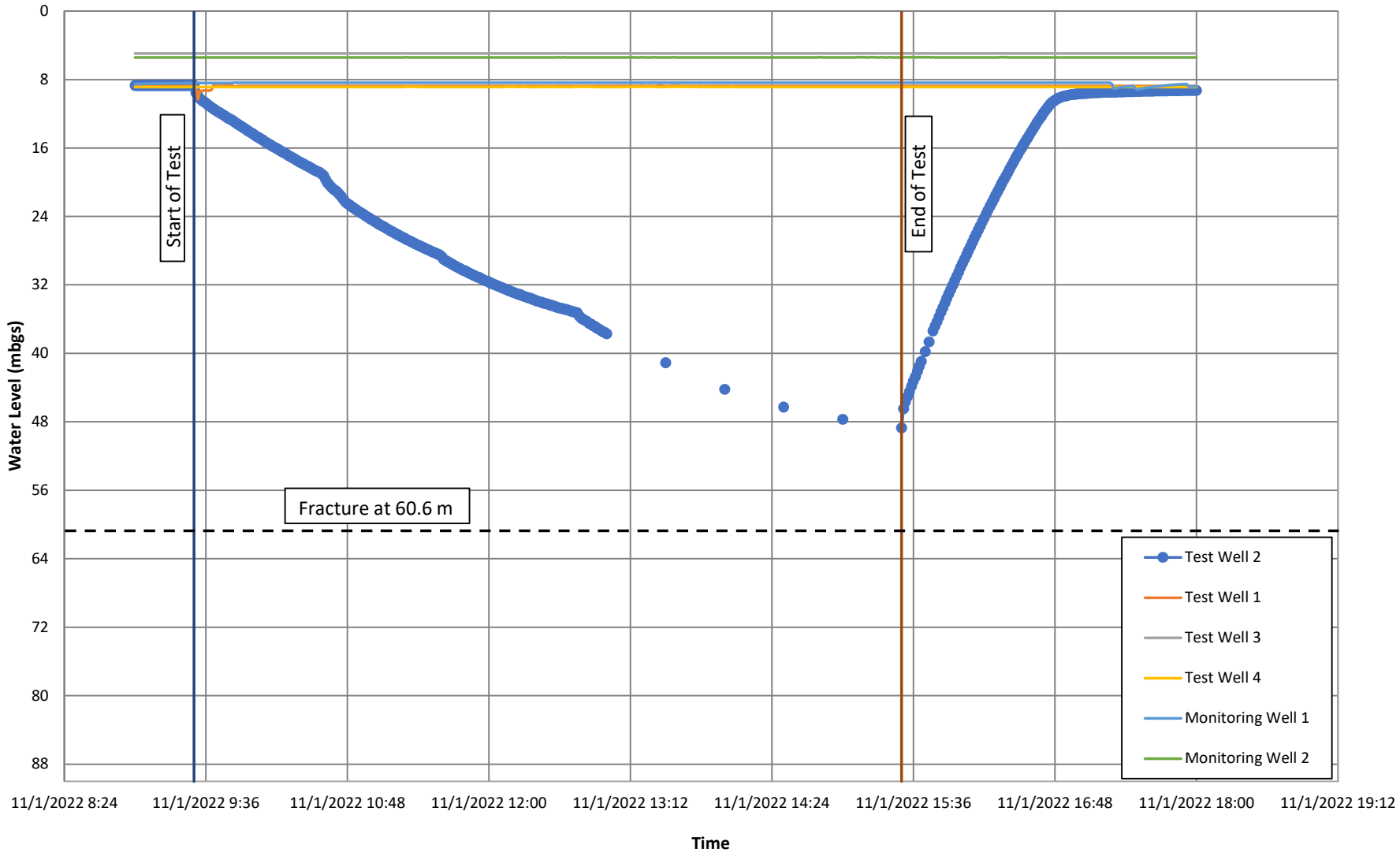


Figure 5: Pumping Test - Test Well 2

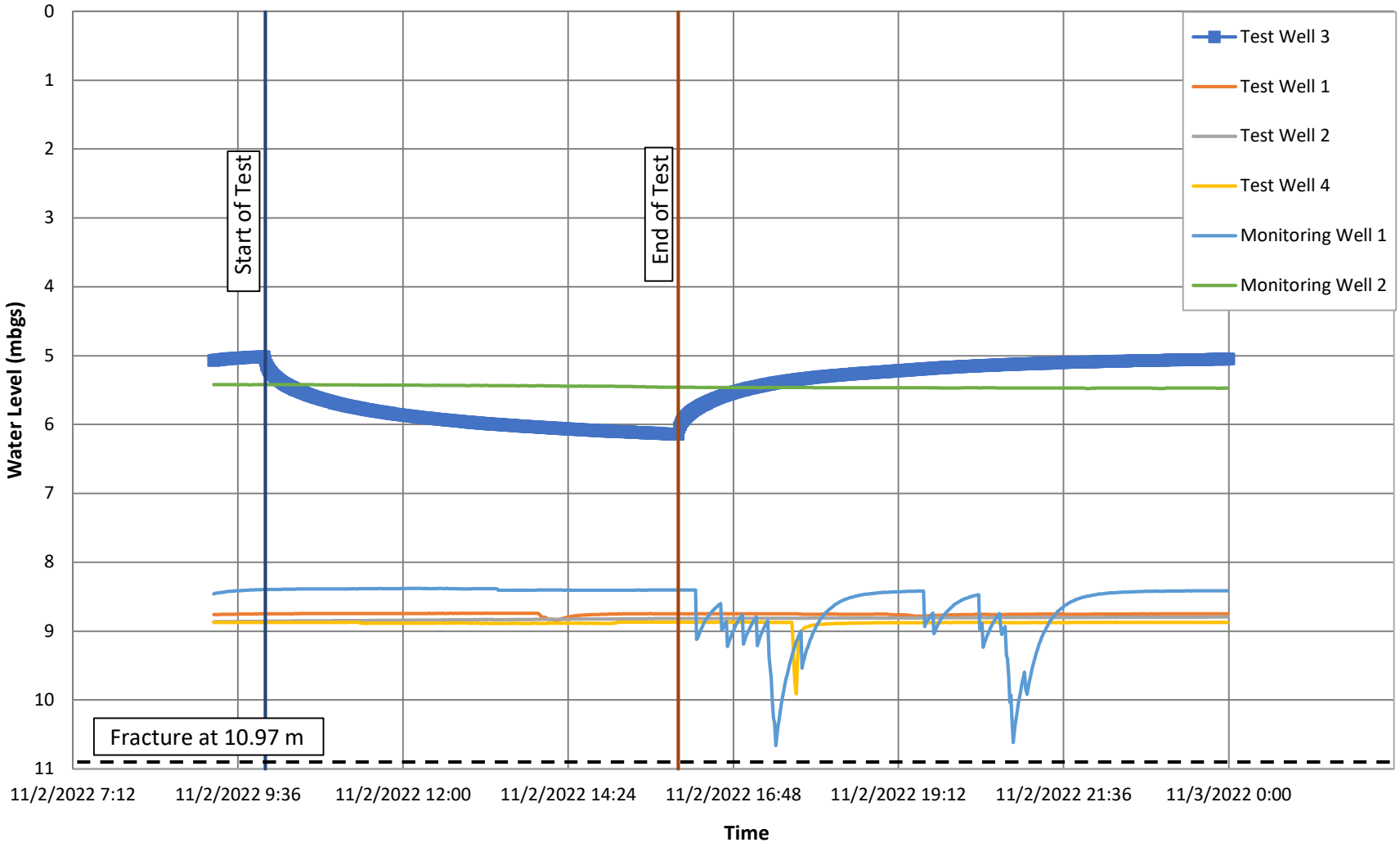


Figure 6: Pumping Test - Test Well 3

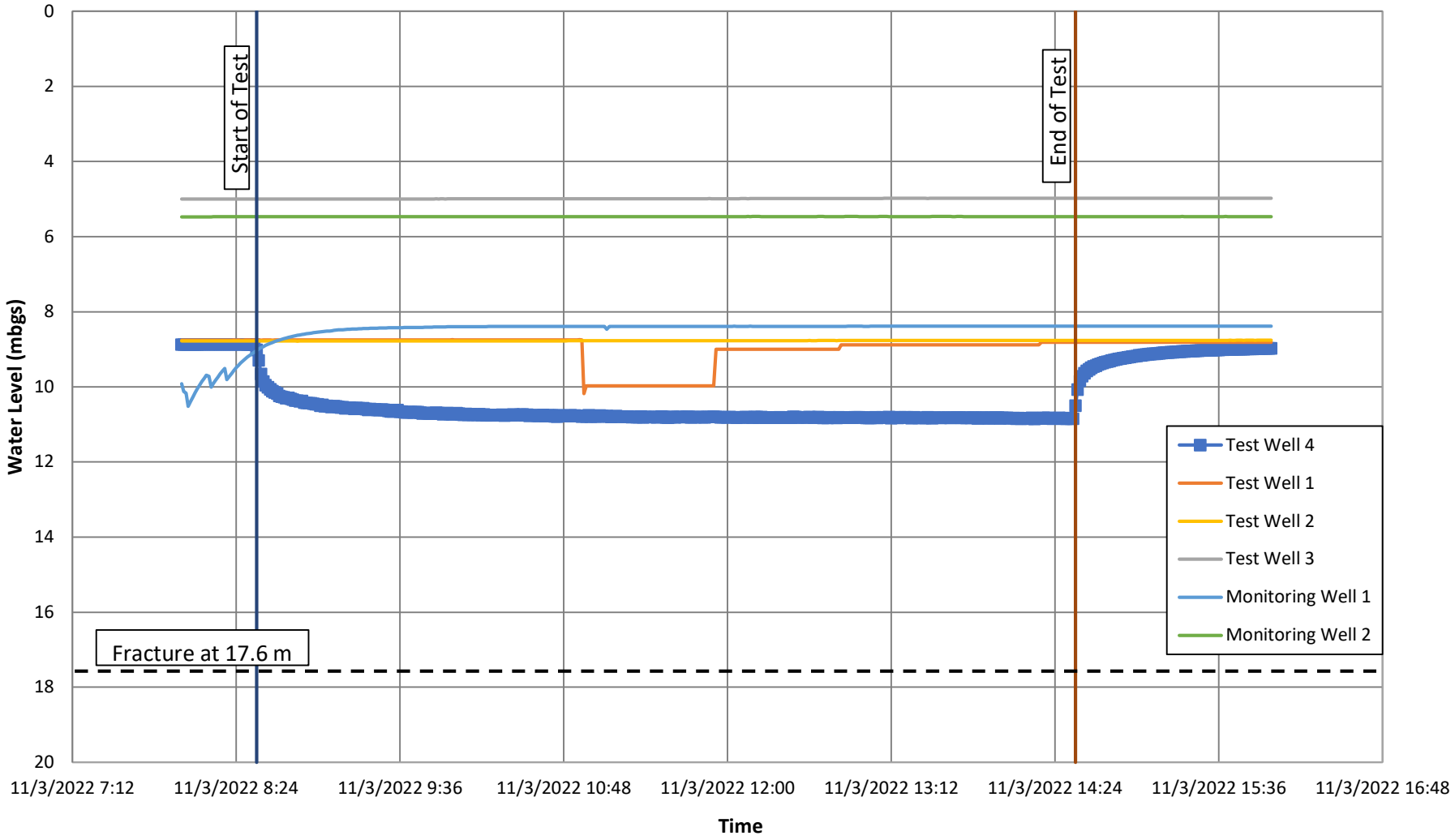


Figure 7: Pumping Test - Test Well 4

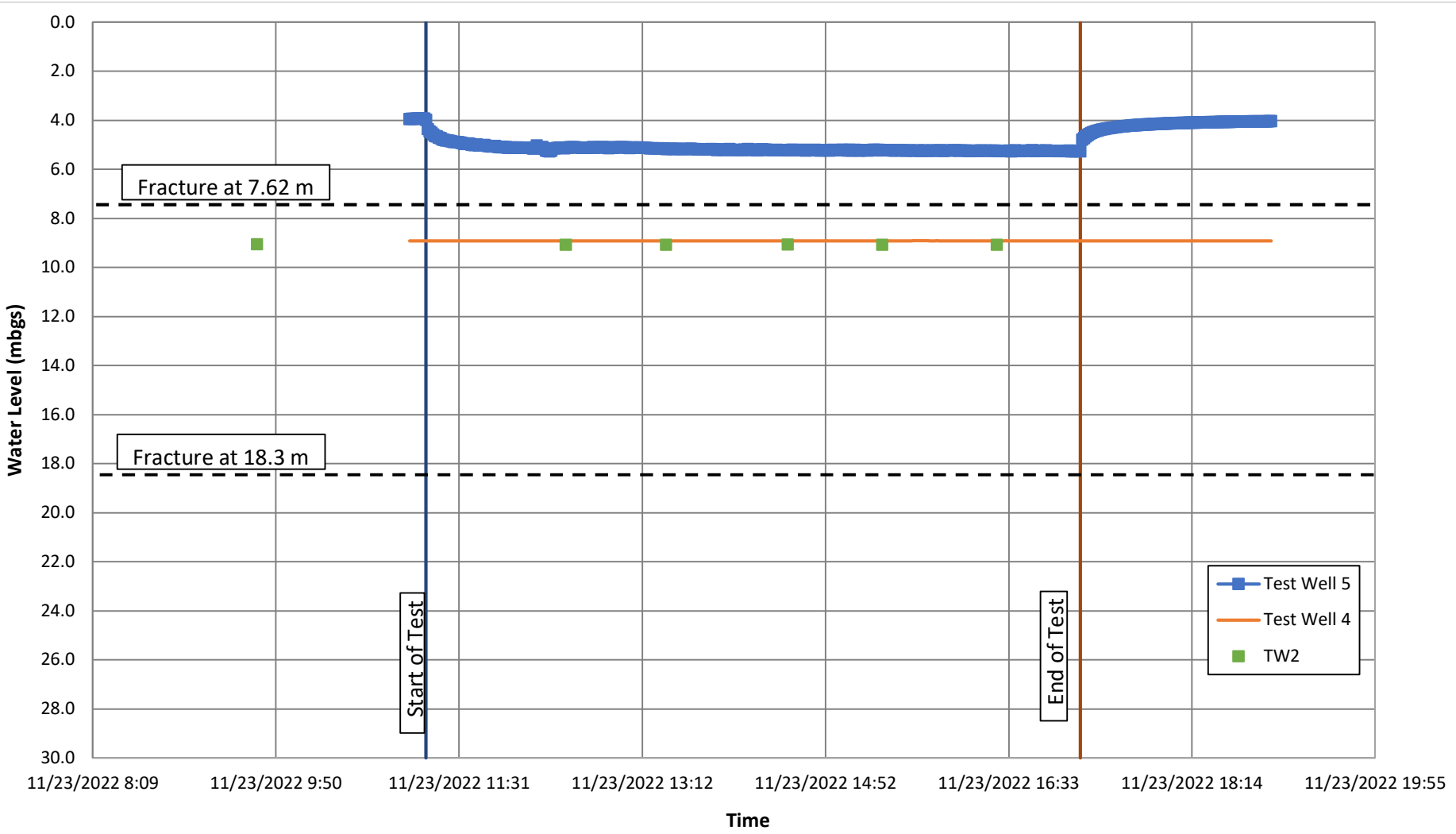
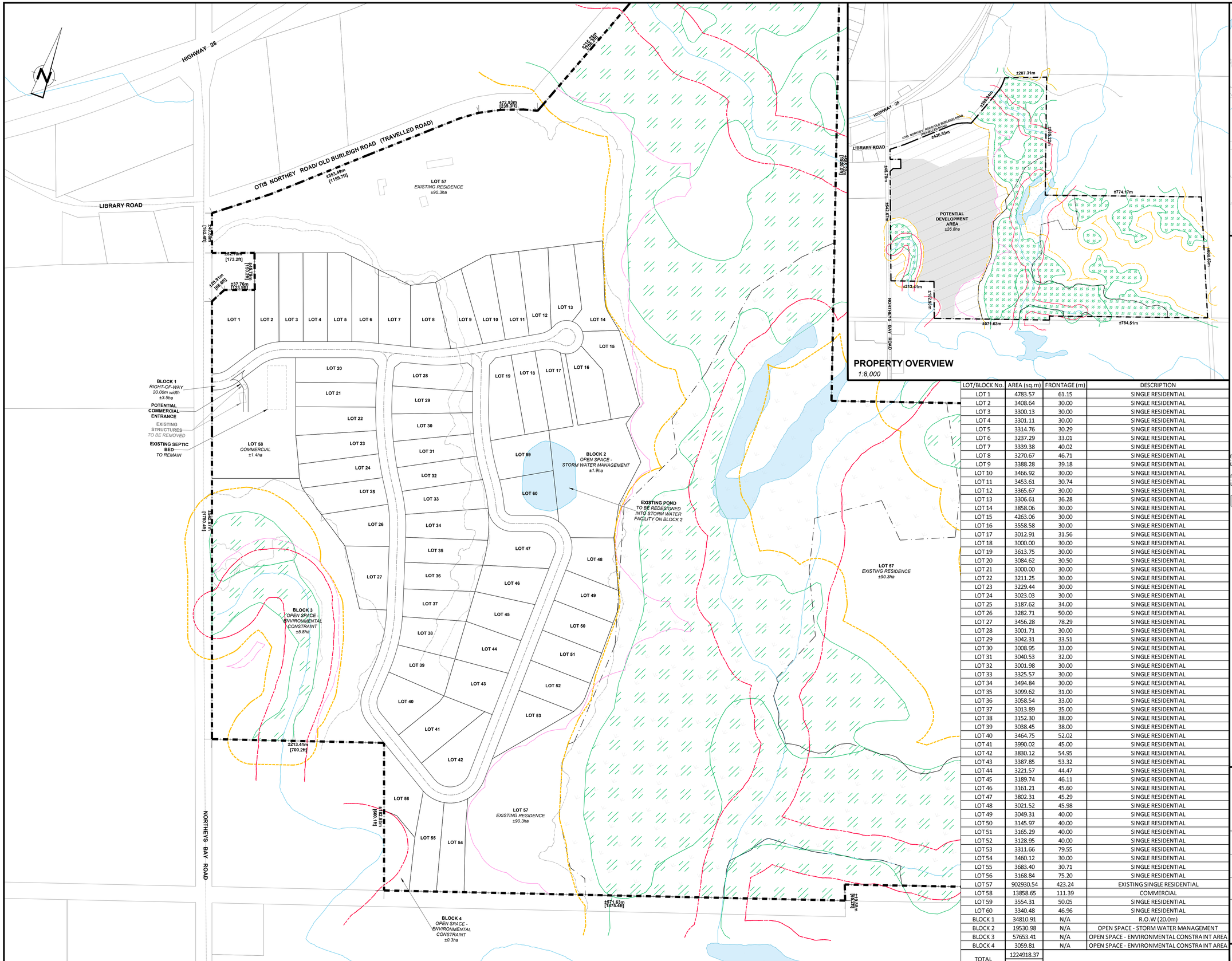


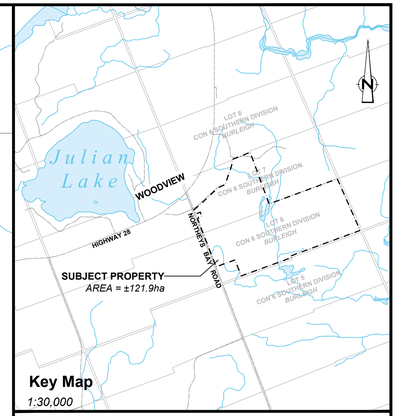
Figure 8: Pumping Test - Test Well 5

Appendix A

Land Information and Conceptual Development Plan



PROPERTY OVERVIEW
1:8,000



Key Map
1:30,000

LOT/BLOCK No.	AREA (sq.m)	FRONTAGE (m)	DESCRIPTION
LOT 1	4783.57	61.15	SINGLE RESIDENTIAL
LOT 2	3408.64	30.00	SINGLE RESIDENTIAL
LOT 3	3300.13	30.00	SINGLE RESIDENTIAL
LOT 4	3301.11	30.00	SINGLE RESIDENTIAL
LOT 5	3314.76	30.29	SINGLE RESIDENTIAL
LOT 6	3237.29	33.01	SINGLE RESIDENTIAL
LOT 7	3339.38	40.02	SINGLE RESIDENTIAL
LOT 8	3270.67	46.71	SINGLE RESIDENTIAL
LOT 9	3388.28	39.18	SINGLE RESIDENTIAL
LOT 10	3466.92	30.00	SINGLE RESIDENTIAL
LOT 11	3453.61	30.74	SINGLE RESIDENTIAL
LOT 12	3365.67	30.00	SINGLE RESIDENTIAL
LOT 13	3306.61	36.28	SINGLE RESIDENTIAL
LOT 14	3858.06	30.00	SINGLE RESIDENTIAL
LOT 15	4263.06	30.00	SINGLE RESIDENTIAL
LOT 16	3558.58	30.00	SINGLE RESIDENTIAL
LOT 17	3012.91	31.56	SINGLE RESIDENTIAL
LOT 18	3000.00	30.00	SINGLE RESIDENTIAL
LOT 19	3613.75	30.00	SINGLE RESIDENTIAL
LOT 20	3084.62	30.50	SINGLE RESIDENTIAL
LOT 21	3000.00	30.00	SINGLE RESIDENTIAL
LOT 22	3211.25	30.00	SINGLE RESIDENTIAL
LOT 23	3229.44	30.00	SINGLE RESIDENTIAL
LOT 24	3023.03	30.00	SINGLE RESIDENTIAL
LOT 25	3187.62	34.00	SINGLE RESIDENTIAL
LOT 26	3282.71	50.00	SINGLE RESIDENTIAL
LOT 27	3456.28	78.29	SINGLE RESIDENTIAL
LOT 28	3001.71	30.00	SINGLE RESIDENTIAL
LOT 29	3042.31	33.51	SINGLE RESIDENTIAL
LOT 30	3008.95	33.00	SINGLE RESIDENTIAL
LOT 31	3040.53	32.00	SINGLE RESIDENTIAL
LOT 32	3001.98	30.00	SINGLE RESIDENTIAL
LOT 33	3325.57	30.00	SINGLE RESIDENTIAL
LOT 34	3494.84	30.00	SINGLE RESIDENTIAL
LOT 35	3099.62	31.00	SINGLE RESIDENTIAL
LOT 36	3058.54	33.00	SINGLE RESIDENTIAL
LOT 37	3013.89	35.00	SINGLE RESIDENTIAL
LOT 38	3152.30	38.00	SINGLE RESIDENTIAL
LOT 39	3038.45	38.00	SINGLE RESIDENTIAL
LOT 40	3464.75	52.02	SINGLE RESIDENTIAL
LOT 41	3990.02	45.00	SINGLE RESIDENTIAL
LOT 42	3830.12	54.95	SINGLE RESIDENTIAL
LOT 43	3387.85	53.32	SINGLE RESIDENTIAL
LOT 44	3221.57	44.47	SINGLE RESIDENTIAL
LOT 45	3189.74	46.11	SINGLE RESIDENTIAL
LOT 46	3161.21	45.60	SINGLE RESIDENTIAL
LOT 47	3802.31	45.29	SINGLE RESIDENTIAL
LOT 48	3021.52	45.98	SINGLE RESIDENTIAL
LOT 49	3049.31	40.00	SINGLE RESIDENTIAL
LOT 50	3145.97	40.00	SINGLE RESIDENTIAL
LOT 51	3165.29	40.00	SINGLE RESIDENTIAL
LOT 52	3128.95	40.00	SINGLE RESIDENTIAL
LOT 53	3311.66	79.55	SINGLE RESIDENTIAL
LOT 54	3460.12	30.00	SINGLE RESIDENTIAL
LOT 55	3683.40	30.71	SINGLE RESIDENTIAL
LOT 56	3168.84	75.20	SINGLE RESIDENTIAL
LOT 57	902930.54	423.24	EXISTING SINGLE RESIDENTIAL
LOT 58	13858.65	111.39	COMMERCIAL
LOT 59	3554.31	50.05	SINGLE RESIDENTIAL
LOT 60	3340.48	46.96	SINGLE RESIDENTIAL
BLOCK 1	34810.91	N/A	R.O.W (20.0m)
BLOCK 2	19530.98	N/A	OPEN SPACE - STORM WATER MANAGEMENT
BLOCK 3	57653.41	N/A	OPEN SPACE - ENVIRONMENTAL CONSTRAINT AREA
BLOCK 4	3059.81	N/A	OPEN SPACE - ENVIRONMENTAL CONSTRAINT AREA
TOTAL	1224918.37		
	121.9ha		

LEGEND

- EXISTING SUBJECT PROPERTY
- EXISTING PARCEL FABRIC
- EXISTING UNEVALUATED WETLAND *(RETRIEVED FROM LIO)*
- EXISTING DRIVEWAY
- EXISTING STRUCTURE
- EXISTING WATERCOURSE
- EXISTING WETLAND BUFFER (30m)
- WETLAND SETBACK (30m) *(PROVIDED BY PALMER ENVIRONMENTAL CONSULTING - EIS)*
- EXISTING WATERBODY (30m) AND WATERCOURSE (30m) BUFFER
- TOP OF BANK (APPROX.)
- BOTTOM OF BANK (APPROX.)
- EXISTING HAMLET DESIGNATION
- EXISTING ENVIRONMENTAL CONSTRAINT DESIGNATION
- POTENTIAL DEVELOPMENT AREA

NOTES:

1. Property boundaries are approximate
2. Potential development area: ±26.8ha

EcoVue Consulting Services Inc.
311 George St. N., Suite 200
Peterborough ON K9J 3H3
Tel: 705-876-8340 Fax: 705-742-8343
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DRAWN BY: MC/TB	PROJECT No.: 21-2207
APPROVED BY:	HORIZ. SCALE: 1:2000
REVISION DATE: MAY 02, 2023	PLOT DATE: MAY 02, 2023

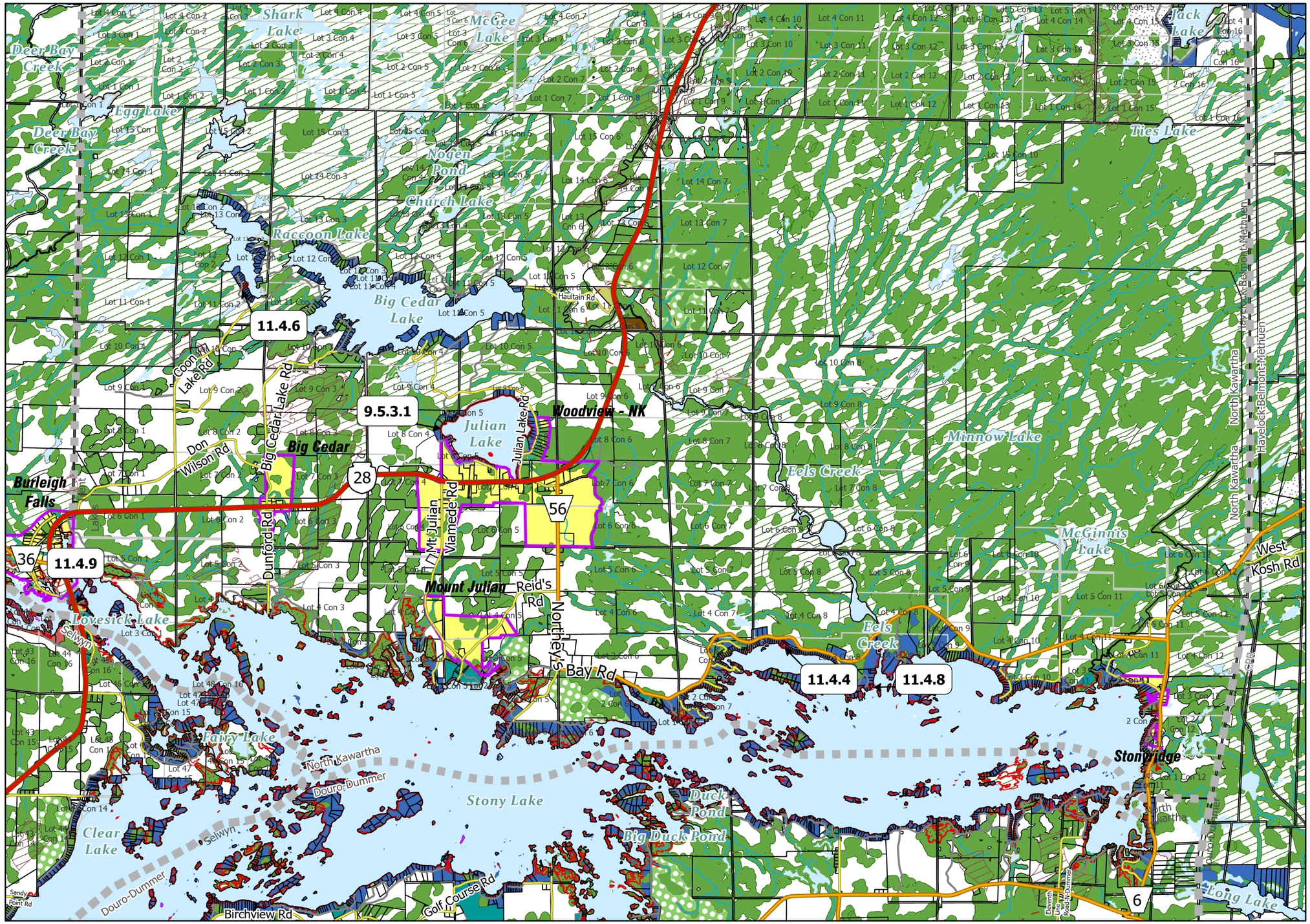
WOODVIEW GOLF SUBDIVISION
ERIC CHALLENGER
65 NORTHEY'S BAY ROAD
PART OF LOTS 6 AND 7, CON 6 SOUTHERN DIVISION
GEOG. TWP. OF BURLEIGH
TOWNSHIP OF NORTH KAWARTHA
COUNTY OF PETERBOROUGH

CONCEPT DRAFT PLAN

CP1

Map NK-1

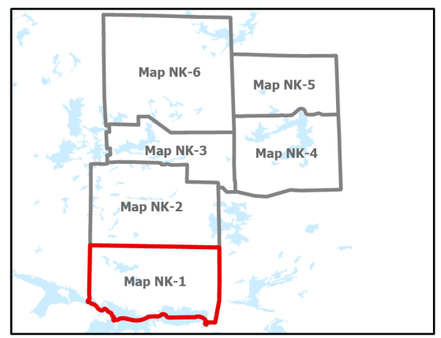
Township of North Kawartha
Land Use Schedule



Land Use Designation
- Commercial
- Crown Lands & Provincial Parks
- Extractive Industrial
- Natural Core Area
- Parks & Conservation
- Recreation Commercial
- Rural
- Rural Settlement
- Trailer Park
- Waste Management Area
- Waterfront Residential
- Aggregate Resource Overlay

Overlays
- Waste Management Assessment Area
- Special Sections
- First Nations
- Settlement Areas
- Floodplain
- Aggregate Resource Overlay

Base Features
- Railroad Track
- Road
- Road Jurisdiction
- County Roads
- Provincial Highways
- Private Roads
- Township Roads
- Watercourse
- Municipal Boundaries
- Parcel
- Lots and Concessions
- Waterbody
- Aggregate Resource Overlay



Date Printed: 2022-05-10 11:49 AM

Scale: 1:54,000

0 1 2 4 Kilometers

N

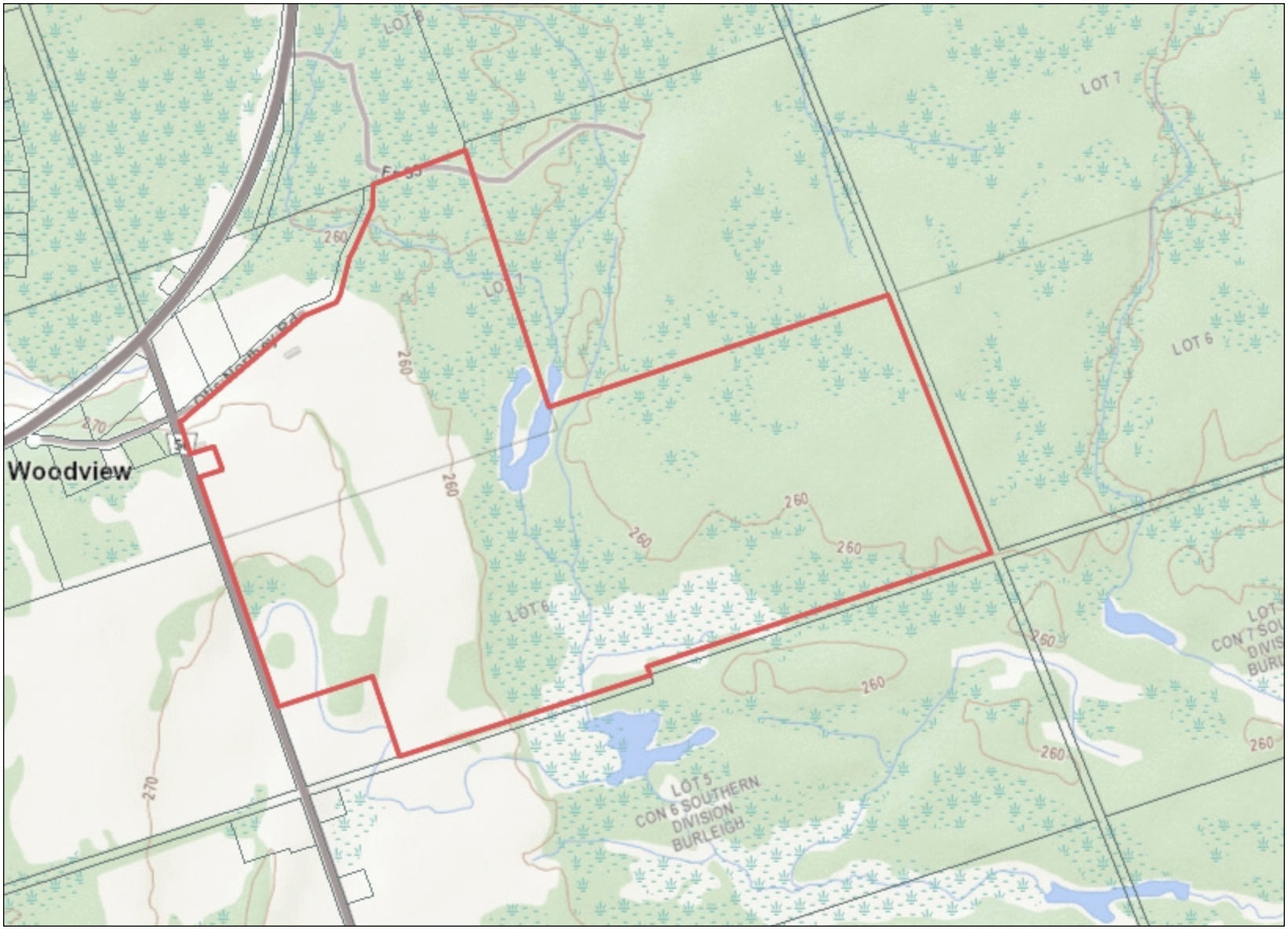
Ontario

MINISTRY OF NATURAL RESOURCES AND FORESTRY

Make a Topographic Map

Topographic Map

Notes:



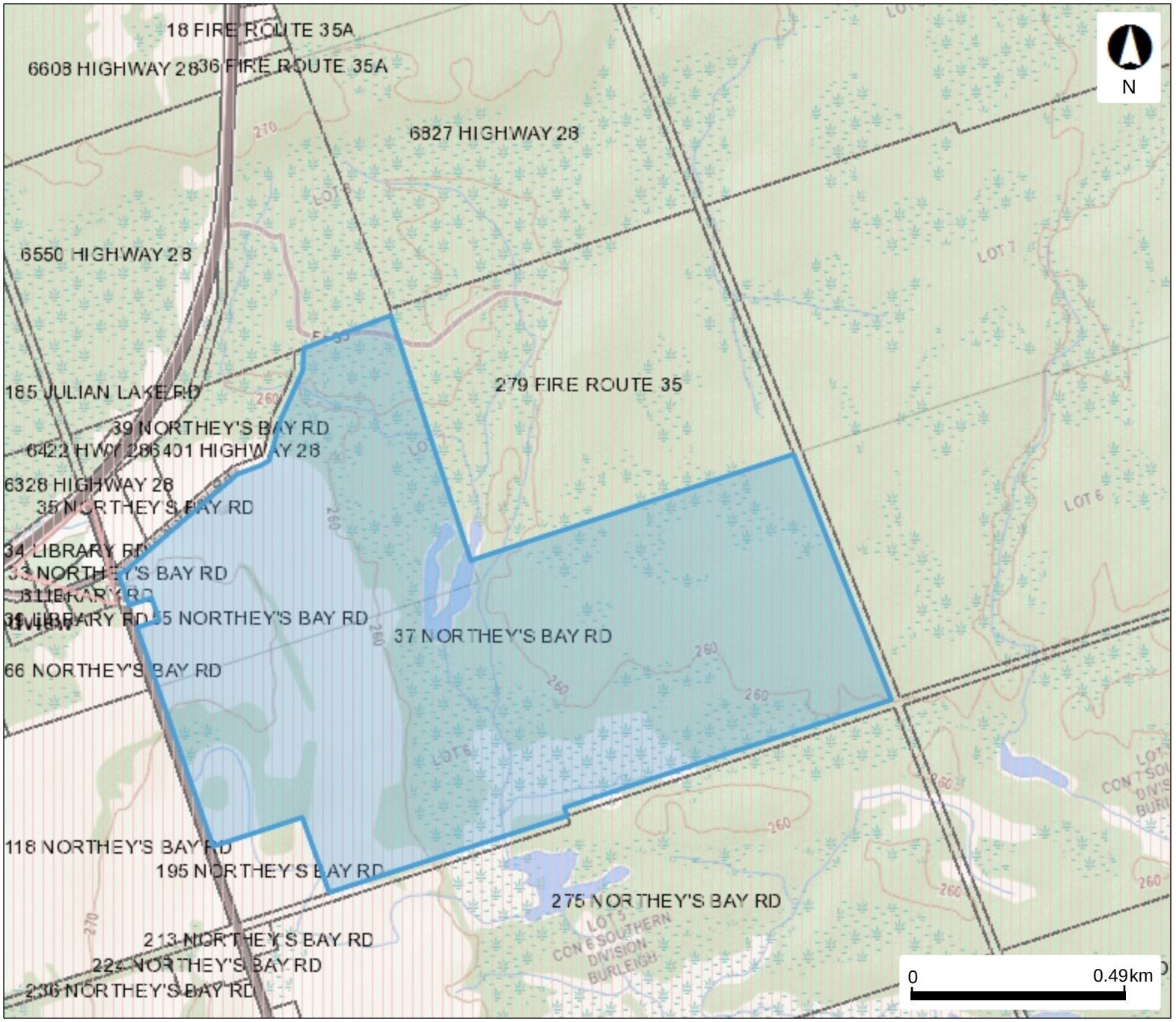
Legend

- Building as Symbol
- Building to Scale
- Airport
- Heliport \ Hospital Heliport
- Seaplane Base
- Ferry Route
- Trail Head \ Trail
- Railway \ Train Station
- Railway with Bridge
- Railway with Tunnel
- Road (Major → Minor)
- Winter Road
- Road with Bridge
- Road with Tunnel
- Primary, Kings or 400 Series Highway
- Secondary Highway
- Tertiary Highway
- District, County, Regional or Municipal Road
- Toll Highway
- One Way Road
- Road with Permanent Blocked Passage
- Road with Address Ranges
- Hydro Line, Communication Line or Unknown Transmission Line
- Natural Gas Pipeline, Water Pipeline or Unknown Pipeline
- Spot Height
- Index Contour
- Contour
- Wooded Area
- Wetland
- Waterbody
- Waterbody Elevation
- Watercourse
- Falls
- Rapids
- Rapids \ Falls
- Rapids
- Rocks
- Lock Gate
- Dam \ Hydro Wall
- Dam \ Hydro Wall
- Provincial \ State Boundary
- International Boundary
- Upper Tier \ District Municipal Boundary
- Lower Tier \ Single Tier Municipal Boundary
- Lot Line
- Indian Reserve
- Provincial Park
- National Park
- Conservation Reserve
- Military Lands

0 0.7 km

Projection: Web Mercator

SPIA-HVA Map



Legend

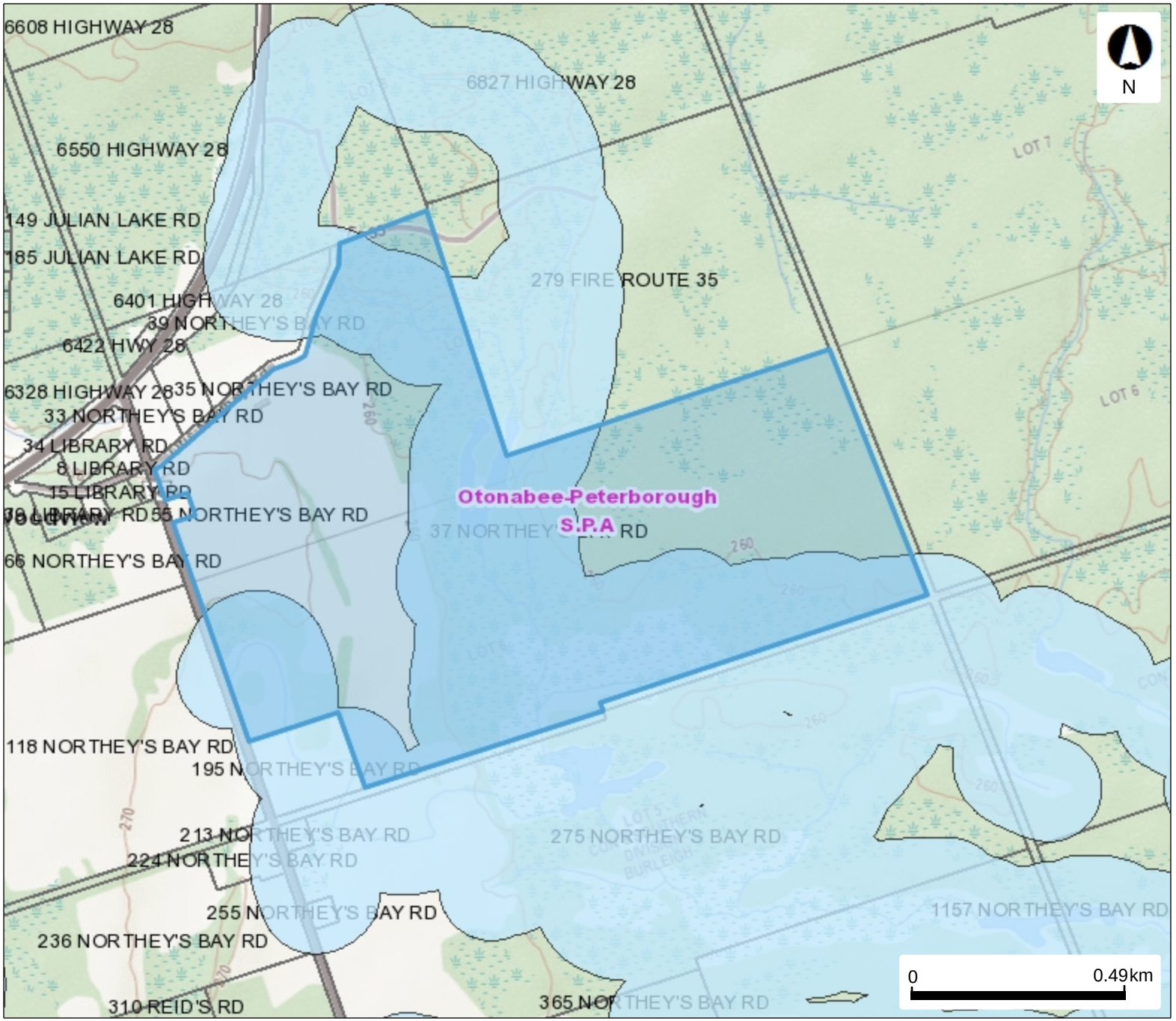
- Source Protection Areas
- Highly Vulnerable Aquifers
- Assessment Parcel with Addre

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Environment, Conservation and Parks (MECP) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

Ontario

Map Created: 1/4/2023
Map Center: 44.59368 N, -78.11907 W

SPIA-IPZ Map



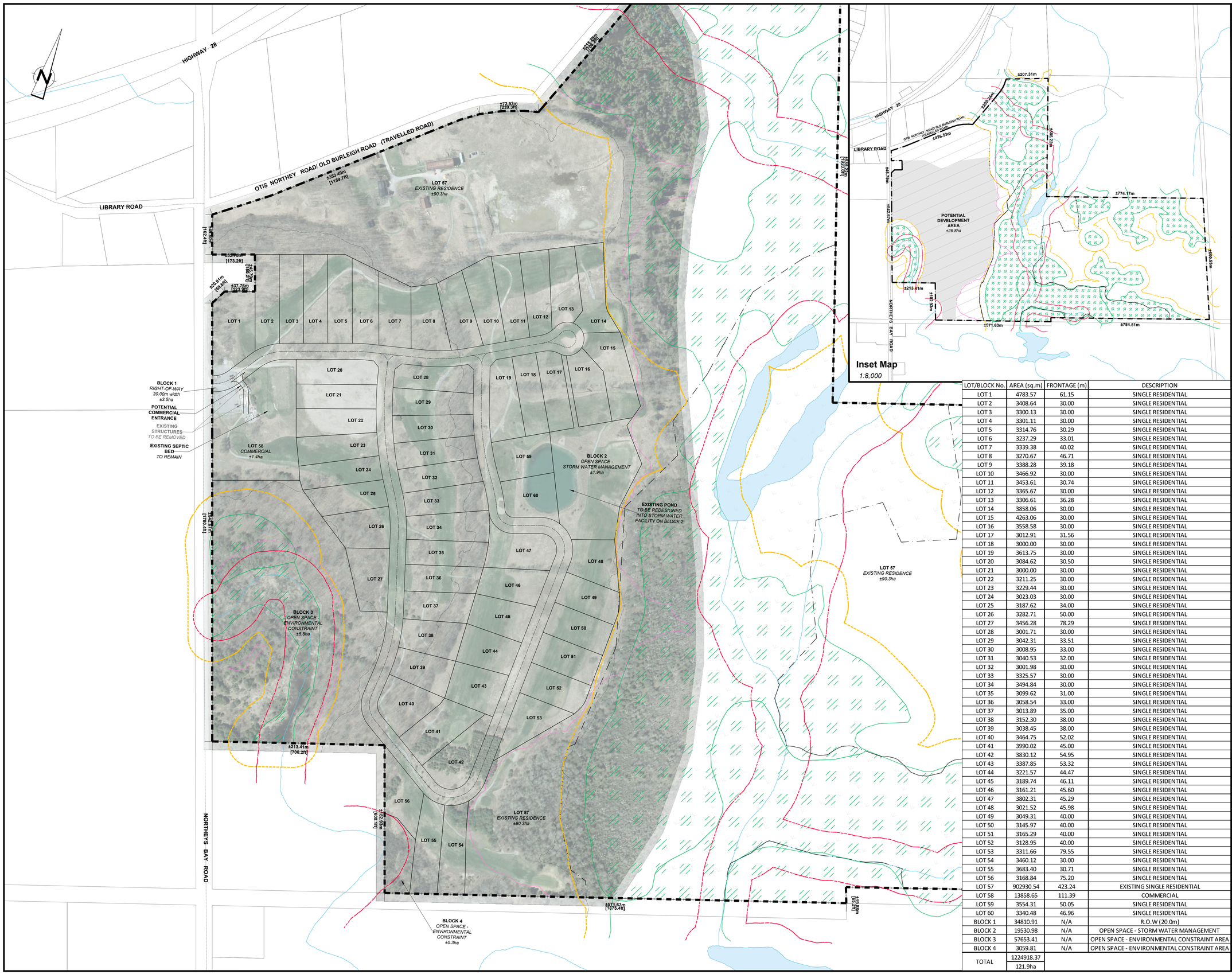
Legend

- Source Protection Areas
- Intake Protection Zone 1
- Intake Protection Zone 2
- Intake Protection Zone 3
- Assessment Parcel with Addre

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Environment, Conservation and Parks (MECP) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

Ontario

Map Created: 1/4/2023
Map Center: 44.59154 N, -78.1201 W



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LOT 31	3040.53	32.00	SINGLE RESIDENTIAL
LOT 32	3001.98	30.00	SINGLE RESIDENTIAL
LOT 33	3325.57	30.00	SINGLE RESIDENTIAL
LOT 34	3494.84	30.00	SINGLE RESIDENTIAL
LOT 35	3099.62	31.00	SINGLE RESIDENTIAL
LOT 36	3058.54	33.00	SINGLE RESIDENTIAL
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- EXISTING STRUCTURE
- EXISTING WATERCOURSE
- EXISTING WETLAND BUFFER (30m)
- WETLAND SETBACK (30m) *(PROVIDED BY PALMER ENVIRONMENTAL CONSULTING - EIS)*
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- BOTTOM OF BANK (APPROX.)
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DRAWN BY: MC/TB	PROJECT No.: 21-2207
APPROVED BY:	HORIZ. SCALE: 1:2000
REVISION DATE: MAY 02, 2023	PLOT DATE: MAY 02, 2023

WOODVIEW GOLF SUBDIVISION
ERIC CHALLENGER
85 NORTHEY'S BAY ROAD
PART OF LOTS 6 AND 7, CON 6 SOUTHERN DIVISION
GEOG. TWP. OF BURLEIGH
TOWNSHIP OF NORTH KAWARTHA
COUNTY OF PETERBOROUGH

CONCEPT DRAFT PLAN - AERIAL

CP2

Appendix B

Test Pit Logs

TABLE 1: TEST PIT LOGS
65 Northeys Bay Road, Township of North Kawartha - Test Pit Investigation
Technician: James Goodwin
Cambium Reference No. 15101-001
Completed: November 4, 2022

Test Pit ID	Depth (mbgs[1])	Soil Sample	Material Description	Depth (m)	DPT[2] (Blows/150 mm)
TP101-22 17T 728027.6 m E, 4941799.3 m N 102.69 m rel	0.0 - 0.30 0.30 - 0.40	GS1 GS2	TOPSOIL: Dark brown silt, some sand, frequent organics, moist Grey weathered/fractured bedrock, interbedded with silt, dry to moist **Test pit terminated at 0.40 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45	2 4 50/100
TP102-22 17T 727971.8 m E, 4941769.0 m N 104.36 m rel	0.0 - 0.30 0.30 - 0.40 0.40 - 0.43	GS1 GS2	TOPSOIL: Dark brown silt, some sand, frequent organics, moist CLAYEY SILT: Dark brown, clayey silt, trace sand, firm to stiff, DTPL (Grain size analysis (GSA): 0% Gravel, 5% Sand, 69% Silt, 26% Clay) Grey weathered/fractured bedrock, interbedded with silt, dry to moist **Test pit terminated at 0.43 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45	6 6 50/50
TP103-22 17T 727899.9 m E, 4941716.4 m N 107.69 m rel	0.0 - 0.25 0.25 - 0.50	GS1 GS2	TOPSOIL: Dark brown silt, some sand, frequent organics, moist SANDY SILT: Light brown, sandy silt, some gravel, some clay compact, dry to moist (GSA: 11% Gravel, 26% Sand, 52% Silt, 11% Clay) **Test pit terminated at 0.50 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45	6 10 50/75
TP104-22 17T 727781.4 m E, 4941659.7 m N 111.70 m rel	0.0		**Bedrock was encountered at ground surface** -Fissures of up to 0.15 m in width were encountered in the bedrock, resembling karst		N/A
TP105-22 17T 727717.8 m E, 4941638.0 m N 112.14 m rel	0.0		**Bedrock was encountered at ground surface** -Fissures of up to 0.15 m in width were encountered in the bedrock, resembling karst		N/A
TP106-22 17T 727665.7 m E, 4941562.2 m N 112.71 m rel	0.0		**Bedrock was encountered at ground surface** -Fissures of up to 0.15 m in width were encountered in the bedrock, resembling karst		N/A
TP107-22 17T 727752.3 m E, 4941538.4 m N 111.70 m rel	0.0		**Bedrock was encountered at ground surface** -Fissures of up to 0.15 m in width were encountered in the bedrock, resembling karst		N/A
TP108-22 17T 727780.8 m E, 4941462.0 m N 110.73 m rel	0.0 - 0.45	GS1	SILTY SAND: Brown, silty sand, compact to dense, dry to moist -organics encountered to 0.10 mbgs **Test pit terminated at 0.45 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60	3 14 29 50/25
TP109-22 17T 727845.4 m E, 4941581.2 m N 111.60 m rel	0.0 - 0.10	GS1	TOPSOIL: Dark brown silt, some sand, frequent organics, moist **Test pit terminated at 0.10 mbgs on bedrock** Test pit open and dry upon completion		N/A
TP110-22 17T 727894.1 m E, 4941502.8 m N 111.16 m rel	0.0 - 0.10	GS1	TOPSOIL: Dark brown silt, some sand, frequent organics, moist **Test pit terminated at 0.10 mbgs on bedrock** Test pit open and dry upon completion		N/A
TP111-22 17T 727947.3 m E, 4941440.6 m N 110.15 m rel	0.0 - 0.10	GS1	TOPSOIL: Dark brown, clayey silt, trace sand, frequent organics, APL **Test pit terminated at 0.10 mbgs on bedrock** Test pit open and dry upon completion		N/A

1. mbgs = metres below ground surface
2. Dynamic probe penetration test, consisting of driving a 19 mm diameter steel rod 150 mm into the soil with an 8 kg hammer falling 750 mm.

TABLE 1: TEST PIT LOGS
65 Northeys Bay Road, Township of North Kawartha - Test Pit Investigation
Technician: James Goodwin
Cambium Reference No. 15101-001
Completed: November 4, 2022

Test Pit ID	Depth (mbgs[1])	Soil Sample	Material Description	Depth (m)	DPT[2] (Blows/150 mm)
Test Pit ID	Depth (mbgs[1])	Soil Sample	Material Description	Depth (m)	DPT[2] (Blows/150 mm)
TP112-22 17T 727944.4 m E, 4941369.3 m N 110.24 m rel	0.0		**Bedrock was encountered at ground surface** -Fissures of up to 0.20 m in width and at least 1.5 m deep were encountered in the bedrock, resembling karst		N/A
TP113-22 17T 727981.4 m E, 4941281.1 m N 109.90 m rel	0.0 - 0.20	GS1	TOPSOIL: Brown, clayey silt, some gravel, frequent organics, APL **Test pit terminated at 0.20 mbgs on bedrock** Test pit open and dry upon completion		N/A
TP114-22 17T 727999.6 m E, 4941227.7 m N 109.01 m rel	0.0 - 0.10	GS1	TOPSOIL: Dark brown silt, some sand, frequent organics, moist **Test pit terminated at 0.10 mbgs on bedrock** -Fissures of up to 0.15 m in width and at least 1.5 m deep were encountered in the bedrock, resembling karst Test pit open and dry upon completion		N/A
TP115-22 17T 728024.4 m E, 4941147.9 m N 108.97 m rel	0.0 - 0.10	GS1	TOPSOIL: Dark brown silt, some sand, frequent organics, moist **Test pit terminated at 0.10 mbgs on bedrock** -Fissures of up to 0.15 m in width and at least 1.5 m deep were encountered in the bedrock, resembling karst Test pit open and dry upon completion		N/A
TP116-22 17T 728075.2 m E, 4941094.4 m N 103.21 m rel	0.0 - 1.10	GS1	CLAYEY SILT: Brown, clayey silt, trace sand, firm to very stiff, DTPL -organics encountered from surface to 0.15 mbgs -some cobbles and boulders encountered at 0.75 mbgs **Test pit terminated at 1.10 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60 0.60 - 0.75 0.75 - 0.90 0.90 - 1.05	1 3 6 9 8 9 50/25
TP117-22 17 T 728095.7 m E, 4941052.3 m N 103.90 m rel	0.0 - 0.30 0.30 - 0.75 0.75 - 1.35	GS1 GS2 GS3	TOPSOIL: Brown, clayey silt, trace sand, frequent organics, moist CLAYEY SILT: Brown, clayey silt, trace sand, trace gravel, stiff to very hard, DTPL SILTY SAND: Brown, silty sand, some gravel, trace clay, compact to dense, dry to moist -cobbles and boulders encountered throughout **Test pit terminated at 1.35 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60 0.60 - 0.75 1.20 - 1.35 1.35 - 1.50	3 9 26 23 8 32 50/25
TP118-22 17T 728131.7 m E, 4941104.3 m N 102.97 m rel	0.0 - 0.45 0.45 - 1.20	GS1 GS2	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist SANDY SILT: Dark brown, sandy silt, trace clay, trace organics, compact to dense, moist -some cobbles and boulders encountered at 0.90 mbgs **Test pit terminated at 1.20 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60 0.60 - 0.75 0.75 - 0.90	1 3 7 20 48 50
TP119-22 17 T 728165.1 m E, 4941218.3 m N 102.00 m rel	0.0 - 0.40 0.40 - 1.00 1.00 - 1.10	GS1 GS2 GS3	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist SANDY SILT: Brown, sandy silt, some clay, weathered bedrock/shale throughout Grey weathered/fractured bedrock, interbedded with silt, dry to moist **Test pit terminated at 1.10 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60 0.60 - 0.75	3 6 12 30 50/75
TP120-22 17T 728163.6 m E, 4941299.4 m N 102.70 m rel	0.0 - 0.15	GS1	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist **Test pit terminated at 0.15 mbgs on bedrock** Test pit open and dry upon completion		N/A
TP121-22 17T 4941364.7 m E, 4920940.9 m N 102.18 m rel	0.0 - 0.25	GS1	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist **Test pit terminated at 0.25 mbgs on bedrock** Test pit open and dry upon completion		N/A
TP122-22 17 T 728235.9 m E, 4941270.6 m N 100.27 m rel	0.0 - 0.25 0.25 - 0.40	GS1 GS2	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist SANDY SILT: Brown, sandy silt, trace clay, trace gravel, compact, dry to moist **Test pit terminated at 0.40 mbgs on bedrock** Test pit open and dry upon completion		N/A
TP123-22 17T 728240.3 m E, 4941353.5 m N 100.17 m rel	0.0 - 0.20 0.20-1.30 1.30-2.64	GS1	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist **Test pit terminated at 0.20 mbgs on bedrock** Test pit open and dry upon completion		N/A
TP124-22 17T 728171.7 m E, 4941414.6 m N 103.09 m rel	0.0 - 0.25 0.25 - 1.10	GS1 GS2	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist SILTY GRAVEL: Brown, silty gravel, some clay, trace sand, compact to dense, dry to moist (GSA: 50% Gravel, 7% Sand, 26% Silt, 17% Clay) **Test pit terminated at 1.10 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60 0.60 - 0.75 0.75 - 0.90 0.90 - 1.05	1 5 10 18 24 35 50/100

1. mbgs = metres below ground surface
2. Dynamic probe penetration test, consisting of driving a 19 mm diameter steel rod 150 mm into the soil with an 8 kg hammer falling 750 mm.

TABLE 1: TEST PIT LOGS
65 Northeys Bay Road, Township of North Kawartha - Test Pit Investigation
Technician: James Goodwin
Cambium Reference No. 15101-001
Completed: November 4, 2022

Test Pit ID	Depth (mbgs[1])	Soil Sample	Material Description	Depth (m)	DPT[2] (Blows/150 mm)
TP125-22 17T 728098.3 m E, 4941459.0 m N 104.94 m rel	0.0 - 0.25 0.25 - 0.65	GS1 GS2	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist SILT AND CLAY: Brown, silt and clay, some sand, trace gravel, very stiff to hard, APL (GSA: 1% Gravel, 11% Sand, 46% Silt, 42% Clay) **Test pit terminated at 0.65 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60	1 5 30 50/125
TP126-22 17T 728080.2 m E, 4941211.9 m N 106.76 m rel	0.0 - 0.25 0.25 - 1.10	GS1 GS2	TOPSOIL: Brown, clayey silt, frequent organics, moist SANDY GRAVEL: Brown, sandy gravel, some silt, trace clay, compact to dense, moist to wet (GSA: 54% Gravel, 28% Sand, 10% Silt, 8% Clay) -cobbles and boulders encountered throughout **Test pit terminated at 1.10 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60 0.60 - 0.75 0.75 - 0.90	1 6 10 23 24 35
TP127-22 17T 728072.6 m E, 4941320.4 m N 105.94 m rel	0.0 - 0.25 0.25 - 0.60	GS1 GS2	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist SANDY SILT: Brown, sandy silt, trace clay, compact, moist **Test pit terminated at 0.60 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60	1 5 8 50/125
TP128-22 17T 728041.2 m E, 4941464.4 m N 106.35 m rel	0.0 - 0.95	GS1	SILTY SAND: Brown, silty sand, trace gravel, compact, dry to moist -organics encountered from surface to 0.30 mbgs -cobbles encountered from 0.60 mbgs to 0.85 mbgs **Test pit terminated at 0.95 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60	1 5 10 50/100
TP129-22 17T 728005.8 m E, 4941556.3 m N 104.10 m rel	0.0 - 0.45	GS1	SANDY SILT: Brown, sandy silt, trace clay, trace gravel, compact to dense, moist to wet (GSA: 1% Gravel, 28% Sand, 63% Silt, 8% Clay) -organics encountered from surface to 0.15 mbgs **Test pit terminated at 0.45 mbgs on bedrock** Test pit open with minimal water pooling at the base of the test pit upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45	1 5 50
TP130-22 17T 728059.1 m E, 4941628.0 m N 102.46 m rel	0.0 - 0.20 0.20 - 0.40	GS1 GS2	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist SANDY SILT: Light brown, sandy silt, some gravel, trace clay, compact, moist to wet **Test pit terminated at 0.40 mbgs on bedrock** Test pit open and dry upon completion		N/A
TP131-22 17T 728140.1 m E, 4941678.4 m N 101.97 m rel	0.0 - 0.15 0.20 - 0.40	GS1 GS2	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist SILTY SAND: Brown, silty sand, some clay, compact, moist to wet (GSA: 0% Gravel, 51% Sand, 32% Silt, 17% Clay) **Test pit terminated at 0.40 mbgs on bedrock** Test pit open and dry upon completion		N/A
TP132-22 17 T 728084.3 m E, 4941758.9 m N 105.63 m rel	0.0 0.30 0.30 - 0.75	GS1 GS2	SANDY SILT: Brown, sandy silt, trace clay, trace gravel, loose to compact, moist Grey weathered/fractured bedrock, interbedded with silt, some sand and trace clay, moist to wet **Test pit terminated at 0.75 mbgs on bedrock** Test pit open and dry upon completion	0.0 - 0.15 0.15 - 0.30 0.30 - 0.45 0.45 - 0.60 0.60 - 0.75	1 4 10 37 50/100
TP133-22 17T 728084.3 m E, 4941758.9 m N 102.26 m rel	0.0 - 0.20	GS1	TOPSOIL: Dark brown silt, some sand, trace to some clay, frequent organics, moist **Test pit terminated at 0.20 mbgs on bedrock** Test pit open and dry upon completion		N/A

1. mbgs = metres below ground surface
2. Dynamic probe penetration test, consisting of driving a 19 mm diameter steel rod 150 mm into the soil with an 8 kg hammer falling 750 mm.

Appendix C

Test Well Records

Ontario Ministry of the Environment

We [illegible] nt number below)
A 050569
A050569

Well Record
Regulation 903 Ontario Water Resources Act

page 1 of 1

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Help Desk (Toll Free) at 1-888-396-9355.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

[redacted]

Address of Well Location (County/District/Municipality)	Township	Lot	Concession
PETERBOROUGH	BURLEIGH	6&7	6

RR#/Street Number/Name	City/Town/Village	Site/Compartment/Block/Tract etc.
87 NORTHYS BAY ROAD	WOODVIEW	

GPS Reading	NAD	Zone	Easting	Northing	Unit Make/Model	Mode of Operation:	
	83	17	727735	4991450	ETREX	UTM	☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
GREY	LIMESTONE		FRACTURED	0	12
GREY	LIMESTONE		HARD	12	37
RED	GRANITE		HARD	37	72
GREY	GRANITE		HARD	72	130
BLACK	GRANITE		HARD	130	155
GREY	GRANITE		HARD	155	200
PINK	GRANITE		POROUS	200	205
GREY	GRANITE		HARD	205	290
	* ALL MEASUREMENTS IN IMPERIAL *				

Hole Diameter

Depth From	Depth To (Metres)	Diameter (Centimetres)
0	20	8 3/4
20	290	6 1/8

Water Record

Water found at ___ (Metres)	Kind of Water		
200 ft	☑ Fresh	☐ Sulphur	☐ Gas
☐ Salty	☐ Minerals	☐ Other:	
___ m	☐ Fresh	☐ Sulphur	☐ Gas
☐ Salty	☐ Minerals	☐ Other:	
___ m	☐ Fresh	☐ Sulphur	☐ Gas
☐ Salty	☐ Minerals	☐ Other:	

After test of well yield, water was
☑ Clear and sediment free
☐ Other, specify

Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam (centimetres)	Material	Wall thickness (centimetres)	Depth From	Depth To (Metres)
Casing				
6 5/8	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	188	0	20
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☑ Open hole		20	290

Test of Well Yield

Pumping test method: SUBMERSIBLE

	Draw Down Time min	Draw Down Water Level (Metres)	Recovery Time min	Recovery Water Level (Metres)
Pump intake set at - (metres) 200'	Static Level	27		
Pumping rate - (litres/min) 6 GPM	1	30	1	104
Duration of pumping 1 hrs + ___ min	2	34.1	2	102.3
Final water level end of pumping 101.6 metres	3	36.9	3	101.6
Recommended pump type. ☐ Shallow ☑ Deep	4	38.2	4	100.1
Recommended pump depth. 250 metres	5	40	5	99.8
Recommended pump rate. 6 GPM (litres/min)	10	45.1	10	82.2
	15	60.4	15	69.6
If flowing give rate - (litres/min)	20	56.4	20	55.8
	25	63.6	25	44.2
If pumping discontinued, give reason.	30	69.7	30	36.2
	40	83.9	40	31.6
	50	96	50	29.1
	60	106.9	60	27

Plugging and Sealing Record

☑ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	20	NEAT CEMENT & BENTONITE SLURRY	14 FT3

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☑ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☑ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

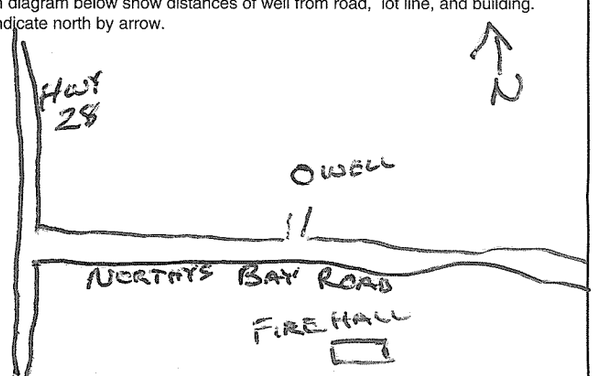
☑ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor	Well Contractor's Licence No.
WENSLEY WATER WELL LTD	6578
Business Address (street name, number, city etc.)	
RR 2 LAKEFIELD	
Name of Well Technician (last name, first name)	**Well Technician's Licence No.**
ERIC WENSLEY	632
Signature of Technician/Contractor	**Date Submitted** YYYY MM DD
X	2007 05 25

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Audit No.	Date Well Completed YYYY MM DD
Z 73155	2007 05 14
Was the well owner's information package delivered? ☐ Yes ☑ No	**Date Delivered** YYYY MM DD

Ministry Use Only

Data Source	Contractor
	6578
Date Received YYYY MM DD	**Date of Inspection** YYYY MM DD
JUN 29 2007	
Remarks	**Well Record Number**

Ontario Ministry of the Environment

Well number below): A 050575

A 050575

Well Record

Regulation 903 Ontario Water Resources Act

page 1 of 1

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- Please print clearly in blue or black ink only.

Ministry Use Only

[redacted]

Address of Well Location (County/District/Municipality)	Township	Lot	Concession
PETERBOROUGH	BURLEIGH	6-7	6

RR#/Street Number/Name	City/Town/Village	Site/Compartment/Block/Tract etc.
37 NORTHYS BAY ROAD	WOODVIEW	

GPS Reading	NAD	Zone	Easting	Northing	Unit Make/Model	Mode of Operation:	
	83	17	728097	4941520	EREX	UTM	☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
GREY	LIMESTONE	CLAY	FRACTURED	0	12
GREY	LIMESTONE		HARD	12	24
RED	GRANITE		HARD	24	40
WHITE	GRANITE		HARD	40	58
WHITE	GRANITE		FRACTURED	58	65
	ALL MEASUREMENTS IN IMPERIAL				

Hole Diameter

Depth From	Depth To (Metres)	Diameter (Centimetres)
0	20	8 3/4
20	65	6 1/8

Water Record

Water found at (Metres)	Kind of Water		
58'	☑ Fresh	☐ Sulphur	☐ Gas
	☐ Salty	☐ Minerals	☐ Other:
___ m	☐ Fresh	☐ Sulphur	☐ Gas
	☐ Salty	☐ Minerals	☐ Other:
___ m	☐ Fresh	☐ Sulphur	☐ Gas
	☐ Salty	☐ Minerals	☐ Other:

After test of well yield, water was
☑ Clear and sediment free
☐ Other, specify

Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam (centimetres)	Material	Wall thickness (centimetres)	Depth From	Depth To (Metres)
Casing				
6 5/8	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	188	0	20
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☑ Open hole		20	65

Test of Well Yield

Pumping test method: SUBMERSIBLE

Pump intake set at - (metres) 60

Pumping rate - (litres/min) 18GPM

Duration of pumping ___ hrs + ___ min

Final water level end of pumping 51.5 metres

Recommended pump type. ☐ Shallow ☑ Deep

Recommended pump depth. 60 metres

Recommended pump rate. 16GPM (litres/min)

If flowing give rate - (litres/min)

If pumping discontinued, give reason.

	Draw Down Time min	Draw Down Water Level (Metres)	Recovery Time min	Recovery Water Level (Metres)
Static Level		31.1		
1	33		1	47.7
2	35.1		2	44.9
3	37.2		3	44.3
4	38.9		4	43.4
5	39		5	42.6
10	42.7		10	39.2
15	45.3		15	36.9
20	46.8		20	34.9
25	47.8		25	32.8
30	49.9		30	31.1
40	50.8		40	31.1
50	50.		50	31.1
60	51.5		60	31.1

Plugging and Sealing Record

☑ Annular space ☐ Abandonment

Depth set at - (Metres) From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	20	BENTONITE SLURRY	7 FT 3

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☑ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☑ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☑ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor	Well Contractor's Licence No.
WEAVERLEY WATER WELL	6578

Business Address (street name, number, city etc.): RR 2 LAKEFIELD

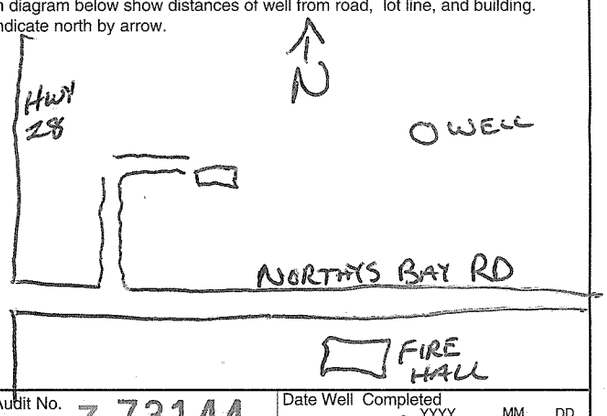
Name of Well Technician (last name, first name)	Well Technician's Licence No.
ERIC WEAVERLEY	632

Signature of Technician/Contractor: X [signature]

Date Submitted YYYY MM DD: 2007 09 08

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Audit No.	Date Well Completed YYYY MM DD
Z 73144	07 08 23
Was the well owner's information package delivered? ☐ Yes ☑ No	Date Delivered YYYY MM DD

Ministry Use Only

Data Source	Contractor
	6578
Date Received YYYY MM DD: AUG 09 2007	Date of Inspection YYYY MM DD
Remarks	Well Record Number

0506E (08/2006) Ministry's Copy

Cette formule est disponible en français

Ontario Ministry of the Environment

Well Tag No. *(Place Sticker and/or Print Below)* A 062850

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

[redacted]

Address of Well Location (Street Number/Name, RR)	Township	Lot	Concession
37 NORTHYS BAY ROAD	BURLEIGH	6-7	6

County/District/Municipality	City/Town/Village	Province	Postal Code
PETERBOROUGH	WOOD VIEW	Ontario	K0L2H0

UTM Coordinates NAD 8 3	Zone	Easting	Northing	GPS Unit Make	Model	Mode of Operation
	[redacted]	737975	4941569	GARMIN	ETREX	☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Overburden and Bedrock Materials *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	To
GREY	LIMESTONE	CLAY	FRACTURED	0	20
RED	GRANITE		HARD	20	43
BLACK	GRANITE		HARD	43	92
RED	GRANITE		HARD	92	102
	# ALL MEASURAMENTS IN IMPERIAL *				

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
0	20	BENTONITE SLURRY	7 FT³

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Rotary (Air) ☐ Digging
☑ Air percussion ☐ Boring
☐ Other, *specify* _____

Water Use

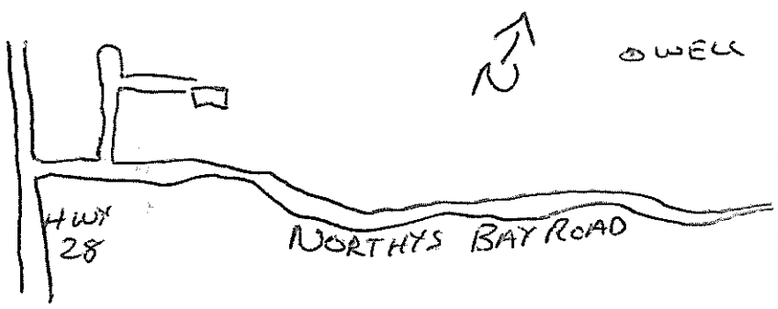
☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☑ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Status of Well

☑ Water Supply ☐ Dewatering Well ☐ Observation and/or Monitoring Hole
☐ Replacement Well ☐ Abandoned, Insufficient Supply ☐ Alteration (Construction)
☐ Test Hole ☐ Abandoned, Poor Water Quality ☐ Other, *specify* _____
☐ Recharge Well ☐ Abandoned; other, *specify* _____

Location of Well

Please provide a map below showing:
- all property boundaries, and measurements sufficient to locate the well in relation to fixed points,
- an arrow indicating the North direction
- detailed drawings can be provided as attachments no larger than legal size (8.5" by 14")
- vidigital pictures of inside of well can also be provided



Date Well Completed (yyyy/mm/dd)	Was the well owner's information package delivered?	Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd)
2007/12/03	☐ Yes ☑ No	2007/12/20

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
WENSLEY WATER WELL LTD	6578

Business Address (Street No./Name, number, RR)	Municipality
RR 2 LAKEFIELD	PETERBOROUGH

Province	Postal Code	Business E-mail Address
ONT	K0L2H0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
705 652 1629	ERIC WENSLEY

Well Technician's Licence No.	Signature of Technician	Date Submitted (yyyy/mm/dd)
0632	[signature]	2007/12/20

Results of Well Yield Testing

Check box if after test of well yield, water was:
☑ Clear and sand free
☐ Cannot develop to sand-free state

If pumping discontinued, give reason:

Pumping test method: SUBMERSIBLE

Pump intake set at (Metres): 100'

Pumping rate (Litres/min): 0.5 GPM

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (Metres): 99.6

Recommended pump type: ☐ Shallow ☑ Deep

Recommended pump depth: 100 Metres

Recommended pump rate (Litres/min): 0.5 GPM

If flowing give rate (Litres/min):

Draw Down Time (Min)	Water Level (Metres)	Recovery Time (Min)	Water Level (Metres)
Static Level	14.6	Static Level	
1	19.1	1	99.3
2	26.5	2	99
3	29	3	98.4
4	30	4	97.9
5	41.3	5	97.1
10	52.7	10	94.3
15	61	15	91.8
20	70.9	20	87
25	81.6	25	84.3
30	86.7	30	81.9
40	90.1	40	76.1
50	95.1	50	71.3
60	99.6	60	68.7

Water Details

Water found at Depth	Kind of Water
100' Metres ☐ Gas	☑ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Casing Used

☐ Galvanized ☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete

Screen Used

☐ Galvanized ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete

No Casing and Screen Used

☑ Open Hole

Disinfected? ☑ Yes ☐ No

Casing and Well Details

Diameter of the Hole (Centimetres): 6 1/8
Depth of the Hole (Metres): 102'
Wall Thickness (Metres): .188
Inside Diameter of the Casing (Metres): 6 5/8
Depth of the Casing (Metres): 20'

Ministry Use Only

Audit No.: Z 69758
Well Contractor No.:
Date Received (yyyy/mm/dd): JAN 28 2008
Date of Inspection (yyyy/mm/dd):
Remarks:

Ontario — Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☐ Imperial

Well Tag No. (Place Sticker and/or Print Below) **Tag#:A328193**

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
ERIC	CHALLENGER	EBCHALLEN@GMAIL	

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
37 Northeys Bay Rd	North Kawartha	ON	K0L3E0	2893149947

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
65 Northeys Bay Rd	North Kawartha		

County/District/Municipality	City/Town/Village	Province	Postal Code
Peterborough County	Lakefield	Ontario	K0L2H0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	728124	4941115		

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
Brown	Sandy loam	stones	Dry	0	3'
Grey	Limestone		Hard / Fractures	3'	19'
Red/green	Granite		Soft / Fractures	19	35
Pink/Red	Granite		Hard / Soft Seams	35	60
Pink/white	Granite		Hard	60	100

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	20'	3/8 Bentonite chip	3 Bags
		Quick Grout	140 L

Method of Construction

☐ Cable Tool ☐ Diamond
☑ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☑ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☑ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☑ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ 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) From	Depth (m/ft) To
6¼"	steel	.188	+2'	20'

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☐ Water Supply
☐ Replacement Well
☑ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

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): 100'

Pumping rate (l/min / GPM): 10 gal/min

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 19'8"

If flowing give rate (l/min/GPM)

Recommended pump depth (m/ft): 90'

Recommended pump rate (l/min/GPM): 8 gal/min

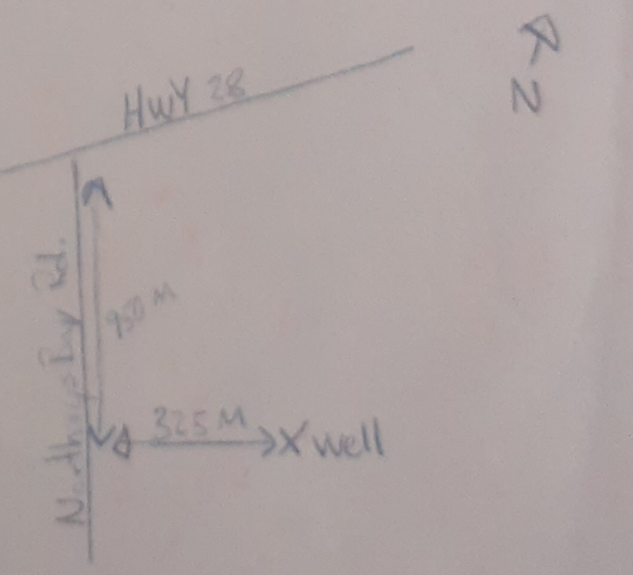
Well production (l/min/GPM): 10+ gal/min

Disinfected? ☑ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	14'		
1	15'	1	18
2	16'	2	16'10"
3	16'4"	3	14
4	16'9"	4	
5	17'2	5	
10	17'7"	10	
15	18'	15	
20	18'6"	20	
25	18'9	25	
30	18'11"	30	
40	19'	40	
50	19'4	50	
60	19'8	60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments: 90M South on Northeys Bay rd
325M East to well

Water Details

Water found at Depth	Kind of Water	Other, specify
25' (m/ft) ☐ Gas	☑ Fresh ☐ Untested	
60' (m/ft) ☐ Gas	☑ Fresh ☐ Untested	
(m/ft) ☐ Gas	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	20'	10"
20	100'	6"

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Bruce Welsh Drilling	14515

Business Address (Street Number/Name)	Municipality
461 Emily Park Rd	Omemee

Province	Postal Code	Business E-mail Address
Ontario	K0L2W0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
	Burgess, Ryan

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
41212	Ryan Burgess	2020/11/20

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☑ Yes ☐ No	2020/11/20	2020/11/20

Ministry Use Only

Audit No. Z390218

Received

Well Owner's Copy

Ontario — Ministry of the Environment

Well Tag Number: A 013147
A 013147

Well Record
Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only
MUN | CON | LOT

Well Owner's Information and Location of Well Information

[redacted]

PETERBOROUGH | SOUTH BURLEIGH | 7 | 6

RR#/Street Number/Name: #37 NORTHEYS BAY ROAD
City/Town/Village: WOODVIEW
Site/Compartment/Block/Tract etc.:

GPS Reading: NAD 83 | Zone 17 | Easting 727680 | Northing 4941793
Unit Make/Model: GARMIN
Mode of Operation: ☑ Undifferentiated ☐ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To
GREY	LIMESTONE	BOULDERS.	FILL	0	.5
GREY	LIMESTONE	RED SHALE	BEDROCK	.5	7
GREY	GRANITE		BEDROCK	7	73
BLACK	GRANITE			73	80
GREY	GRANITE		BEDROCK	80	91

TOTAL WELL CAPACITY 12 GPM
RECOMENDED PUMP SETTING 120 FEET

Hole Diameter

Depth From	Metres To	Diameter Centimetres
0	7.9	23.
7.9	91	15

Water Record

Water found at Metres: 91 m
Kind of Water: ☑ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
After test of well yield, water was ☑ Clear and sediment free ☐ Other, specify
Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Metres To
Casing				
16	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.477	0	7.9
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☑ Open hole		7.9	91

Test of Well Yield

Pumping test method: Pump
Pump intake set at - (metres): 12
Pumping rate - (litres/min): 40
Duration of pumping: 1 hrs + 0 min
Final water level end of pumping: 12. metres
Recommended pump type: ☐ Shallow ☑ Deep
Recommended pump depth: 35 metres
Recommended pump rate: 40 (litres/min)
If flowing give rate - (litres/min):
If pumping discontinued, give reason.

	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Static Level	0	67.63		12.0
1	8.41	1	10.17	
2	9.12	2	9.21	
3	9.73	3	8.63	
4	10.47	4	8.11	
5	11.01	5	8.01	
10	12.0	10	7.92	
15	12.0	15	7.84	
20	12.0	20	7.77	
25	12.0	25	7.71	
30	12.0	30	7.67	
40	12.0	40	7.65	
50	12.0	50	7.64	
60	12.0	60	7.64	

Plugging and Sealing Record ☑ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	7.9	NEAT CEMENT	.31.

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

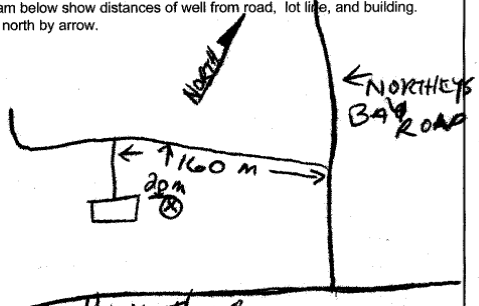
☐ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor: JOE LEGGE & SONS DRILLING
Well Contractor's Licence No.: 7052.
Business Address (street name, number, city etc.): RR#3 BANCROFT. KOC 1C0
Name of Well Technician (last name, first name): LEGGE JOE
Well Technician's Licence No.: T-1879
Signature of Technician/Contractor: X Joe Legge
Date Submitted: YYYY MM DD

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Audit No.: Z 13167
Date Well Completed: YYYY 2004 MM 12 DD 13
Was the well owner's information package delivered? ☐ Yes ☑ No
Date Delivered: YYYY MM DD

Ministry Use Only

Data Source | Contractor: 7052
Date Received: JAN 18 2005 | Date of Inspection: YYYY MM DD
Remarks | Well Record Number

0506E (09/03)

Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☐

Cette formule est disponible en français

POND

Well 3

Ontario Ministry of the Environment

Well Tag No. *(Place Sticker and/or Print Below)* A 062849

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name	E-mail Address	☐ Well Constructed by Well Owner
ERIC	WALLENGER		

Mailing Address (Street Number/Name, RR)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
63 JAMESON DRIVE	PETERBOROUGH	ONT	K9H 7M9	705-749-1108

Part A' Construction and/or Major Alteration of a Well

Address of Well Location (Street Number/Name, RR)	Township	Lot	Concession
37 NORTH BAY ROAD	DUMMER	6 & 7	6

County/District/Municipality	City/Town/Village	Province	Postal Code
PETERBOROUGH	DOUGLAS VIEW	Ontario	K9J 6Z1

UTM Coordinates	Zone	Easting	Northing	GPS Unit Make	Model	Mode of Operation: ☐ Undifferentiated ☒ Averaged
NAD 83	17	721807	4944159	GARMIN	GPS V	☐ Differentiated, specify

Overburden and Bedrock Materials *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	To
GREY	LIMESTONE	CLAY	FRACTURED	0	20
RED	GRAVEL		HARD	20	36
WHITE	SANDY		FRACTURED	36	42
		* ALL MEASUREMENTS ARE APPROXIMATE *			

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
0	20	BENTONITE SLURRY	10 ft³

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Rotary (Air) ☐ Digging
☒ Air percussion ☐ Boring
☐ Other, specify

Water Use

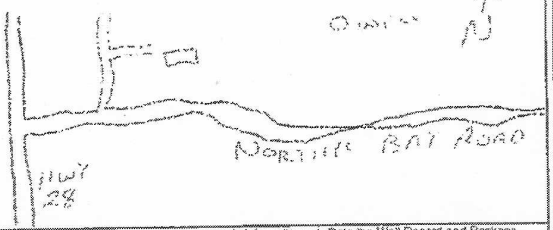
☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☒ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Status of Well

☒ Water Supply ☐ Dewatering Well ☐ Observation and/or Monitoring Hole
☐ Replacement Well ☐ Abandoned, Insufficient Supply ☐ Alteration (Construction)
☐ Test Hole ☐ Abandoned, Poor Water Quality ☐ Other, specify
☐ Recharge Well ☐ Abandoned, other, specify

Location of Well

Please provide a map below showing:
- all property boundaries, and measurements sufficient to locate the well in relation to fixed points,
- an arrow indicating the North direction
- detailed drawings can be provided as attachments no larger than legal size (8.5" by 14")
- digital pictures of inside of well can also be provided



Date Well Completed (yyyy/mm/dd)	Was the well owner's information package delivered?	Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd)
2007/12/19	☐ Yes ☒ No	2007/12/18

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
MARCO WATER WELL	6517 18

Business Address (Street No./Name, number, RR)	Municipality
RR #2 LAKEFIELD	PETERBOROUGH

Province	Postal Code	Business E-mail Address
ONT	K0L 2H0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
705 652 8116	ERIC MARCO

Well Technician's Licence No.	Signature of Technician	Date Submitted (yyyy/mm/dd)
16152		2007/12/20

Results of Well Yield Testing

Check box if after test of well yield, water was:
☒ Clear and sand free
☐ Cannot develop to sand-free state

If pumping discontinued, give reason:

Pumping test method: SUBMERSIBLE

Pump intake set at (Metres): 40'

Pumping rate (Litres/min): 13 GPM

Duration of pumping: 1 hrs + min

Final water level end of pumping (Metres): 24.2 FT

Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump depth: 40' Metres

Recommended pump rate (Litres/min): 12 GPM

If flowing give rate (Litres/min):

	Draw Down Time (Min)	Draw Down Water Level (Metres)	Recovery Time (Min)	Recovery Water Level (Metres)
Static Level		16.9	Static Level	
1	17.3		1	24
2	17.6		2	23.4
3	18		3	—
4	18.5		4	—
5	18.8		5	22
10	19.6		10	—
15	20.5		15	19
20	21.3		20	18.7
25	21.8		25	18.2
30	22		30	18
40	22.8		40	17.8
50	23.4		50	17.3
60	24.2		60	17.4

Water Details

Water found at Depth	Kind of Water
36 Metres ☐ Gas	☒ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Casing Used	Screen Used
☐ Galvanized	☐ Galvanized
☒ Steel	☐ Steel
☐ Fibreglass	☐ Fibreglass
☐ Plastic	☐ Plastic
☐ Concrete	☐ Concrete

No Casing and Screen Used
☒ Open Hole

Disinfected? ☒ Yes ☐ No

Casing and Well Details

Diameter of the Hole (Centimetres)	6"
Depth of the Hole (Metres)	42'
Wall Thickness (Metres)	1.8
Inside Diameter of the Casing (Metres)	6"
Depth of the Casing (Metres)	20'

Ministry Use Only

Audit No.	Well Contractor No.
Z69759	
Date Received (yyyy/mm/dd)	Date of Inspection (yyyy/mm/dd)

Remarks

Appendix D

Grain Size Analysis

Grain Size Distribution Chart

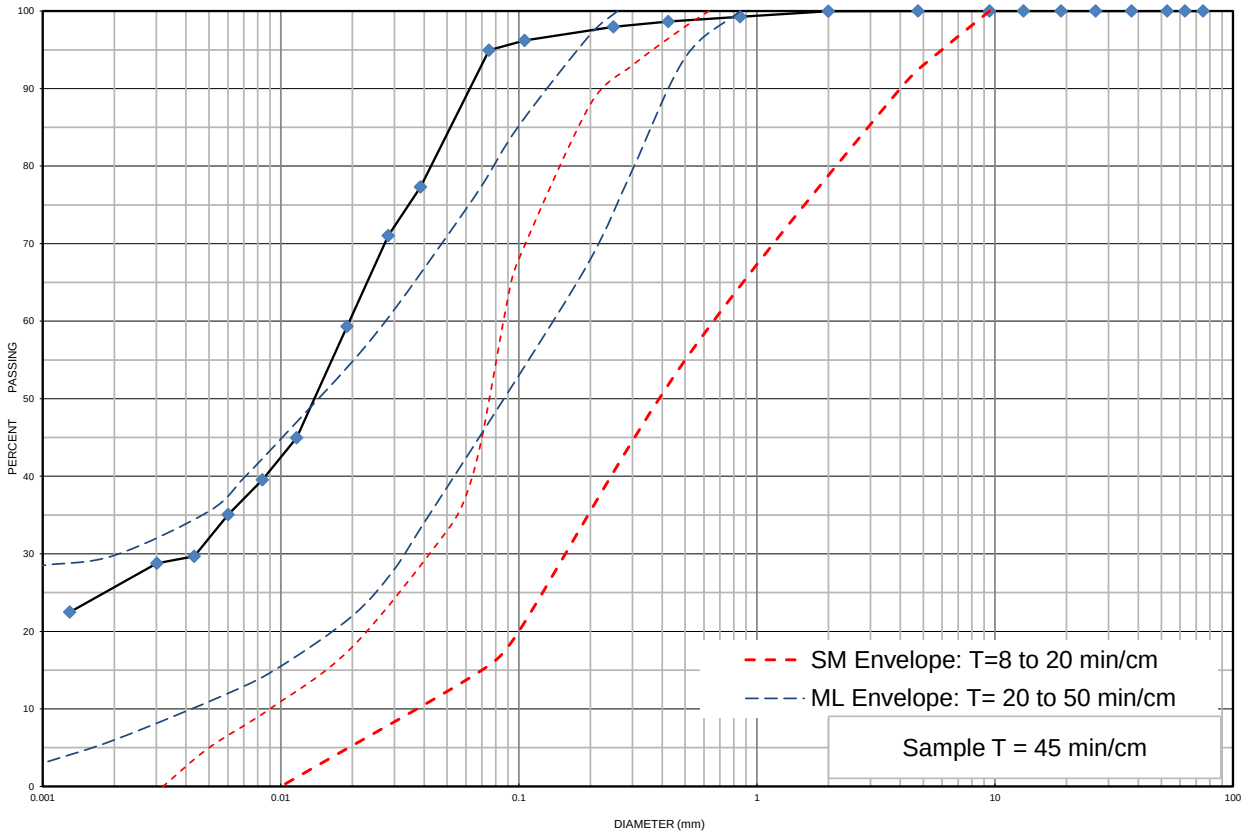
Project Number: *15101-001* **Client:** *Woodview Golf - Eric Challenger*

Project Name: *Hydrogeological & Geotechnical Assessment- Woodview Golf Subdivision*

Sample Date: *November 4, 2022* **Sampled By:** *James Goodwin - Cambium Inc.*

Location: *TP 102-22 GS 2* **Depth:** *0.3 m to 0.4 m* **Lab Sample No:** *S-22-1677*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 102-22	GS 2	0.3 m to 0.4 m	0	5	69	26	23.6

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Clayey Silt trace Sand	ML	0.0190	0.0044	-	-	-

Additional information availabe upon request

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Grain Size Distribution Chart

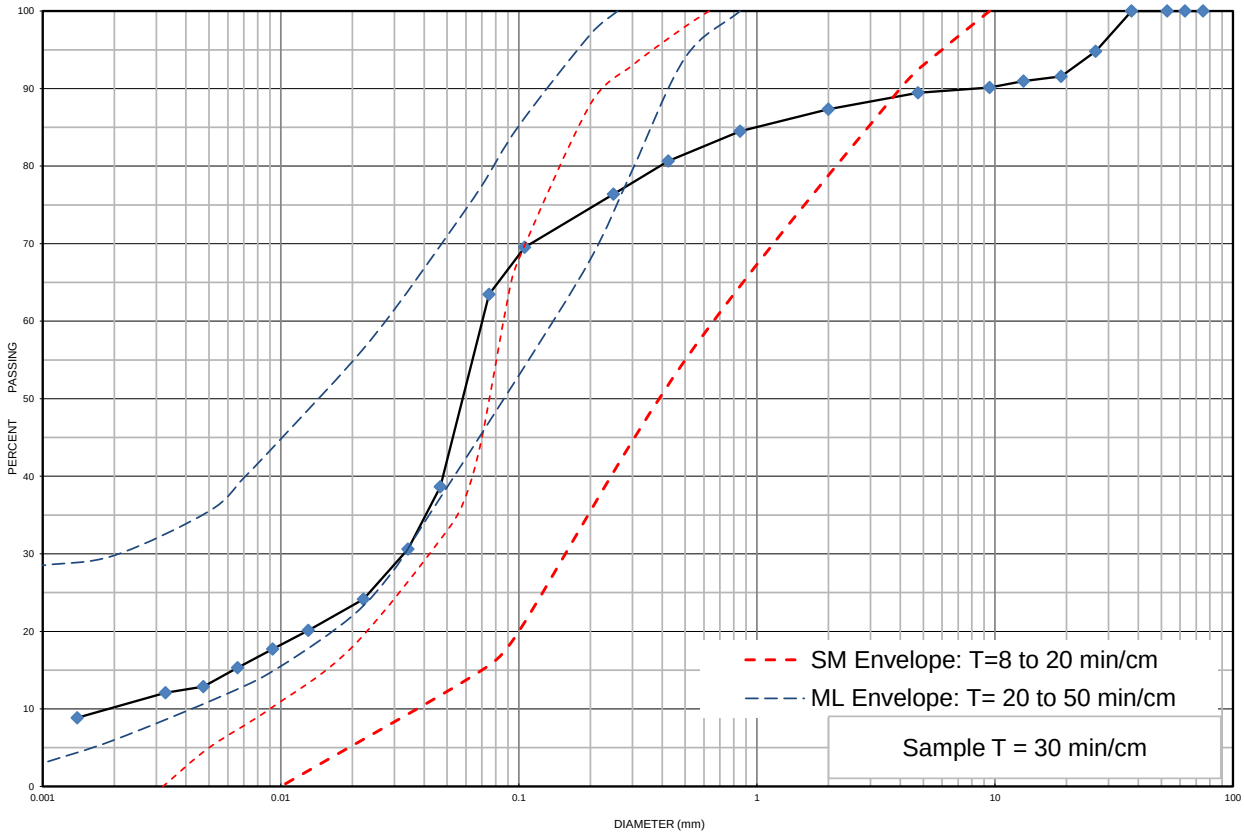
Project Number: *15101-001* **Client:** *Woodview Golf - Eric Challenger*

Project Name: *Hydrogeological & Geotechnical Assessment- Woodview Golf Subdivision*

Sample Date: *November 4, 2022* **Sampled By:** *James Goodwin - Cambium Inc.*

Location: *TP 103-22 GS 2* **Depth:** *0.3 m to 0.5 m* **Lab Sample No:** *S-22-1678*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 103-22	GS 2	0.3 m to 0.5 m	11	26	52	11	8.8

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Silt some Gravel some Clay	ML	0.0700	0.0330	0.0018	38.89	8.64

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Grain Size Distribution Chart

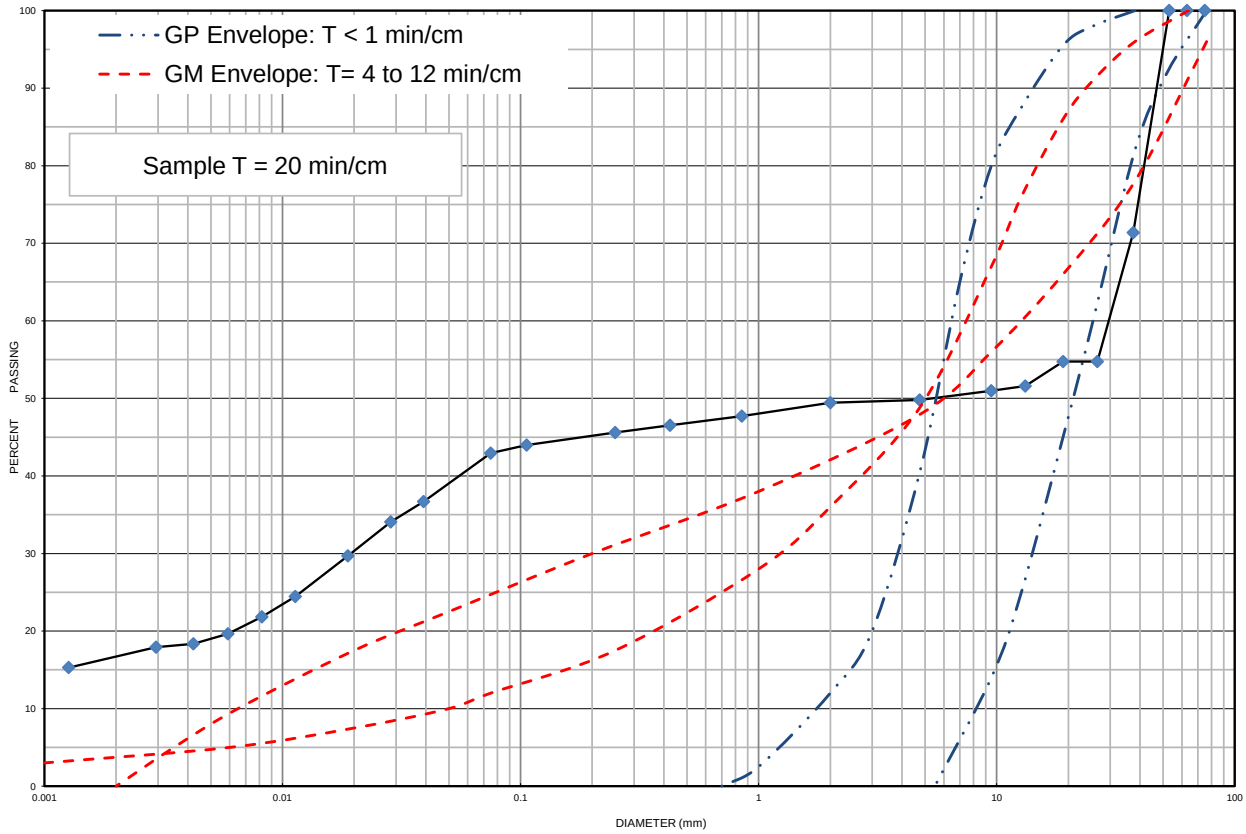
Project Number: *15101-001* **Client:** *Woodview Golf - Eric Challenger*

Project Name: *Hydrogeological & Geotechnical Assessment- Woodview Golf Subdivision*

Sample Date: *November 4, 2022* **Sampled By:** *James Goodwin - Cambium Inc.*

Location: *TP 124-22 GS 2* **Depth:** *25.3 m to 1.1 m* **Lab Sample No:** *S-22-1680*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 124-22	GS 2	25.3 m to 1.1 m	50	7	26	17	10.0

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silty Gravel some Clay trace Sand	GM	30.000	0.019	-	-	-

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Grain Size Distribution Chart

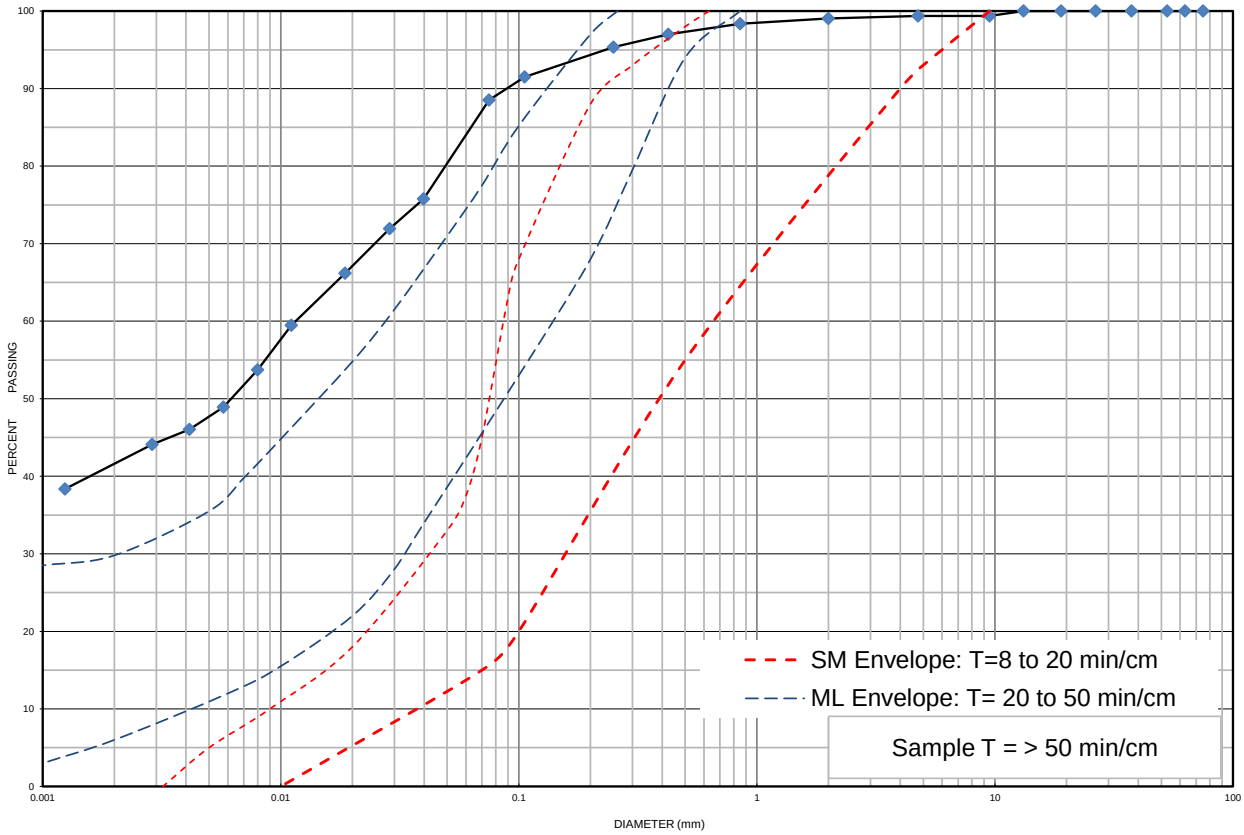
Project Number: *15101-001* **Client:** *Woodview Golf - Eric Challenger*

Project Name: *Hydrogeological & Geotechnical Assessment- Woodview Golf Subdivision*

Sample Date: *November 4, 2022* **Sampled By:** *James Goodwin - Cambium Inc.*

Location: *TP 125-22 GS 2* **Depth:** *0.3 m to 0.7 m* **Lab Sample No:** *S-22-1681*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 125-22	GS 2	0.3 m to 0.7 m	1	11	46	42	34.4

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silt and Clay some Sand trace Gravel	ML	0.012	-	-	-	-

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Grain Size Distribution Chart

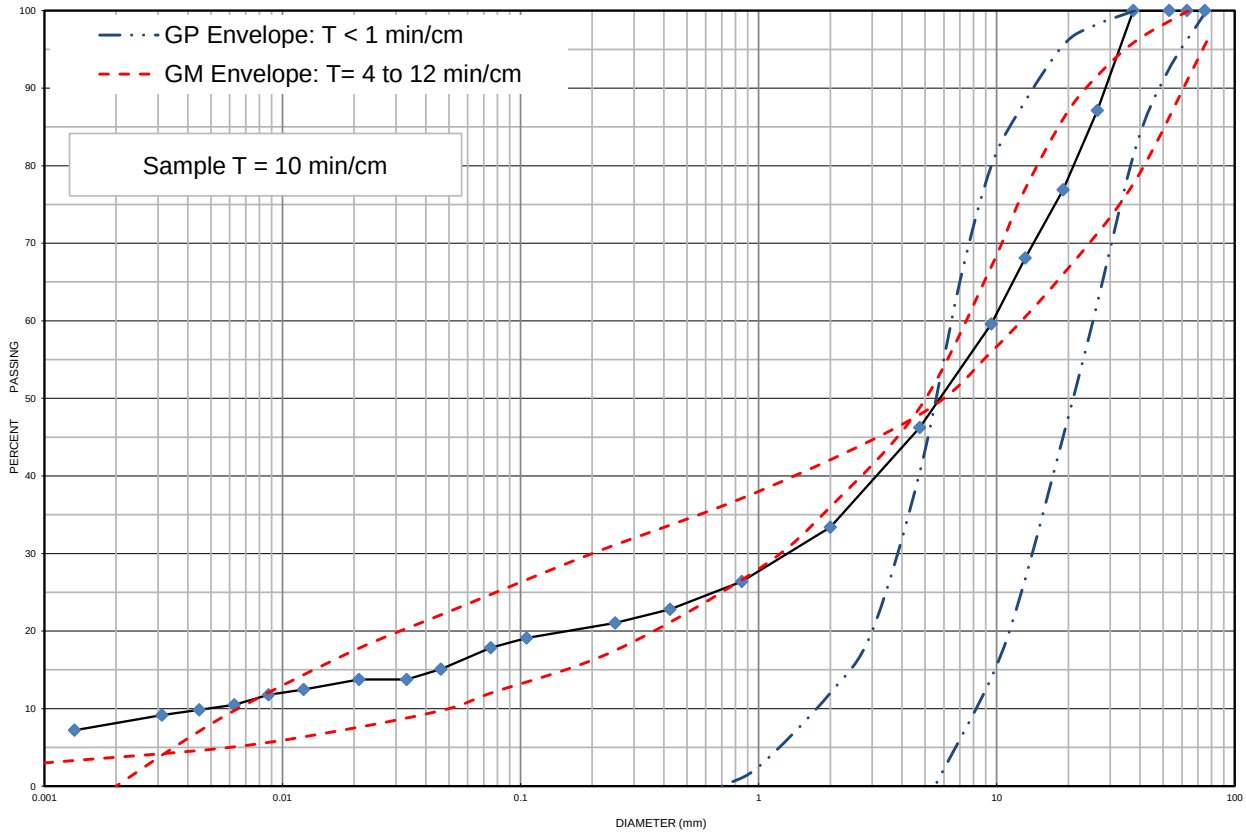
Project Number: *15101-001* **Client:** *Woodview Golf - Eric Challenger*

Project Name: *Hydrogeological & Geotechnical Assessment- Woodview Golf Subdivision*

Sample Date: *November 4, 2022* **Sampled By:** *James Goodwin - Cambium Inc.*

Location: *TP 126-22 GS 2* **Depth:** *0.3 m to 1.1 m* **Lab Sample No:** *S-22-1682*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM									
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 126-22	GS 2	0.3 m to 1.1 m	54	28	10	8	9.5

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Gravel some Silt trace Clay	GM	9.6000	1.4000	0.0047	2042.55	43.44

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Grain Size Distribution Chart

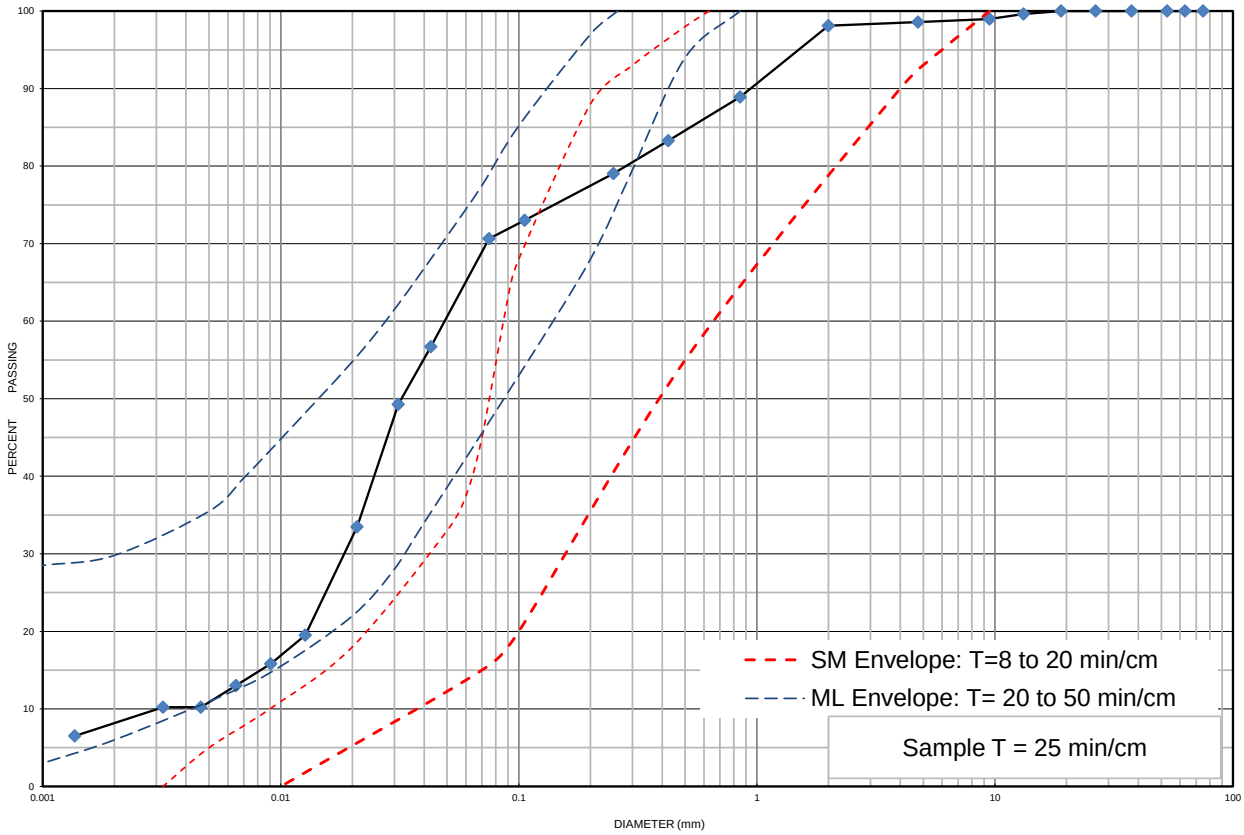
Project Number: *15101-001* **Client:** *Woodview Golf - Eric Challenger*

Project Name: *Hydrogeological & Geotechnical Assessment- Woodview Golf Subdivision*

Sample Date: *November 4, 2022* **Sampled By:** *James Goodwin - Cambium Inc.*

Location: *TP 129-22 GS 1* **Depth:** *0 m to 0.5 m* **Lab Sample No:** *S-22-1683*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 129-22	GS 1	0 m to 0.5 m	1	28	63	8	9.3

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Silt trace Clay trace Gravel	ML	0.049	0.018	0.003	16.33	2.20

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Grain Size Distribution Chart

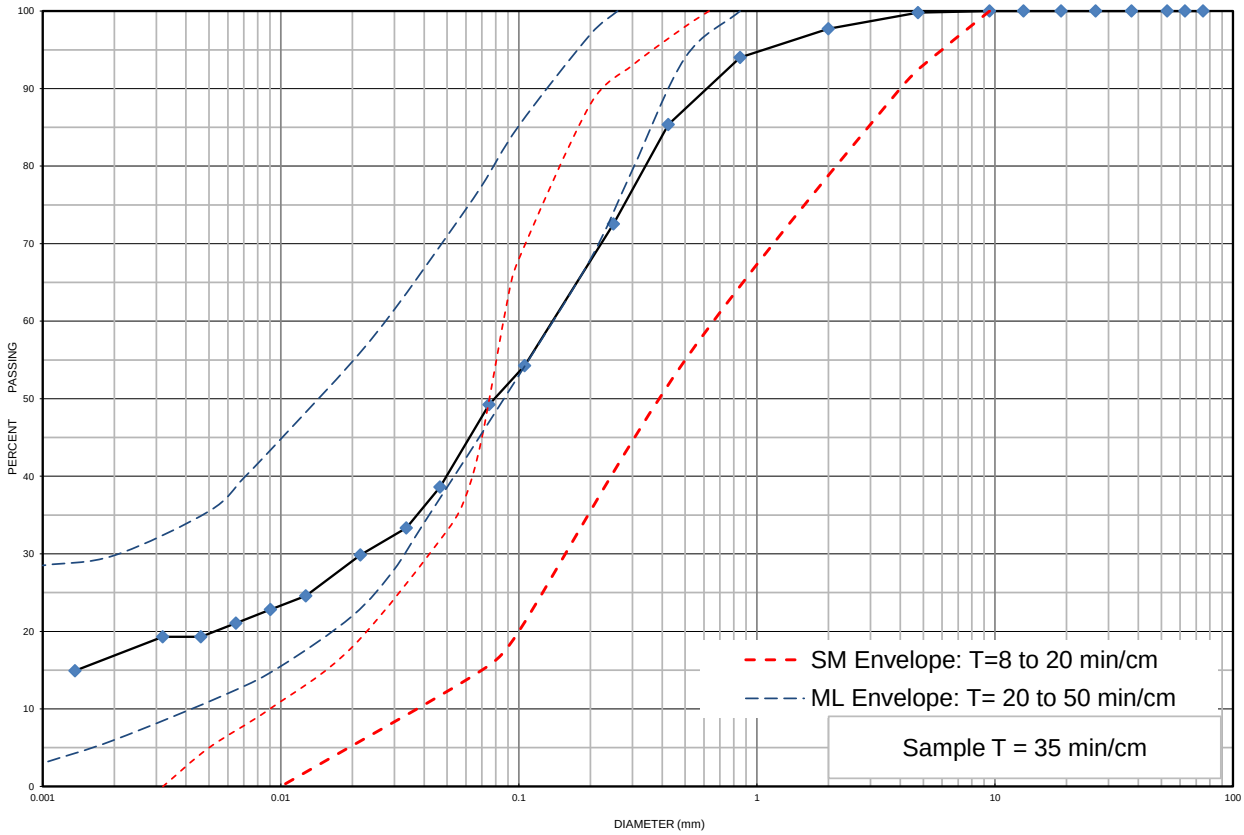
Project Number: *15101-001* **Client:** *Woodview Golf - Eric Challenger*

Project Name: *Hydrogeological & Geotechnical Assessment- Woodview Golf Subdivision*

Sample Date: *November 4, 2022* **Sampled By:** *James Goodwin - Cambium Inc.*

Location: *TP 131-22 GS 2* **Depth:** *0.2 m to 0.4 m* **Lab Sample No:** *S-22-1684*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 131-22	GS 2	0.2 m to 0.4 m	0	51	32	17	20.9

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silty Sand some Clay	SM	0.145	0.022	-	-	-

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Appendix E

MECP Well Records

Water Well Records Summary Report

Produced by Cambium Inc. using MOECP Water Well Information System (WWIS)

All units in meters unless otherwise specified

Well ID: 5100489 **Easting:** 727541 **UTM Zone** 17
Construction Date: 1964-05-25 **Northing:** 4941447 **Positional Accuracy:** margin of error : 100 m - 300 m

Well Depth:	14.0	**Water Kind**	FRESH	**Pump Rate (LPM):**	32
Well Diameter (cm):	15.2	**Final Status**	Water Supply	**Recommended Pump Rate:**	32
Water First Found:	12.2	**Primary Water Use:**	Domestic	**Pumping Duration (h:m):**	1 : 0
Static Level:	9				

Layer:	Driller's Description:	Top:	Bottom:
1	MEDIUM SAND	0	0.91
2	LIMESTONE	0.91	14.0

Well ID: 5100493 **Easting:** 727436 **UTM Zone** 17
Construction Date: 1956-01-13 **Northing:** 4941613 **Positional Accuracy:** unknown UTM

Well Depth:	18.3	**Water Kind**	FRESH	**Pump Rate (LPM):**	5
Well Diameter (cm):	15.2	**Final Status**	Water Supply	**Recommended Pump Rate:**	
Water First Found:	15.9	**Primary Water Use:**	Public	**Pumping Duration (h:m):**	1 : 0
Static Level:	9				

Layer:	Driller's Description:	Top:	Bottom:
1	LIMESTONE	0	18.3

Well ID: 5105607 **Easting:** 727605 **UTM Zone** 17
Construction Date: 1971-06-21 **Northing:** 4942063 **Positional Accuracy:** margin of error : 30 m - 100 m

Well Depth:	18.6	**Water Kind**	FRESH	**Pump Rate (LPM):**	91
Well Diameter (cm):		**Final Status**	Water Supply	**Recommended Pump Rate:**	
Water First Found:	18.6	**Primary Water Use:**	Domestic	**Pumping Duration (h:m):**	72 : 0
Static Level:	17				

Layer:	Driller's Description:	Top:	Bottom:
1	DOLOMITE	0	18.6
1	DOLOMITE	0	18.6

Well ID: 5107514 **Easting:** 727165 **UTM Zone** 17
Construction Date: 1975-07-23 **Northing:** 4941673 **Positional Accuracy:** margin of error : 100 m - 300 m

Well Depth:	46.6	**Water Kind**	FRESH	**Pump Rate (LPM):**	18
Well Diameter (cm):	15.2	**Final Status**	Water Supply	**Recommended Pump Rate:**	18
Water First Found:	40.5	**Primary Water Use:**	Domestic	**Pumping Duration (h:m):**	2 : 30
Static Level:	8				

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	CLAY	0.30	4.27
3	LIMESTONE	4.27	17.4
4	GRANITE	17.4	46.6

Well ID: 5107643
Construction Date: 1975-10-20

Easting: 727515
Northing: 4941623

UTM Zone 17
Positional Accuracy: margin of error : 100 m - 300 m

Well Depth: 44.2
Well Diameter (cm):
Water First Found: 38.1
Static Level: 12

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 5
Recommended Pump Rate: 5
Pumping Duration (h:m): 1 : 30

Layer:	Driller's Description:	Top:	Bottom:
1	PREV. DRILLED	0	13.7
2	LIMESTONE	13.7	44.2

Well ID: 5107704
Construction Date: 1975-12-09

Easting: 727165
Northing: 4941573

UTM Zone 17
Positional Accuracy: margin of error : 100 m - 300 m

Well Depth: 52.4
Well Diameter (cm): 15.2
Water First Found: 25.6
Static Level: 6

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 5
Recommended Pump Rate: 5
Pumping Duration (h:m): 2 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	SAND	0	0.91
2	GRANITE	0.91	25.6
3	GRANITE	25.6	52.4

Well ID: 5107705
Construction Date: 1975-12-09

Easting: 727165
Northing: 4941523

UTM Zone 17
Positional Accuracy: margin of error : 100 m - 300 m

Well Depth: 83.8
Well Diameter (cm):
Water First Found:
Static Level:

Water Kind
Final Status Abandoned-Su
Primary Water Use:

Pump Rate (LPM):
Recommended Pump Rate:
Pumping Duration (h:m):

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	LIMESTONE	0.30	6.40
3	GRANITE	6.40	25.6
4	GRANITE	25.6	83.8

Well ID: 5108131
Construction Date: 1976-09-16

Easting: 727165
Northing: 4941573

UTM Zone 17
Positional Accuracy: margin of error : 100 m - 300 m

Well Depth: 12.2
Well Diameter (cm): 15.2
Water First Found: 6.71
Static Level: 3

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 23
Recommended Pump Rate: 23
Pumping Duration (h:m): 2 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	CLAY	0.30	0.91
3	LIMESTONE	0.91	12.2

Well ID: 5108546
Construction Date: 1977-08-31

Easting: 727915
Northing: 4942323

UTM Zone 17
Positional Accuracy: margin of error : 100 m - 300 m

Well Depth: 10.1
Well Diameter (cm): 15.2
Water First Found: 9.75
Static Level: 4

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 114
Recommended Pump Rate: 23
Pumping Duration (h:m): 3 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	GRANITE	0.30	2.74
3	GRANITE	2.74	10.1

Well ID: 5110164
Construction Date: 1981-03-13

Easting: 727515
Northing: 4941573

UTM Zone 17
Positional Accuracy: margin of error : 100 m - 300 m

Well Depth: 22.9
Well Diameter (cm): 15.2
Water First Found: 22
Static Level: 12

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 36
Recommended Pump Rate: 36
Pumping Duration (h:m): 3 : 10

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	CLAY	0.30	3.05
3	LIMESTONE	3.05	19.8
4	GRANITE	19.8	22.9

Well ID: 5112348
Construction Date: 1987-06-02

Easting: 728294
Northing: 4942017

UTM Zone 17
Positional Accuracy: unknown UTM

Well Depth: 19.8
Well Diameter (cm): 15.2
Water First Found: 17.7
Static Level: 0

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 23
Recommended Pump Rate: 27
Pumping Duration (h:m): 1 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	PEAT	0	1.22
2	DOLOMITE	1.22	19.8

Well ID: 5116135
Construction Date: 1993-03-04

Easting: 728074
Northing: 4942561

UTM Zone 17
Positional Accuracy: unknown UTM

Well Depth: 17.4
Well Diameter (cm): 15.2
Water First Found: 15.2
Static Level: 2

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 68
Recommended Pump Rate: 45
Pumping Duration (h:m): 1 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	UNKNOWN TYPE	0	0.30
2	CLAY	0.30	3.66
3	BOULDERS	3.66	9.14
4	GRANITE	9.14	17.4

Well ID: 5118187
Construction Date: 1999-08-16

Easting: 728294
Northing: 4942017

UTM Zone 17
Positional Accuracy: unknown UTM

Well Depth: 91.4
Well Diameter (cm):
Water First Found: 57.9
Static Level: 6

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 45
Recommended Pump Rate: 45
Pumping Duration (h:m): 1 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	LIMESTONE	0	1.22
2	LIMESTONE	1.22	13.7
o	Dw ! bL¢9	мо◊т	пр◊т
п	Dw ! bL¢9	пр◊т	фм◊п

Well ID: 5119939
Construction Date: 2004-07-09

Easting: 727984
Northing: 4941050

UTM Zone 17
Positional Accuracy: margin of error : 10 - 30 m

Well Depth: 30.5
Well Diameter (cm): 15.9
Water First Found:
Static Level: 4

Water Kind
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 18
Recommended Pump Rate: 18
Pumping Duration (h:m): 1 : 0

Layer:	Driller's Description:	Top:	Bottom:
1		0	1.5
2	LIMESTONE	1.5	14
3	LIMESTONE	14	24.1
4	GRANITE	24.1	30.5

Well ID: 5120069
Construction Date: 2004-12-20

Easting: 727478
Northing: 4941692

UTM Zone 17
Positional Accuracy: margin of error : 10 - 30 m

Well Depth: 67
Well Diameter (cm): 16
Water First Found: 65
Static Level: 10

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 30
Recommended Pump Rate: 45
Pumping Duration (h:m): 1 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	CLAY	0	2
н	[La9{¢hb9	н	мп
o	Dw ! bL¢9	мп	ст

Well ID: 5120141
Construction Date: 2005-01-18

Easting: 727680
Northing: 4941793

UTM Zone 17
Positional Accuracy: unknown UTM

Well Depth: 91
Well Diameter (cm):
Water First Found: 91
Static Level: 8

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 40
Recommended Pump Rate: 40
Pumping Duration (h:m): 1 :

Layer:	Driller's Description:	Top:	Bottom:
1	LIMESTONE	0	0.5
н	LIMESTONE	0¢р	т
о	Dw!bL¢9	т	то
п	Dw!bL¢9	то	ул
р	GRANITE	ул	фм

Well ID: 5120788
Construction Date: 2006-07-24

Easting: 727793
Northing: 4941883

UTM Zone 17
Positional Accuracy: margin of error : 10 - 30 m

Well Depth: 48.8
Well Diameter (cm):
Water First Found: 44.8
Static Level: 5

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 68
Recommended Pump Rate: 45
Pumping Duration (h:m): 1 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	CLAY	0	0.91
н	[La9{¢hb9	0¢фм	т¢он
о	Dw!bL¢9	т¢он	нс¢р
п	Dw!bL¢9	нс¢р	пу¢у

Well ID: 7045863
Construction Date: 2007-06-29

Easting: 727735
Northing: 4941450

UTM Zone 17
Positional Accuracy: margin of error : 10 - 30 m

Well Depth: 88.4
Well Diameter (cm): 16.8
Water First Found: 61
Static Level: 8

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Commerical

Pump Rate (LPM): 27
Recommended Pump Rate: 27
Pumping Duration (h:m): 1 :

Layer:	Driller's Description:	Top:	Bottom:
1	LIMESTONE	0	3.66

н	GRANITE	о◊сс	мм◊о
о	GRANITE	мм◊о	нн
п	GRANITE	нн	39.6
р	GRANITE	оф◊с	пт◊н
с	GRANITE	пт◊н	см
т	GRANITE	см	сн◊р
у	GRANITE	сн◊р	уу◊п

Well ID: 7047985
Construction Date: 2007-08-09

Easting: 728097
Northing: 4941520

UTM Zone 17
Positional Accuracy: margin of error : 10 - 30 m

Well Depth: 19.8
Well Diameter (cm):
Water First Found: 17.7
Static Level: 9

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Commerical

Pump Rate (LPM): 82
Recommended Pump Rate: 73
Pumping Duration (h:m): 1 :

Layer:	Driller's Description:	Top:	Bottom:
1	LIMESTONE	0	3.66
н	LIMESTONE	о◊сс	т◊он
о	Dw ! bL¢9	т◊он	мн◊н
п	Dw ! bL¢9	мн◊н	мт◊т
р	GRANITE	мт◊т	мф◊у

Well ID: 7101360
Construction Date: 2008-01-28

Easting: 728115
Northing: 4941569

UTM Zone 17
Positional Accuracy: margin of error : 10 - 30 m

Well Depth: 31.1
Well Diameter (cm): 16.8
Water First Found: 30.5
Static Level: 4

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Irrigation

Pump Rate (LPM): 2
Recommended Pump Rate: 2
Pumping Duration (h:m): 1 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	LIMESTONE	0	6.1
2	GRANITE	6.1	13.1
3	GRANITE	13.1	28.0
4	GRANITE	28.0	31.1

Well ID: 7101361
Construction Date: 2008-01-28

Easting: 728077
Northing: 4941597

UTM Zone 17
Positional Accuracy: margin of error : 10 - 30 m

Well Depth: 13.1
Well Diameter (cm): 16.8
Water First Found: 11
Static Level: 5

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Irrigation

Pump Rate (LPM): 55
Recommended Pump Rate: 55
Pumping Duration (h:m): 1 : 0

Layer:	Driller's Description:	Top:	Bottom:
1	LIMESTONE	0	6.1
2	GRANITE	6.1	11
3	GRANITE	11	13.1

Well ID: 7225245
Construction Date: 2014-08-11

Easting: 727535
Northing: 4941636

UTM Zone 17
Positional Accuracy: margin of error : 30 m - 100 m

Well Depth: 61
Well Diameter (cm): 15.9
Water First Found: 57.9
Static Level: 14

Water Kind Untested
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 36
Recommended Pump Rate: 36
Pumping Duration (h:m): 1 :

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.61
2	LIMESTONE	0.61	44.2
3	GRANITE	44.2	61

Well ID: 7352477
Construction Date: 2020-01-30

Easting: 727616
Northing: 4941716

UTM Zone 17
Positional Accuracy: margin of error : 30 m - 100 m

Well Depth: 85.3
Well Diameter (cm): 15.9
Water First Found: 83.8
Static Level: 8

Water Kind FRESH
Final Status Water Supply
Primary Water Use: Domestic

Pump Rate (LPM): 45
Recommended Pump Rate: 45
Pumping Duration (h:m): 1 :

Layer:	Driller's Description:	Top:	Bottom:
1	TOPSOIL	0	0.30
2	SHALE	0.30	4.88
3	ROCK	4.88	48.8
4	GRANITE	48.8	79.3
5	GRANITE	79.3	85.3

Appendix F
Water Budget

Water Balance Calculations

THORNTHWAITE-TYPE MONTHLY WATER-BALANCE MODEL													
modified from Dingman 2002: Box 7-3 (pg 315) using ET model of Hamon (1963)													
		Input Data				Computed Values							
										Surplus	355	mm/yr	
Weather Station Location:	**Peterborough Trent U**				**Latitude:**	**44.2**	**degree**						
Solar Declination (degree)	-20.6	-12.6	-1.5	10.0	19.0	23.1	21.0	13.4	2.6	-9.0	-18.5	-23.0	
DayLength (hr)*	9.1	10.3	11.8	13.3	14.6	15.3	14.9	13.8	12.3	10.8	9.5	8.7	
Available Water Storage Capacity	0.18	m/m		**Root Depth**	460	mm		**SOILmax**	82.8	mm			

MONTHLY WATER BALANCE DATA													
Temperatures in C, water-balance terms in mm.													
Month:	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Year**
TEMPERATURE (T)	-8.4	-6.5	-1.3	6.3	12.8	18.0	20.7	19.4	15.0	8.4	2.4	-4.0	
PRECIPITATION (P)	57.3	48.8	56.5	66.4	88.7	83.0	73.6	87.0	92.4	77.0	85.5	66.0	882
RAIN	22.4	23.1	34.0	60.9	88.7	83.0	73.6	87.0	92.4	75.7	73.3	35.0	749
SNOW	35	26	23	6	0	0	0	0	0	1	12	31	133
MELT FACTOR (F)	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.40	0.00	
PACK	73	99	121	0	0	0	0	0	0	0	7	38	
MELT	0	0	0	127	0	0	0	0	0	1	5	0	133
INPUT (W)	22	23	34	188	89	83	74	87	92	77	78	35	882
POTENTIAL ET (PET)	0	0	0	41	70	97	115	98	65	39	22	0	548
NET INPUT (ΔW)	22	23	34	147	19	-14	-41	-11	27	38	56	35	
SOIL MOISTURE (SOIL)	83	83	83	83	83	70	42	37	64	83	83	83	
ΔSOIL	0	0	0	0	0	-13	-27	-5	27	19	0	0	
ET	0	0	0	41	70	96	101	92	65	39	22	0	527
SURPLUS=W-ET-ΔSOIL	22	23	34	147	19	0	0	0	0	19	56	35	355

Notes:

Precipitation, Rain, Temperature, and Latitude are inputted parameters

SOILmax = available water storage capacity * root depth

m = month

D = Day length (hrs) $=2*\cos^{-1}(-\tan(\text{Latitude})*\tan(\text{Declination}))/0.2618$ [calculation is in radians]

$SNOW_m = P_m - RAIN_m$

$F_m = 0$ if $T_m <= 0^oC$; $F_m = 0.167*T_m$ if $0^oC<T_m<6^oC$; $F_m = 1$ if $T_m>=6^oC$

$PACK_m = (1-F_m)*(SNOW_m+PACK_{m-1})$

$MELT = F_m*(SNOW_m+PACK_{m-1})$

$W_m = RAIN_m+MELT_m$.

PET = 0 if $T_m<0$; otherwise $PET = 2.98*0.611*\exp(17.3*T_m/(T_m+237))/(T_m+237.2)*$Number of days in month [Hamon ET model (1963)]

$\Delta W_m = W_m - PET_m$

$SOIL = \min\{[\Delta W_m+SOIL_{m-1}], SOILmax\}$, if $\Delta Wm>0$; otherwise $SOIL = SOIL_{m-1}* \exp(\Delta W/SOILmax)$

$\Delta SOIL = SOIL_{m-1}-SOIL_m$

ET = PET if W_m > PET; otherwise, $ET=W_m-\Delta SOIL$

Areas	Development Area		Nondevelopment Site Area		*Total area	1219083	(m^2)
SITE AREA (m^2)	268000	26.8	951083.4	95.108336			
WETLAND AREA (m^2)	4792	0.4792	478158	47.8158			
PAVED AREA (m^2)	34810.91	3.481091	0	0			
LANDSCAPED AREA (m^2)	228397.1	22.83971	472925.4	47.292536			

Total Infiltration Factors

Development area	0.65	(Flat 0.3, Medium combinations of clay and loam 0.2,Cultivated woodland mix 0.15)
Nondevelopment area	0.5	(Flat 0.3, Tight impervious clay 0.1,Cultivated 0.1)

** This is the total infiltration of which some discharges back to the stream as base flow. The infiltration factor is determined by summing a factor for topography, soils and cover.*

Topography	Flat Land, average slope < 0.6 m/km	0.3
	Rolling Land, average slope 2.8 m to 3.8 m/km	0.2
	Hilly Land, average slope 28 m to 47 m/km	0.1
Soils	Tight impervious clay	0.1
	Medium combinations of clay and loam	0.2
	Open Sandy loam	0.4
Cover	Cultivated Land	0.1
	Woodland	0.2

Source: ON stormwater planning and design manual 2003

Development Area

	Surplus water			Infiltrated water				
Depth from surplus	0.355	m/yr	Depth from surplus	0.23075	m/yr			
	0.0009726	m/day		0.000632	m/day			
From Landscape	81080.97	m^3/yr	Infiltrated from landscape	52702.63	m^3/yr			
	222.1396	m^3/day	Total Water	144.3908	m^3/day	runoff	77.74887	m^3/day

Nondevelopment area

	Surplus water			Infiltrated water				
Depth from surplus	0.355	m/yr	Depth from surplus	0.1775	m/yr			
	9.73E-04	m/day		0.000486	m/day			
From Landscape	167888.5	m^3/yr	Infiltrated from landscape	83944.25	m^3/yr			
	459.9685	m^3/day	Total Water	229.9843	m^3/day	runoff	229.9843	m^3/day
			Sum of Total Water	374.375	m^3/day			

Predicted Nitrate Concentrations

Projected Lots maintaining Nitrate Concentrations 10 mg/L

# Lots	60
Qe	60000
Ce	40
Qi	374375
Ci	0.1
Qt	434375
mg/L	5.61

Appendix G
Water Quality Sampling Results

FINAL REPORT

CA14820-OCT22 R

15101-001, Woodview Golf

Prepared for

Cambium Inc.

FINAL REPORT

CA14820-OCT22 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Cambium Inc.	Project Specialist	Maarit Wolfe, Hon.B.Sc
		Laboratory	SGS Canada Inc.
Address	194 Sophia Street Peterborough, ON K9H 1E5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Kevin Warner	Telephone	705-652-2000
Telephone	705-742-7900	Facsimile	705-652-6365
Facsimile		Email	Maarit.Wolfe@sgs.com
Email	kevin.warner@cambium-inc.com	SGS Reference	CA14820-OCT22
Project	15101-001, Woodview Golf	Received	10/31/2022
Order Number		Approved	11/14/2022
Samples	Ground Water (1)	Report Number	CA14820-OCT22 R
		Date Reported	11/14/2022

COMMENTS

MAC - Maximum Acceptable Concentration
AO/OG - Aesthetic Objective / Operational Guideline
MDL - SGS Method Detection Limit

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 029831

SIGNATORIES

Maarit Wolfe, Hon.B.Sc

TABLE OF CONTENTS

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	8
Sample Name	Neighbours House
Sample Matrix	Ground Water
Sample Date	31/10/2022

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Conductivity	uS/cm	2			1190
Alkalinity	mg/L as CaCO3	2	500		305
Colour	TCU	3	5		< 3
Turbidity	NTU	0.10	5	1	0.30
Dissolved Oxygen	mg/L	1			6.3
Metals and Inorganics					
Sulphate	mg/L	2	500		51
Nitrite (as N)	as N mg/L	0.003		1	0.003#<MDL
Nitrate (as N)	as N mg/L	0.006		10	1.42
Nitrate + Nitrite (as N)	as N mg/L	0.006			1.42
Hardness	mg/L as CaCO3	0.05	100		531
Aluminum	µg/L	1	100		3
Silver	µg/L	0.05			< 0.05
Arsenic	µg/L	0.2		10	< 0.2
Barium	µg/L	0.02		1000	367
Beryllium	µg/L	0.007			0.007
Boron	µg/L	2		5000	92
Bismuth	µg/L	0.01			< 0.01
Calcium	mg/L	0.01			156
Cadmium	µg/L	0.003		5	0.011
Chromium	µg/L	0.08		50	0.29

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	8
Sample Name	Neighbours House
Sample Matrix	Ground Water
Sample Date	31/10/2022

Metals and Inorganics (continued)

Parameter	Units	RL	L1	L2	Result
Cobalt	µg/L	0.004			0.231
Copper	µg/L	0.2	1000		1.5
Iron	ug/L	7	300		20
Potassium	mg/L	0.009			3.44
Lithium	µg/L	0.1			7.7
Sodium	mg/L	0.01	200	20	56.9
Nickel	µg/L	0.1			0.7
Magnesium	mg/L	0.001			34.5
Manganese	µg/L	0.01	50		0.90
Molybdenum	µg/L	0.04			2.98
Phosphorus	mg/L	0.003			< 0.003
Lead	µg/L	0.01		10	0.10
Antimony	µg/L	0.6		6	< 0.6
Selenium	µg/L	0.04		50	0.23
Silicon	ug/L	20			1120
Tin	µg/L	0.06			< 0.06
Strontium	µg/L	0.02			12800
Titanium	ug/L	0.05			0.26
Thallium	µg/L	0.005			0.020
Uranium	µg/L	0.002		20	5.74
Vanadium	µg/L	0.01			0.43

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	8
Sample Name	Neighbours House
Sample Matrix	Ground Water
Sample Date	31/10/2022

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Tungsten	µg/L	0.02			< 0.02
Yttrium	µg/L	0.02			0.05
Zinc	µg/L	2	5000		6
Microbiology					
Total Coliform	cfu/100mL	0		0	0
E. Coli	cfu/100mL	0		0	0
Other (ORP)					
pH	No unit	5	8.5		7.86
Chloride	mg/L	1	250		210

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03 L1	ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03 L2
Neighbours House					
Hardness	SM 3030/EPA 200.8	mg/L as CaCO3	531	100	
Sodium	SM 3030/EPA 200.8	mg/L	56.9		20

QC SUMMARY

QCR_SubCategory

Method: SM 2130 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Turbidity	EWL0031-NOV22	NTU	0.10	< 0.10	0	10	96	90	110	NA		

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0020-NOV22	mg/L as CaCO3	2	< 2	0	20	100	80	120	NA		

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO5051-NOV22	mg/L	1	<1	0	20	106	80	120	95	75	125
Sulphate	DIO5051-NOV22	mg/L	2	<2	2	20	111	80	120	89	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate + Nitrite (as N)	DIO0088-NOV22	mg/L	0.006	<0.006	NA		NA			NA		
Nitrite (as N)	DIO0088-NOV22	mg/L	0.003	<0.003	ND	20	97	90	110	98	75	125
Nitrate (as N)	DIO0088-NOV22	mg/L	0.006	<0.006	ND	20	102	90	110	103	75	125

QC SUMMARY

Colour

Method: SM 2120 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Colour	EWL0035-NOV22	TCU	3	< 3	0	10	100	80	120	NA		

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0020-NOV22	uS/cm	2	< 2	0	20	96	90	110	NA		

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver	EMS0010-NOV22	ug/L	0.05	<0.00005	ND	20	105	90	110	105	70	130
Aluminum	EMS0010-NOV22	ug/L	1	<0.001	1	20	105	90	110	123	70	130
Arsenic	EMS0010-NOV22	ug/L	0.2	<0.0002	3	20	102	90	110	111	70	130
Barium	EMS0010-NOV22	ug/L	0.02	<0.00002	1	20	100	90	110	125	70	130
Beryllium	EMS0010-NOV22	ug/L	0.007	<0.000007	0	20	107	90	110	101	70	130
Boron	EMS0010-NOV22	ug/L	2	<0.002	1	20	106	90	110	101	70	130
Bismuth	EMS0010-NOV22	ug/L	0.01	<0.00001	0	20	96	90	110	94	70	130
Calcium	EMS0010-NOV22	mg/L	0.01	<0.01	1	20	102	90	110	105	70	130
Cadmium	EMS0010-NOV22	ug/L	0.003	<0.000003	0	20	105	90	110	97	70	130
Cobalt	EMS0010-NOV22	ug/L	0.004	<0.000004	3	20	106	90	110	116	70	130
Chromium	EMS0010-NOV22	ug/L	0.08	<0.00008	2	20	102	90	110	121	70	130
Copper	EMS0010-NOV22	ug/L	0.2	<0.0002	18	20	105	90	110	116	70	130
Iron	EMS0010-NOV22	ug/L	7	<0.007	0	20	100	90	110	125	70	130
Potassium	EMS0010-NOV22	mg/L	0.009	<0.009	3	20	100	90	110	110	70	130
Lithium	EMS0010-NOV22	ug/L	0.1	<0.0001	2	20	110	90	110	104	70	130
Magnesium	EMS0010-NOV22	mg/L	0.001	<0.001	1	20	98	90	110	93	70	130
Manganese	EMS0010-NOV22	ug/L	0.01	<0.00001	1	20	105	90	110	107	70	130
Molybdenum	EMS0010-NOV22	ug/L	0.04	<0.00004	0	20	103	90	110	118	70	130
Sodium	EMS0010-NOV22	mg/L	0.01	<0.01	3	20	103	90	110	108	70	130
Nickel	EMS0010-NOV22	ug/L	0.1	<0.0001	4	20	105	90	110	107	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Lead	EMS0010-NOV22	ug/L	0.01	<0.00001	12	20	100	90	110	101	70	130
Phosphorus	EMS0010-NOV22	mg/L	0.003	<0.003	4	20	103	90	110	NV	70	130
Antimony	EMS0010-NOV22	ug/L	0.6	<0.0009	ND	20	105	90	110	124	70	130
Selenium	EMS0010-NOV22	ug/L	0.04	<0.00004	6	20	106	90	110	107	70	130
Silicon	EMS0010-NOV22	ug/L	20	<0.02	4	20	95	90	110	NV	70	130
Tin	EMS0010-NOV22	ug/L	0.06	<0.00006	8	20	108	90	110	NV	70	130
Strontium	EMS0010-NOV22	ug/L	0.02	<0.00002	0	20	102	90	110	102	70	130
Titanium	EMS0010-NOV22	ug/L	0.05	<0.00005	5	20	104	90	110	NV	70	130
Thallium	EMS0010-NOV22	ug/L	0.005	<0.000005	0	20	98	90	110	100	70	130
Uranium	EMS0010-NOV22	ug/L	0.002	<0.000002	3	20	98	90	110	98	70	130
Vanadium	EMS0010-NOV22	ug/L	0.01	<0.00001	15	20	104	90	110	115	70	130
Tungsten	EMS0010-NOV22	ug/L	0.02	<0.00002	ND	20	102	90	110	NV	70	130
Yttrium	EMS0010-NOV22	ug/L	0.02	<0.00002	2	20	104	90	110	NV	70	130
Zinc	EMS0010-NOV22	ug/L	2	<0.002	5	20	100	90	110	111	70	130

QC SUMMARY

Microbiology

Method: OMOE MICROMFDC-E3407A | Internal ref.: ME-CA-IENVIMIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
E. Coli	BAC9011-NOV22	cfu/100mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9011-NOV22	cfu/100mL	-	ACCEPTED	ACCEPTED							

pH

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
pH	EWL0020-NOV22	No unit	5	NA	0		100			NA		

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
↑ Reporting limit raised.
↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 029831 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Katie Marchand
Received Date: OCT 3 1 2022 (mm/dd/yy)
Received Time: 18 : 21 (hr : min)
Received By (signature): KMarchand
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: Ice
Temperature Upon Receipt (°C) 9 . 9 . 9
LAB LIMS #: CA14820-OCT22

REPORT INFORMATION

Company: Cambium Inc
Contact: Kevin Warner
Address: 194 Sophia Street, Peterborough, ON K9H 1E3
Phone: 705 742 7900
Fax:
Email: Kevin.Warner@Cambium-Inc.com

INVOICE INFORMATION

☑ (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

Quotation #:
P.O. #: 15101-001
Project #: Woodview Golf
Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☒ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture:
☐ Table 2 ☐ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ Medium/Fine
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☒ ODWS Not Reportable *See note

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN,Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na-water))	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI)	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Ti,U,V,Zn)	SVOC: PAHs only	SVOC: SVOCs (all incl PAHs, ABNs, CPs)	PCB: PCBs (Total ☐ Aroclor ☐)	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX)	VOC: VOCs (all incl BTEX)	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other)	Other: See Attached Parameters	Other	Other	Other	Other: Sewer Use: (Specify pkg:)	Other: Water Characterization Pkg (General ☐ Extended ☐)	SPLP: Specify tests (☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN)	TCLP: Specify tests (☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.)	COMMENTS:
1	Neighbours House	Oct 31/22	4:20	9	S-W	N											X								
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Warren Young
Relinquished by (NAME): Warren Young
Signature: Warren Young
Signature: Warren Young
Date: 31 / 10 / 22 (mm/dd/yy)
Date: 31 / 10 / 22 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in ... may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at ...available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Cambium Inc.
Peterborough | Barrie
Oshawa | Kingston | Calgary
(866) 217.7900
cambium-inc.com

Project: Woodview Golf (15101-001) Date: oct 31/22

Subject: Parameter List for SGS

Contact: Warren Young

Parameter List

- Total Coliform
- E. Coli
- Alkalinity
- pH
- Conductivity
- Chloride
- Nitrite (as N)
- Nitrate (as N)
- Nitrate + Nitrite (as N)
- Sulphate
- Colour
- Turbidity
- Dissolved Oxygen Content
- Hardness
- Silver (total)
- Aluminum (total)
- Arsenic (total)
- Barium (total)
- Beryllium (total)
- Boron (total)
- Bismuth (total)
- Calcium (total)
- Cadmium (total)
- Cobalt (total)
- Chromium (total)
- Copper (total)
- Iron (total)
- Potassium (total)
- Lithium (total)
- Magnesium (total)
- Manganese (total)
- Molybdenum (total)
- Sodium (total)
- Nickel (total)
- Phosphorus (total)
- Lead (total)
- Antimony (total)
- Selenium (total)
- Silicon (total)
- tin (total)
- Strontium (total)
- Titanium (total)
- Thallium (total)
- Uranium (total)
- Vanadium (total)
- Tungsten (total)
- Yttrium (total)
- Zinc (total)

FINAL REPORT

CA16229-NOV22 R

15101-001, Woodview Golf

Prepared for

Cambium Inc.

FINAL REPORT

CA16229-NOV22 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Cambium Inc.	Project Specialist	Jill Campbell, B.Sc.,GISAS
		Laboratory	SGS Canada Inc.
Address	194 Sophia Street Peterborough, ON K9H 1E5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Kevin Warner	Telephone	2165
Telephone	705-742-7900	Facsimile	705-652-6365
Facsimile		Email	jill.campbell@sgs.com
Email	kevin.warner@cambium-inc.com	SGS Reference	CA16229-NOV22
Project	15101-001, Woodview Golf	Received	11/01/2022
Order Number		Approved	11/14/2022
Samples	Ground Water (1)	Report Number	CA16229-NOV22 R
		Date Reported	11/14/2022

COMMENTS

MAC - Maximum Acceptable Concentration
AO/OG - Aesthetic Objective / Operational Guideline
MDL - SGS Method Detection Limit

Temperature of Sample upon Receipt: 10 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes
Chain of Custody Number: 033288

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

TABLE OF CONTENTS

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

Sample Number	8
Sample Name	Pro Shop
Sample Matrix	Ground Water
Sample Date	01/11/2022

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Alkalinity	mg/L as CaCO3	2	500		335
Colour	TCU	3	5		< 3
Conductivity	uS/cm	2			1140
Turbidity	NTU	0.10	5	1	0.25
Total Dissolved Solids	mg/L	30	500		743
Ammonia+Ammonium (N)	as N mg/L	0.04			< 0.04
Dissolved Organic Carbon	mg/L	1	5		2
Metals and Inorganics					
Sulphate	mg/L	2	500		98
Nitrite (as N)	as N mg/L	0.003		1	0.008
Nitrate (as N)	as N mg/L	0.006		10	2.89
Nitrate + Nitrite (as N)	as N mg/L	0.006			2.90
Hardness	mg/L as CaCO3	0.05	100		515
Silver	µg/L	0.05			< 0.05
Aluminum	µg/L	1	100		7
Arsenic	µg/L	0.2		10	< 0.2
Barium	µg/L	0.02		1000	252
Beryllium	µg/L	0.007			0.018
Boron	µg/L	2		5000	123
Bismuth	µg/L	0.01			< 0.01
Calcium	mg/L	0.01			163
Cadmium	µg/L	0.003		5	0.008

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

Sample Number	8
Sample Name	Pro Shop
Sample Matrix	Ground Water
Sample Date	01/11/2022

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Metals and Inorganics (continued)

Parameter	Units	RL	L1	L2	Result
Chromium	µg/L	0.08		50	0.57
Cobalt	µg/L	0.004			0.352
Copper	µg/L	0.2	1000		2.9
Iron	ug/L	7	300		20
Potassium	mg/L	0.009			2.11
Lithium	µg/L	0.1			9.0
Sodium	mg/L	0.01	200	20	64.2
Magnesium	mg/L	0.001			26.1
Manganese	µg/L	0.01	50		1.27
Molybdenum	µg/L	0.04			2.56
Nickel	µg/L	0.1			0.7
Phosphorus	mg/L	0.003			< 0.003
Lead	µg/L	0.01		10	0.04
Antimony	µg/L	0.6		6	< 0.6
Selenium	µg/L	0.04		50	0.26
Silicon	ug/L	20			2992
Tin	µg/L	0.06			< 0.06
Strontium	µg/L	0.02			11100
Titanium	ug/L	0.05			0.42
Thallium	µg/L	0.005			0.006
Uranium	µg/L	0.002		20	2.80
Vanadium	µg/L	0.01			0.10

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

Sample Number 8
Sample Name Pro Shop
Sample Matrix Ground Water
Sample Date 01/11/2022

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Tungsten	µg/L	0.02			< 0.02
Yttrium	µg/L	0.02			0.14
Zinc	µg/L	2	5000		5
Microbiology					
Total Coliform	cfu/100mL	0		0	0
E. Coli	cfu/100mL	0		0	0
Other (ORP)					
pH	No unit	5	8.5		7.54
Chloride	mg/L	1	250		180

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03 L1	ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03 L2
Pro Shop					
Total Dissolved Solids	SM 2540C	mg/L	743	500	
Hardness	SM 3030/EPA 200.8	mg/L as CaCO3	515	100	
Sodium	SM 3030/EPA 200.8	mg/L	64.2		20

QC SUMMARY

QCR_SubCategory

Method: SM 2130 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Turbidity	EWL0068-NOV22	NTU	0.10	< 0.10	0	10	100	90	110	NA		

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0070-NOV22	mg/L as CaCO3	2	< 2	2	20	100	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0067-NOV22	mg/L	0.04	<0.04	ND	10	101	90	110	91	75	125

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO5053-NOV22	mg/L	1	<1	0	20	101	80	120	94	75	125
Sulphate	DIO5053-NOV22	mg/L	2	<2	1	20	108	80	120	79	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate + Nitrite (as N)	DIO0111-NOV22	mg/L	0.006	<0.006	NA		NA			NA		
Nitrite (as N)	DIO0111-NOV22	mg/L	0.003	<0.003	18	20	98	90	110	107	75	125
Nitrate (as N)	DIO0111-NOV22	mg/L	0.006	<0.006	0	20	100	90	110	92	75	125

QC SUMMARY

Carbon by SFA

Method: SM 5310 I Internal ref.: ME-CA-[ENV]SFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0076-NOV22	mg/L	1	<1	4	10	100	90	110	93	75	125

Colour

Method: SM 2120 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Colour	EWL0083-NOV22	TCU	3	< 3	ND	10	105	80	120	NA		

Conductivity

Method: SM 2510 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0070-NOV22	uS/cm	2	< 2	0	20	100	90	110	NA		

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver	EMS0034-NOV22	ug/L	0.05	< 0.05	ND	20	102	90	110	101	70	130
Aluminum	EMS0034-NOV22	ug/L	1	< 1	0	20	105	90	110	79	70	130
Arsenic	EMS0034-NOV22	ug/L	0.2	< 0.2	3	20	102	90	110	107	70	130
Barium	EMS0034-NOV22	ug/L	0.02	< 0.02	2	20	105	90	110	101	70	130
Beryllium	EMS0034-NOV22	ug/L	0.007	< 0.07	ND	20	99	90	110	97	70	130
Boron	EMS0034-NOV22	ug/L	2	< 2	5	20	104	90	110	NV	70	130
Bismuth	EMS0034-NOV22	ug/L	0.01	< 0.01	ND	20	104	90	110	94	70	130
Calcium	EMS0034-NOV22	mg/L	0.01	< 0.02	1	20	102	90	110	101	70	130
Cadmium	EMS0034-NOV22	ug/L	0.003	< 0.003	ND	20	101	90	110	103	70	130
Cobalt	EMS0034-NOV22	ug/L	0.004	< 0.004	0	20	99	90	110	96	70	130
Chromium	EMS0034-NOV22	ug/L	0.08	< 0.08	ND	20	103	90	110	108	70	130
Copper	EMS0034-NOV22	ug/L	0.2	< 0.2	0	20	99	90	110	99	70	130
Iron	EMS0034-NOV22	ug/L	7	< 7	ND	20	104	90	110	75	70	130
Potassium	EMS0034-NOV22	mg/L	0.009	< 0.009	0	20	109	90	110	NV	70	130
Lithium	EMS0034-NOV22	ug/L	0.1	< 0.1	3	20	100	90	110	93	70	130
Magnesium	EMS0034-NOV22	mg/L	0.001	< 0.001	2	20	101	90	110	102	70	130
Manganese	EMS0034-NOV22	ug/L	0.01	< 0.01	1	20	103	90	110	94	70	130
Molybdenum	EMS0034-NOV22	ug/L	0.04	< 0.04	16	20	103	90	110	96	70	130
Sodium	EMS0034-NOV22	mg/L	0.01	< 0.01	0	20	102	90	110	100	70	130
Nickel	EMS0034-NOV22	ug/L	0.1	< 0.1	ND	20	102	90	110	97	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Lead	EMS0034-NOV22	ug/L	0.01	< 0.01	12	20	104	90	110	99	70	130
Phosphorus	EMS0034-NOV22	mg/L	0.003	< 0.003	ND	20	101	90	110	NV	70	130
Antimony	EMS0034-NOV22	ug/L	0.6	< 0.09	ND	20	106	90	110	101	70	130
Selenium	EMS0034-NOV22	ug/L	0.04	< 0.04	2	20	102	90	110	118	70	130
Silicon	EMS0034-NOV22	ug/L	20	< 0.02	0	20	102	90	110	NV	70	130
Tin	EMS0034-NOV22	ug/L	0.06	< 0.06	ND	20	101	90	110	NV	70	130
Strontium	EMS0034-NOV22	ug/L	0.02	< 0.02	0	20	100	90	110	100	70	130
Titanium	EMS0034-NOV22	ug/L	0.05	< 0.05	ND	20	103	90	110	NV	70	130
Thallium	EMS0034-NOV22	ug/L	0.005	< 0.005	ND	20	102	90	110	98	70	130
Uranium	EMS0034-NOV22	ug/L	0.002	< 0.002	12	20	101	90	110	100	70	130
Vanadium	EMS0034-NOV22	ug/L	0.01	< 0.01	2	20	101	90	110	100	70	130
Tungsten	EMS0034-NOV22	ug/L	0.02	< 0.02	ND	20	98	90	110	NV	70	130
Yttrium	EMS0034-NOV22	ug/L	0.02	< 0.02	ND	20	100	90	110	NV	70	130
Zinc	EMS0034-NOV22	ug/L	2	< 2	1	20	101	90	110	104	70	130

QC SUMMARY

Microbiology

Method: OMOE MICROMFDC-E3407A | Internal ref.: ME-CA-[ENV]MIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
E. Coli	BAC9064-NOV22	cfu/100mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9064-NOV22	cfu/100mL	-	ACCEPTED	ACCEPTED							

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
pH	EWL0070-NOV22	No unit	5	NA	0		100			NA		

QC SUMMARY

Solids Analysis

Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0129-NOV22	mg/L	30	<30	2	20	98	90	110	NA		

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
↑ Reporting limit raised.
↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 033288 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Kate Marchand
Received By (signature): KMarchand
Received Date: 11 / 01 / 22 (mm/dd/yy)
Received Time: 17 : 38 (hr : min)
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: Ice
Temperature Upon Receipt (°C) 9 . 10 . 10
LAB LIMS #: CA-1629-Nov2

REPORT INFORMATION	INVOICE INFORMATION
Company: Cambium Inc	☒ (same as Report Information)
Contact: Kevin Warner	Company:
Address: 194 Sophia Street, Peterborough, ON K9H 1E3	Contact:
Phone: 705 742 7900	Address:
Fax:	Phone:
Email: Kevin.Warner@cambium-inc.com	Email:

Quotation #:
P.O. #: 15101-001
Project #: Woodview Golf
Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☒ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture:
☐ Table 2 ☐ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ Medium/Fine
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☒ ODWS Not Reportable *See note

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN,Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na–water))	M&I: Full Metals Suite (ICP metals plus B(HWS–soil only) Hg, CrVI)	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn)	SVOC: PAHs only	SVOC: SVOCs (all incl PAHs, ABNs, CPs)	PCB: PCBs (Total ☐ Aroclor ☐)	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX)	VOC: VOCs (all incl BTEX)	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other)	Other: See Attached Parameters	Other	Other	Other	Other: Sewer Use: (Specify pkg:)	Other: Water Characterization Pkg (General ☐ Extended ☐)	SPLP: Specify tests (☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN)	TCLP: Specify tests (☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.)	COMMENTS:
1	Pro Shop	Nov 1/22	3:10	9	GW	N											X								
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Warren Young Signature: Warren Young Date: 11 / 01 / 22 (mm/dd/yy)
Relinquished by (NAME): Warren Young Signature: Warren Young Date: 11 / 01 / 22 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.6
Date of Issue: 02 May 2022

Project: Woodview Golf, Project Number:15101-001 Nov 1/22

Parameter List

Total Coliform
E. Coli
Alkalinity
pH
Conductivity
Chloride
Nitrite (as N)
Nitrate (as N)
Nitrate + Nitrite (as N)
Sulphate
Colour
Turbidity
Dissolved Organic Carbon
Ammonia+Ammonium (N)
Total Dissolved Solids
Hardness
Silver (total)
Aluminum (total)
Arsenic (total)
Barium (total)
Beryllium (total)
Boron (total)
Bismuth (total)
Calcium (total)
Cadmium (total)
Cobalt (total)
Chromium (total)
Copper (total)
Iron (total)
Potassium (total)
Lithium (total)
Magnesium (total)
Manganese (total)
Molybdenum (total)
Sodium (total)
Nickel (total)
Phosphorus (total)
Lead (total)
Antimony (total)
Selenium (total)
Silicon (total)
Tin (total)
Strontium (total)
Titanium (total)
Thallium (total)
Uranium (total)
Vanadium (total)
Tungsten (total)
Yttrium (total)
Zinc (total)

FINAL REPORT

CA14054-NOV22 R

15101-001, Woodview Golf

Prepared for

Cambium Inc.

FINAL REPORT

CA14054-NOV22 R

First Page

CLIENT DETAILS

Client	Cambium Inc.
Address	194 Sophia Street Peterborough, ON K9H 1E5. Canada
Contact	Kevin Warner
Telephone	705-742-7900
Facsimile	
Email	kevin.warner@cambium-inc.com
Project	15101-001, Woodview Golf
Order Number	
Samples	Ground Water (1)

LABORATORY DETAILS

Project Specialist	Jill Campbell, B.Sc.,GISAS
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	2165
Facsimile	705-652-6365
Email	jill.campbell@sgs.com
SGS Reference	CA14054-NOV22
Received	11/02/2022
Approved	11/14/2022
Report Number	CA14054-NOV22 R
Date Reported	11/14/2022

COMMENTS

MAC - Maximum Acceptable Concentration
AO/OG - Aesthetic Objective / Operational Guideline
MDL - SGS Method Detection Limit

Total and/or Free Residual Chlorine was not analyzed by SGS Environmental Services.
Temperature of Sample upon Receipt: 10 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes
Chain of Custody Number: 024629

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

TABLE OF CONTENTS

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

Sample Number	8
Sample Name	North Well
Sample Matrix	Ground Water
Sample Date	02/11/2022

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Alkalinity	mg/L as CaCO3	2	500		331
Colour	TCU	3	5		< 3
Conductivity	uS/cm	2			627
Turbidity	NTU	0.10	5	1	< 0.10
Total Dissolved Solids	mg/L	30	500		420
Ammonia+Ammonium (N)	as N mg/L	0.04			< 0.04
Dissolved Organic Carbon	mg/L	1	5		2
Metals and Inorganics					
Sulphate	mg/L	2	500		13
Nitrite (as N)	as N mg/L	0.003		1	0.003#<MDL
Nitrate (as N)	as N mg/L	0.006		10	1.98
Nitrate + Nitrite (as N)	as N mg/L	0.006			1.98
Hardness	mg/L as CaCO3	0.05	100		345
Silver	µg/L	0.05			< 0.05
Aluminum	µg/L	1	100		< 1
Arsenic	µg/L	0.2		10	< 0.2
Barium	µg/L	0.02		1000	428
Beryllium	µg/L	0.007			0.008
Bismuth	µg/L	0.01			< 0.01
Boron	µg/L	2		5000	41
Calcium	mg/L	0.01			98.4
Cadmium	µg/L	0.003		5	0.004

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

Sample Number	8
Sample Name	North Well
Sample Matrix	Ground Water
Sample Date	02/11/2022

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Metals and Inorganics (continued)

Parameter	Units	RL	L1	L2	Result
Cobalt	µg/L	0.004			0.022
Chromium	µg/L	0.08		50	0.24
Copper	µg/L	0.2	1000		1.4
Iron	ug/L	7	300		< 7
Potassium	mg/L	0.009			1.46
Lithium	µg/L	0.1			6.1
Sodium	mg/L	0.01	200	20	3.12
Magnesium	mg/L	0.001			24.1
Manganese	µg/L	0.01	50		0.09
Molybdenum	µg/L	0.04			0.22
Nickel	µg/L	0.1			0.2
Phosphorus	mg/L	0.003			< 0.003
Lead	µg/L	0.01		10	0.02
Antimony	µg/L	0.6		6	< 0.6
Selenium	µg/L	0.04		50	0.14
Silicon	ug/L	20			3470
Tin	µg/L	0.06			< 0.06
Strontium	µg/L	0.02			1440
Titanium	ug/L	0.05			< 0.05
Thallium	µg/L	0.005			0.026
Uranium	µg/L	0.002		20	1.30
Vanadium	µg/L	0.01			0.45

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	8
Sample Name	North Well
Sample Matrix	Ground Water
Sample Date	02/11/2022

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Tungsten	µg/L	0.02			< 0.02
Yttrium	µg/L	0.02			0.06
Zinc	µg/L	2	5000		3
Microbiology					
Total Coliform	cfu/100mL	0		0	0
E. Coli	cfu/100mL	0		0	0
Other (ORP)					
pH	No unit	5	8.5		7.88
Chloride	mg/L	1	250		15

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03 L1	ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03 L2
North Well					
Hardness	SM 3030/EPA 200.8	mg/L as CaCO3	345	100	

QC SUMMARY

QCR_SubCategory

Method: SM 2130 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Turbidity	EWL0095-NOV22	NTU	0.10	< 0.10	0	10	96	90	110	NA		

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0080-NOV22	mg/L as CaCO3	2	< 2	ND	20	104	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0069-NOV22	mg/L	0.04	0.05	ND	10	97	90	110	88	75	125

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO5050-NOV22	mg/L	1	<1	0	20	106	80	120	82	75	125
Sulphate	DIO5050-NOV22	mg/L	2	<2	3	20	111	80	120	91	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate + Nitrite (as N)	DIO0114-NOV22	mg/L	0.006	<0.006	NA		NA			NA		
Nitrite (as N)	DIO0114-NOV22	mg/L	0.003	<0.003	ND	20	96	90	110	99	75	125
Nitrate (as N)	DIO0114-NOV22	mg/L	0.006	<0.006	0	20	100	90	110	95	75	125

QC SUMMARY

Carbon by SFA

Method: SM 5310 I Internal ref.: ME-CA-[ENV]SFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0076-NOV22	mg/L	1	<1	4	10	100	90	110	93	75	125

Colour

Method: SM 2120 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Colour	EWL0083-NOV22	TCU	3	< 3	ND	10	105	80	120	NA		

Conductivity

Method: SM 2510 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0080-NOV22	uS/cm	2	< 2	1	20	100	90	110	NA		

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver	EMS0052-NOV22	ug/L	0.05	<0.00005	ND	20	101	90	110	98	70	130
Aluminum	EMS0052-NOV22	ug/L	1	<0.001	2	20	101	90	110	102	70	130
Arsenic	EMS0052-NOV22	ug/L	0.2	<0.0002	ND	20	101	90	110	104	70	130
Barium	EMS0052-NOV22	ug/L	0.02	<0.00002	1	20	99	90	110	85	70	130
Beryllium	EMS0052-NOV22	ug/L	0.007	<0.000007	13	20	102	90	110	87	70	130
Boron	EMS0052-NOV22	ug/L	2	<0.002	1	20	100	90	110	103	70	130
Bismuth	EMS0052-NOV22	ug/L	0.01	<0.00001	0	20	97	90	110	71	70	130
Calcium	EMS0052-NOV22	mg/L	0.01	<0.01	0	20	96	90	110	92	70	130
Cadmium	EMS0052-NOV22	ug/L	0.003	<0.000003	5	20	99	90	110	98	70	130
Cobalt	EMS0052-NOV22	ug/L	0.004	<0.000004	1	20	98	90	110	95	70	130
Chromium	EMS0052-NOV22	ug/L	0.08	<0.00008	14	20	98	90	110	106	70	130
Copper	EMS0052-NOV22	ug/L	0.2	<0.0002	0	20	102	90	110	99	70	130
Iron	EMS0052-NOV22	ug/L	7	<0.007	ND	20	93	90	110	100	70	130
Potassium	EMS0052-NOV22	mg/L	0.009	<0.009	1	20	91	90	110	87	70	130
Lithium	EMS0052-NOV22	ug/L	0.1	<0.0001	11	20	101	90	110	87	70	130
Magnesium	EMS0052-NOV22	mg/L	0.001	<0.001	2	20	91	90	110	87	70	130
Manganese	EMS0052-NOV22	ug/L	0.01	<0.00001	0	20	101	90	110	95	70	130
Molybdenum	EMS0052-NOV22	ug/L	0.04	<0.00004	8	20	102	90	110	105	70	130
Sodium	EMS0052-NOV22	mg/L	0.01	<0.01	4	20	91	90	110	89	70	130
Nickel	EMS0052-NOV22	ug/L	0.1	<0.0001	2	20	99	90	110	96	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Lead	EMS0052-NOV22	ug/L	0.01	<0.00001	2	20	98	90	110	86	70	130
Phosphorus	EMS0052-NOV22	mg/L	0.003	<0.003	20	20	93	90	110	NV	70	130
Antimony	EMS0052-NOV22	ug/L	0.6	<0.0009	ND	20	104	90	110	112	70	130
Selenium	EMS0052-NOV22	ug/L	0.04	<0.00004	5	20	102	90	110	95	70	130
Silicon	EMS0052-NOV22	ug/L	20	<0.02	2	20	99	90	110	NV	70	130
Tin	EMS0052-NOV22	ug/L	0.06	<0.00006	14	20	101	90	110	NV	70	130
Strontium	EMS0052-NOV22	ug/L	0.02	<0.00002	0	20	99	90	110	95	70	130
Titanium	EMS0052-NOV22	ug/L	0.05	<0.00005	0	20	99	90	110	NV	70	130
Thallium	EMS0052-NOV22	ug/L	0.005	<0.000005	15	20	98	90	110	83	70	130
Uranium	EMS0052-NOV22	ug/L	0.002	<0.000002	2	20	98	90	110	86	70	130
Vanadium	EMS0052-NOV22	ug/L	0.01	<0.00001	11	20	99	90	110	95	70	130
Tungsten	EMS0052-NOV22	ug/L	0.02	<0.00002	ND	20	104	90	110	NV	70	130
Yttrium	EMS0052-NOV22	ug/L	0.02	<0.00002	6	20	101	90	110	NV	70	130
Zinc	EMS0052-NOV22	ug/L	2	<0.002	1	20	110	90	110	100	70	130

QC SUMMARY

Microbiology

Method: OMOE MICROMFDC-E3407A | Internal ref.: ME-CA-[ENV]MIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
E. Coli	BAC9066-NOV22	cfu/100mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9066-NOV22	cfu/100mL	-	ACCEPTED	ACCEPTED							

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
pH	EWL0080-NOV22	No unit	5	NA	0		100			NA		

QC SUMMARY

Solids Analysis

Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0141-NOV22	mg/L	30	<30	7	20	94	90	110	NA		

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 024629 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Emily Lawrence
Received Date: 11/02/22 (mm/dd/yy)
Received Time: 17:34 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ICE
Temperature Upon Receipt (°C): 11.10.9
LAB LIMS #: CA14054-NOV22

REPORT INFORMATION

Company: Cambium Inc
Contact: Kevin Warner
Address: 194 Sophia Street, Peterborough, ON K9H 1E3
Phone: 705 742 7900
Fax:
Email: Kevin.Warner@cambium-inc.com

INVOICE INFORMATION

☑ (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

Quotation #:
P.O. #: 15101-001
Project #: Woodview Golf
Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends).
Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture:
☐ Table 2 ☐ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ Medium/Fine
☐ Table ____ Appx. ____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☒ ODWS Not Reportable *See note

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics (Incl CrVI, CN,Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na-water)	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	SVOC: PAHs only	SVOC: SVOCs (all Incl PAHs, ABNs, CPs	PCB: PCBs Aroclor ☐ Total ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX	VOC: VOCs (all Incl BTEX	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other	Other: See Attached Parameters	Other	Other	Other	Other: Sewer Use: (Specify pkg:)	Other: Water Characterization Pkg (General ☐ Extended ☐)	SPLP: Specify tests (☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN)	TCLP: Specify tests (☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.)	COMMENTS:
1	North Well	Nov 2/22	3:45	9	GW	N												X								
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

Observations/Comments/Special Instructions

Sampled By (NAME): Warren Young Signature: Warren Young Date: 11/02/22 (mm/dd/yy)
Relinquished by (NAME): Warren Young Signature: Warren Young Date: 11/02/22 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.5
Date of Issue: 11 June 2021

FINAL REPORT

CA14067-NOV22 R

15101-001, Woodview Golf

Prepared for

Cambium Inc.

FINAL REPORT

CA14067-NOV22 R

First Page

CLIENT DETAILS

Client	Cambium Inc.
Address	194 Sophia Street Peterborough, ON K9H 1E5. Canada
Contact	Kevin Warner
Telephone	705-742-7900
Facsimile	
Email	kevin.warner@cambium-inc.com
Project	15101-001, Woodview Golf
Order Number	
Samples	Ground Water (1)

LABORATORY DETAILS

Project Specialist	Jill Campbell, B.Sc.,GISAS
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	2165
Facsimile	705-652-6365
Email	jill.campbell@sgs.com
SGS Reference	CA14067-NOV22
Received	11/03/2022
Approved	11/15/2022
Report Number	CA14067-NOV22 R
Date Reported	11/15/2022

COMMENTS

MAC - Maximum Acceptable Concentration
AO/OG - Aesthetic Objective / Operational Guideline
MDL - SGS Method Detection Limit

Temperature of Sample upon Receipt: 11 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes
Chain of Custody Number: 033289

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

TABLE OF CONTENTS

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

Sample Number	8
Sample Name	West Pond
Sample Matrix	Ground Water
Sample Date	03/11/2022

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Alkalinity	mg/L as CaCO3	2	500		281
Colour	TCU	3	5		3
Conductivity	uS/cm	2			708
Turbidity	NTU	0.10	5	1	0.25
Total Dissolved Solids	mg/L	30	500		477
Ammonia+Ammonium (N)	as N mg/L	0.04			< 0.04
Dissolved Organic Carbon	mg/L	1	5		2
Metals and Inorganics					
Sulphate	mg/L	2	500		84
Nitrite (as N)	as N mg/L	0.003		1	<0.003
Nitrate (as N)	as N mg/L	0.006		10	0.072
Nitrate + Nitrite (as N)	as N mg/L	0.006			0.072
Hardness	mg/L as CaCO3	0.05	100		375
Silver	µg/L	0.05			< 0.05
Aluminum	µg/L	1	100		1
Arsenic	µg/L	0.2		10	< 0.2
Barium	µg/L	0.02		1000	70.9
Beryllium	µg/L	0.007			0.012
Bismuth	µg/L	0.01			< 0.01
Boron	µg/L	2		5000	176
Calcium	mg/L	0.01			114
Cadmium	µg/L	0.003		5	< 0.003

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

Sample Number	8
Sample Name	West Pond
Sample Matrix	Ground Water
Sample Date	03/11/2022

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Metals and Inorganics (continued)

Parameter	Units	RL	L1	L2	Result
Cobalt	µg/L	0.004			0.156
Chromium	µg/L	0.08		50	0.24
Copper	µg/L	0.2	1000		2.7
Iron	ug/L	7	300		12
Potassium	mg/L	0.009			3.73
Lithium	µg/L	0.1			20.4
Sodium	mg/L	0.01	200	20	8.50
Magnesium	mg/L	0.001			21.8
Manganese	µg/L	0.01	50		5.45
Molybdenum	µg/L	0.04			0.62
Nickel	µg/L	0.1			< 0.1
Phosphorus	mg/L	0.003			0.015
Lead	µg/L	0.01		10	0.04
Antimony	µg/L	0.6		6	< 0.6
Selenium	µg/L	0.04		50	0.16
Silicon	ug/L	20			3778
Tin	µg/L	0.06			< 0.06
Strontium	µg/L	0.02			5050
Titanium	ug/L	0.05			0.08
Thallium	µg/L	0.005			0.025
Uranium	µg/L	0.002		20	7.55
Vanadium	µg/L	0.01			0.21

Client: Cambium Inc.
Project: 15101-001, Woodview Golf
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Sample Number	8
Sample Name	West Pond
Sample Matrix	Ground Water
Sample Date	03/11/2022

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Tungsten	µg/L	0.02			0.03
Yttrium	µg/L	0.02			0.07
Zinc	µg/L	2	5000		3
Microbiology					
Total Coliform	cfu/100mL	0		0	0
E. Coli	cfu/100mL	0		0	0
Other (ORP)					
pH	No unit	5	8.5		7.93
Chloride	mg/L	1	250		20

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03 L1	ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03 L2
West Pond					
Hardness	SM 3030/EPA 200.8	mg/L as CaCO3	375	100	

QC SUMMARY

QCR_SubCategory

Method: SM 2130 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Turbidity	EWL0130-NOV22	NTU	0.10	< 0.10	0	10	98	90	110	NA		

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0103-NOV22	mg/L as CaCO3	2	< 2	0	20	102	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0072-NOV22	mg/L	0.04	<0.04	ND	10	99	90	110	94	75	125

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO5049-NOV22	mg/L	1	<1	ND	20	106	80	120	106	75	125
Sulphate	DIO5049-NOV22	mg/L	2	<2	ND	20	111	80	120	109	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate + Nitrite (as N)	DIO0233-NOV22	mg/L	0.006	<0.006	NA		NA			NA		
Nitrite (as N)	DIO0233-NOV22	mg/L	0.003	<0.003	5	20	99	90	110	97	75	125
Nitrate (as N)	DIO0233-NOV22	mg/L	0.006	<0.006	2	20	100	90	110	92	75	125

QC SUMMARY

Carbon by SFA

Method: SM 5310 I Internal ref.: ME-CA-[ENV]SFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0076-NOV22	mg/L	1	<1	4	10	100	90	110	93	75	125

Colour

Method: SM 2120 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Colour	EWL0180-NOV22	TCU	3	< 3	ND	10	115	80	120	NA		

Conductivity

Method: SM 2510 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0103-NOV22	uS/cm	2	< 2	0	20	99	90	110	NA		

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver	EMS0048-NOV22	ug/L	0.05	<0.00005	ND	20	102	90	110	106	70	130
Aluminum	EMS0048-NOV22	ug/L	1	<0.001	0	20	102	90	110	115	70	130
Arsenic	EMS0048-NOV22	ug/L	0.2	<0.0002	ND	20	100	90	110	104	70	130
Barium	EMS0048-NOV22	ug/L	0.02	<0.00002	0	20	99	90	110	97	70	130
Beryllium	EMS0048-NOV22	ug/L	0.007	<0.000007	9	20	92	90	110	90	70	130
Boron	EMS0048-NOV22	ug/L	2	<0.002	1	20	99	90	110	99	70	130
Bismuth	EMS0048-NOV22	ug/L	0.01	<0.00001	ND	20	97	90	110	88	70	130
Calcium	EMS0048-NOV22	mg/L	0.01	<0.01	0	20	93	90	110	95	70	130
Cadmium	EMS0048-NOV22	ug/L	0.003	< 0.003	ND	20	100	90	110	99	70	130
Cobalt	EMS0048-NOV22	ug/L	0.004	<0.000004	ND	20	102	90	110	104	70	130
Chromium	EMS0048-NOV22	ug/L	0.08	<0.00008	20	20	102	90	110	107	70	130
Copper	EMS0048-NOV22	ug/L	0.2	<0.0002	0	20	104	90	110	122	70	130
Iron	EMS0048-NOV22	ug/L	7	<0.007	5	20	93	90	110	NV	70	130
Potassium	EMS0048-NOV22	mg/L	0.009	<0.009	0	20	97	90	110	86	70	130
Lithium	EMS0048-NOV22	ug/L	0.1	<0.0001	2	20	94	90	110	91	70	130
Magnesium	EMS0048-NOV22	mg/L	0.001	<0.001	2	20	95	90	110	96	70	130
Manganese	EMS0048-NOV22	ug/L	0.01	<0.00001	1	20	101	90	110	112	70	130
Molybdenum	EMS0048-NOV22	ug/L	0.04	<0.00004	ND	20	103	90	110	105	70	130
Sodium	EMS0048-NOV22	mg/L	0.01	<0.01	1	20	91	90	110	102	70	130
Nickel	EMS0048-NOV22	ug/L	0.1	<0.0001	9	20	94	90	110	100	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Lead	EMS0048-NOV22	ug/L	0.01	<0.00001	0	20	100	90	110	100	70	130
Phosphorus	EMS0048-NOV22	mg/L	0.003	<0.003	2	20	91	90	110	NV	70	130
Antimony	EMS0048-NOV22	ug/L	0.6	<0.0009	ND	20	105	90	110	118	70	130
Selenium	EMS0048-NOV22	ug/L	0.04	<0.00004	ND	20	99	90	110	110	70	130
Silicon	EMS0048-NOV22	ug/L	20	<0.02	2	20	101	90	110	NV	70	130
Tin	EMS0048-NOV22	ug/L	0.06	<0.00006	ND	20	96	90	110	NV	70	130
Strontium	EMS0048-NOV22	ug/L	0.02	0.000114	0	20	100	90	110	101	70	130
Titanium	EMS0048-NOV22	ug/L	0.05	<0.00005	ND	20	97	90	110	NV	70	130
Thallium	EMS0048-NOV22	ug/L	0.005	<0.000005	ND	20	99	90	110	99	70	130
Uranium	EMS0048-NOV22	ug/L	0.002	<0.000002	15	20	101	90	110	100	70	130
Vanadium	EMS0048-NOV22	ug/L	0.01	<0.00001	0	20	102	90	110	103	70	130
Tungsten	EMS0048-NOV22	ug/L	0.02	<0.00002	ND	20	97	90	110	NV	70	130
Yttrium	EMS0048-NOV22	ug/L	0.02	<0.00002	12	20	101	90	110	NV	70	130
Zinc	EMS0048-NOV22	ug/L	2	<0.002	ND	20	105	90	110	122	70	130

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-IENVIMIC-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
E. Coli	BAC9086-NOV22	cfu/100mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9086-NOV22	cfu/100mL	-	ACCEPTED	ACCEPTED							

pH

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
pH	EWL0103-NOV22	No unit	5	NA	0		99			NA		

QC SUMMARY

Solids Analysis

Method: SM 2540C | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0189-NOV22	mg/L	30	<30	0	20	102	90	110	NA		

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 033289 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Kelly Clarkson
Received By (signature): K Clark
Received Date: 11/03/22 (mm/dd/yy)
Received Time: 17:30 (hr : min)
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ICE
Temperature Upon Receipt (°C) 11.11.11
LAB LIMS #: CA14067-NOV22

REPORT INFORMATION	INVOICE INFORMATION
Company: Cambium Inc	☒ (same as Report Information)
Contact: Kevin Warner	Company:
Address: 194 Sophia Street, Peterborough, ON K9H 1E3	Contact:
Phone: 705 742 7900	Address:
Fax:	Phone:
Email: Kevin.Warner@cambiuminc.com	Email:

Quotation #:
P.O. #: 15101-001
Project #: Woodview Golf
Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☒ Regular TAT (5-7days) — TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

***NOTE:** DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☒ ODWS Not Reportable *See note

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M&I: Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN, Hg pH (B(HWS), EC, SAR – soil) (Cl, Na-water)	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M&I: ICP Metals only Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only no BTEX	VOC: VOCs all incl BTEX	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other: See Attached Parameters	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General ☐ Extended ☐	SPLP: Specify tests ☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	TCLP: Specify tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1	West Pond	Nov 3/22	2:10	9	GW	N												X					
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Observations/Comments/Special Instructions

Sampled By (NAME): Warren Young Signature: Warren Young Date: 11/03/22 (mm/dd/yy)
Relinquished by (NAME): Warren Young Signature: Warren Young Date: 11/03/22 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.6
Date of Issue: 02 May 2022

Project: Woodview Golf, Project Number:15101-001 , November 3, 2022

Parameter List

Total Coliform
E. Coli
Alkalinity
pH
Conductivity
Chloride
Nitrite (as N)
Nitrate (as N)
Nitrate + Nitrite (as N)
Sulphate
Colour
Turbidity
Dissolved Organic Carbon
Ammonia+Ammonium (N)
Total Dissolved Solids
Hardness
Silver (total)
Aluminum (total)
Arsenic (total)
Barium (total)
Beryllium (total)
Boron (total)
Bismuth (total)
Calcium (total)
Cadmium (total)
Cobalt (total)
Chromium (total)
Copper (total)
Iron (total)
Potassium (total)
Lithium (total)
Magnesium (total)
Manganese (total)
Molybdenum (total)
Sodium (total)
Nickel (total)
Phosphorus (total)
Lead (total)
Antimony (total)
Selenium (total)
Silicon (total)
Tin (total)
Strontium (total)
Titanium (total)
Thallium (total)
Uranium (total)
Vanadium (total)
Tungsten (total)
Yttrium (total)
Zinc (total)

FINAL REPORT

CA40287-NOV22 R

15101-001 Woodview Golf Subdivision, Woodview ON

Prepared for

Cambium Inc.

FINAL REPORT

CA40287-NOV22 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Cambium Inc.	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	194 Sophia Street Peterborough, ON K9H 1E5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Kevin Warner	Telephone	705-652-2143
Telephone	705-742-7900	Facsimile	705-652-6365
Facsimile		Email	brad.moore@sgs.com
Email	kevin.warner@cambium-inc.com	SGS Reference	CA40287-NOV22
Project	15101-001 Woodview Golf Subdivision, Woodview ON	Received	11/23/2022
Order Number		Approved	12/05/2022
Samples	Ground Water (1)	Report Number	CA40287-NOV22 R
		Date Reported	12/05/2022

COMMENTS

Note: Unionized ammonia calculated using lab results for pH and temperature.

Temperature of Sample upon Receipt: 11 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes
Chain of Custody Number: 030112

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

Client: Cambium Inc.
Project: 15101-001 Woodview Golf Subdivision, Woodview ON
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

Sample Number	6
Sample Name	TW 5
Sample Matrix	Ground Water
Sample Date	23/11/2022

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Alkalinity	mg/L as CaCO3	2	500		351
Colour	TCU	3	5		< 3
Conductivity	uS/cm	2			820
Total Dissolved Solids	mg/L	30	500		494
Turbidity	NTU	0.10	5	1	0.45
Dissolved Organic Carbon	mg/L	1	5		< 1
Ammonia+Ammonium (N)	as N mg/L	0.1			< 0.1
Metals and Inorganics					
Sulphate	mg/L	2	500		13
Nitrite (as N)	as N mg/L	0.03		1	< 0.03
Nitrate (as N)	as N mg/L	0.06		10	0.22
Nitrate + Nitrite (as N)	as N mg/L	0.06			0.22
Hardness	mg/L as CaCO3	0.05	100		38.3
Aluminum (total)	mg/L	0.001	0.1		< 0.001
Antimony (total)	mg/L	0.0009		0.006	< 0.0009
Arsenic (total)	mg/L	0.0002		0.01	< 0.0002
Barium (total)	mg/L	0.00008		1	0.0493
Beryllium (total)	mg/L	0.000007			< 0.000007
Boron (total)	mg/L	0.002		5	0.014
Bismuth (total)	mg/L	0.00001			0.00003
Cadmium (total)	mg/L	0.000003		0.005	< 0.000003
Calcium (total)	mg/L	0.01			11.1

Client: Cambium Inc.
Project: 15101-001 Woodview Golf Subdivision, Woodview ON
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

Sample Number	6
Sample Name	TW 5
Sample Matrix	Ground Water
Sample Date	23/11/2022

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Metals and Inorganics (continued)

Parameter	Units	RL	L1	L2	Result
Chromium (total)	mg/L	0.00008		0.05	< 0.00008
Cobalt (total)	mg/L	0.000004			< 0.000004
Copper (total)	mg/L	0.0002	1		0.0003
Iron (total)	mg/L	0.007	0.3		< 0.007
Lead (total)	mg/L	0.00009		0.01	< 0.00009
Lithium (total)	mg/L	0.0001			0.0004
Magnesium (total)	mg/L	0.001			2.59
Manganese (total)	mg/L	0.00001	0.05		0.00005
Molybdenum (total)	mg/L	0.00004			0.00079
Nickel (total)	mg/L	0.0001			< 0.0001
Phosphorus (total)	mg/L	0.003			< 0.003
Potassium (total)	mg/L	0.009			0.210
Selenium (total)	mg/L	0.00004		0.05	< 0.00004
Silicon (total)	mg/L	0.02			0.55
Silver (total)	mg/L	0.00005			< 0.00005
Sodium (total)	mg/L	0.01			2.67
Strontium (total)	mg/L	0.00008			0.09007
Thallium (total)	mg/L	0.000005			< 0.000005
Tin (total)	mg/L	0.00006			< 0.00006
Titanium (total)	mg/L	0.00005			< 0.00005
Vanadium (total)	mg/L	0.00001			0.00003
Zinc (total)	mg/L	0.002	5		0.002

Client: Cambium Inc.
Project: 15101-001 Woodview Golf Subdivision, Woodview ON
Project Manager: Kevin Warner
Samplers: Warren Young

MATRIX: WATER

Sample Number	6
Sample Name	TW 5
Sample Matrix	Ground Water
Sample Date	23/11/2022

L1 = ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03

L2 = ODWS_MAC / WATER / - - Table 1,2 and 3 - Drinking Water - Reg O.169_03

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Uranium (total)	mg/L	0.000002		0.02	0.000082
Tungsten (total)	mg/L	0.00002			< 0.00002
Yttrium (total)	mg/L	0.00002			< 0.00002
Microbiology					
Total Coliform	cfu/100mL	0		0	0
E. Coli	cfu/100mL	0		0	0
Other (ORP)					
pH	No unit	0.05	8.5		7.87
Chloride	mg/L	1	250		78

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

QC SUMMARY

Alkalinity

Method: SM 2320 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0551-NOV22	mg/L as CaCO3	2	< 2	1	20	104	80	120	NA		

Ammonia by SFA

Method: SM 4500 I Internal ref.: ME-CA-[ENV]SFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0249-NOV22	as N mg/L	0.1	<0.1	ND	10	98	90	110	96	75	125

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO5116-NOV22	mg/L	1	<1	ND	20	105	80	120	114	75	125
Sulphate	DIO5116-NOV22	mg/L	2	<2	ND	20	109	80	120	116	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate + Nitrite (as N)	DIO0633-NOV22	mg/L	0.06	<0.06	NA		NA			NA		
Nitrite (as N)	DIO0633-NOV22	mg/L	0.03	<0.03	ND	20	93	90	110	95	75	125
Nitrate (as N)	DIO0633-NOV22	mg/L	0.06	<0.06	19	20	98	90	110	98	75	125

QC SUMMARY

Carbon by SFA

Method: SM 5310 I Internal ref.: ME-CA-IENVISFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0259-NOV22	mg/L	1	<1	ND	20	101	90	110	116	75	125

Colour

Method: SM 2120 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Colour	EWL0564-NOV22	TCU	3	< 3	ND	10	105	80	120	NA		

Conductivity

Method: SM 2510 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0551-NOV22	uS/cm	2	< 2	1	20	99	90	110	NA		

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0247-NOV22	mg/L	0.00005	<0.00005	ND	20	100	90	110	89	70	130
Aluminum (total)	EMS0247-NOV22	mg/L	0.001	<0.001	NV	20	NV	90	110	93	70	130
Arsenic (total)	EMS0247-NOV22	mg/L	0.0002	<0.0002	ND	20	100	90	110	107	70	130
Barium (total)	EMS0247-NOV22	mg/L	0.00008	<0.00002	4	20	99	90	110	107	70	130
Beryllium (total)	EMS0247-NOV22	mg/L	0.000007	<0.000007	0	20	102	90	110	103	70	130
Boron (total)	EMS0247-NOV22	mg/L	0.002	<0.002	2	20	95	90	110	89	70	130
Bismuth (total)	EMS0247-NOV22	mg/L	0.00001	<0.00001	0	20	97	90	110	94	70	130
Calcium (total)	EMS0247-NOV22	mg/L	0.01	<0.01	18	20	94	90	110	98	70	130
Cadmium (total)	EMS0247-NOV22	mg/L	0.000003	<0.000003	9	20	102	90	110	100	70	130
Cobalt (total)	EMS0247-NOV22	mg/L	0.000004	<0.000004	13	20	98	90	110	103	70	130
Chromium (total)	EMS0247-NOV22	mg/L	0.00008	<0.00008	ND	20	96	90	110	110	70	130
Copper (total)	EMS0247-NOV22	mg/L	0.0002	<0.0002	9	20	99	90	110	121	70	130
Iron (total)	EMS0247-NOV22	mg/L	0.007	<0.007	2	20	102	90	110	111	70	130
Potassium (total)	EMS0247-NOV22	mg/L	0.009	<0.009	10	20	92	90	110	107	70	130
Lithium (total)	EMS0247-NOV22	mg/L	0.0001	<0.0001	8	20	103	90	110	99	70	130
Magnesium (total)	EMS0247-NOV22	mg/L	0.001	<0.001	12	20	102	90	110	105	70	130
Manganese (total)	EMS0247-NOV22	mg/L	0.00001	<0.00001	18	20	101	90	110	118	70	130
Molybdenum (total)	EMS0247-NOV22	mg/L	0.00004	<0.00004	15	20	94	90	110	98	70	130
Sodium (total)	EMS0247-NOV22	mg/L	0.01	<0.01	1	20	92	90	110	100	70	130
Nickel (total)	EMS0247-NOV22	mg/L	0.0001	<0.0001	8	20	95	90	110	106	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Lead (total)	EMS0247-NOV22	mg/L	0.00009	<0.00001	6	20	101	90	110	101	70	130
Phosphorus (total)	EMS0247-NOV22	mg/L	0.003	<0.003	ND	20	93	90	110	NV	70	130
Antimony (total)	EMS0247-NOV22	mg/L	0.0009	<0.0009	ND	20	100	90	110	117	70	130
Selenium (total)	EMS0247-NOV22	mg/L	0.00004	<0.00004	ND	20	95	90	110	103	70	130
Silicon (total)	EMS0247-NOV22	mg/L	0.02	<0.02	5	20	95	90	110	NV	70	130
Tin (total)	EMS0247-NOV22	mg/L	0.00006	<0.00006	3	20	95	90	110	NV	70	130
Strontium (total)	EMS0247-NOV22	mg/L	0.00008	<0.00002	17	20	98	90	110	105	70	130
Titanium (total)	EMS0247-NOV22	mg/L	0.00005	<0.00005	5	20	95	90	110	NV	70	130
Thallium (total)	EMS0247-NOV22	mg/L	0.000005	<0.000005	0	20	99	90	110	96	70	130
Uranium (total)	EMS0247-NOV22	mg/L	0.000002	<0.000002	2	20	100	90	110	98	70	130
Vanadium (total)	EMS0247-NOV22	mg/L	0.00001	<0.00001	7	20	98	90	110	100	70	130
Tungsten (total)	EMS0247-NOV22	mg/L	0.00002	<0.00002	ND	20	96	90	110	NV	70	130
Yttrium (total)	EMS0247-NOV22	mg/L	0.00002	<0.00002	ND	20	98	90	110	NV	70	130
Zinc (total)	EMS0247-NOV22	mg/L	0.002	<0.002	4	20	106	90	110	NV	70	130

QC SUMMARY

Microbiology

Method: OMOE MICROMFDC-E3407A I Internal ref.: ME-CA-IENVIMIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
E. Coli	BAC9418-NOV22	cfu/100mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9418-NOV22	cfu/100mL	-	ACCEPTED	ACCEPTED							

pH

Method: SM 4500 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
pH	EWL0551-NOV22	No unit	0.05	NA	1		100			NA		

QC SUMMARY

Solids Analysis

Method: SM 2540C | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0553-NOV22	mg/L	30	<30	4	20	99	80	120	NA		

Turbidity

Method: SM 2130 | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Turbidity	EWL0545-NOV22	NTU	0.10	< 0.10	0	10	101	90	110	NA		

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 030112
Page 1 of 1

Laboratory Information Section - Lab use only

Received By: natesharu
Received By (signature): natesharu
Received Date: 11 / 23 / 22 (mm/dd/yy)
Received Time: 20 : 10 (hr : min)
Custody Seal Present: Yes [✓] No [ ]
Custody Seal Intact: Yes [✓] No [ ]
Cooling Agent Present: Yes [✓] No [ ] Type: Ice
Temperature Upon Receipt (°C) 11 , 11 , 11
LAB LIMS #: CC140287-NOV 22

REPORT INFORMATION

Company: Cambium Inc
Contact: Kevin Warner
Address: 194 Sophia Street, Peterborough, ON, K9H 1E3
Phone: 705 742 7900
Fax:
Email: Kevin.Warner@cambium-inc.com

INVOICE INFORMATION

[X] (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

Quotation #:
P.O. #:
Project #: 15101-001 Woodview Golf Subdivision
Site Location/ID: Woodview ON

TURNAROUND TIME (TAT) REQUIRED

[X] Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): [ ] 1 Day [ ] 2 Days [ ] 3 Days [ ] 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

[ ] O.Reg 153/04 [ ] O.Reg 406/19
[ ] Table 1 [ ] Res/Park Soil Texture: [ ] Coarse
[ ] Table 2 [ ] Ind/Com [ ] Medium/Fine
[ ] Table 3 [ ] Agri/Other
[ ] Table _____ Appx. _____
Soil Volume [ ] <350m3 [ ] >350m3

Other Regulations:
[ ] Reg 347/558 (3 Day min TAT)
[ ] PWQO [ ] MMER
[ ] CCME [ ] Other:
[ ] MISA
[X] ODWS Not Reportable *See note

Sewer By-Law:
[ ] Sanitary
[ ] Storm
Municipality:

RECORD OF SITE CONDITION (RSC) [ ] YES [ ] NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M&I: Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN,Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na-water)	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs Total [ ] Aroclor [ ]	PHC: F1-F4 + BTEX	PHC: F1-F4 only no BTEX	VOC: VOCs all incl BTEX	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other: See Attached Parameters	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General [ ] Extended [ ]	SPLP: Specify tests [ ] Metals [ ] VOC [ ] 1,4-Dioxane [ ] OCP [ ] ABN	TCLP: Specify tests [ ] M&I [ ] VOC [ ] PCB [ ] B(a)P [ ] ABN [ ] Ignit.	COMMENTS:
1	TW5	Nov 23/22	4:55	9	GW	N												X					
2																							
3																							
4																							
5																							
6																							
7																							
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9																							
10																							
11																							
12																							

Observations/Comments/Special Instructions

Sampled By (NAME): Warren Young
Signature: Warren Young
Date: 11 / 23 / 22 (mm/dd/yy)

Relinquished by (NAME): Warren Young
Signature: Warren Young
Date: 11 / 23 / 22 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.6
Date of Issue: 02 May 2022

Total Coliform
E. Coli
Alkalinity
pH
Conductivity
Chloride
Nitrite (as N)
Nitrate (as N)
Nitrate + Nitrite (as N)
Sulphate
Colour
Turbidity
Dissolved Organic Carbon
Ammonia+Ammonium (N)
Total Dissolved Solids
Hardness
Silver (total)
Aluminum (total)
Arsenic (total)
Barium (total)
Beryllium (total)
Boron (total)
Bismuth (total)
Calcium (total)
Cadmium (total)
Cobalt (total)
Chromium (total)
Copper (total)
Iron (total)
Potassium (total)
Lithium (total)
Magnesium (total)
Manganese (total)
Molybdenum (total)
Sodium (total)
Nickel (total)
Phosphorus (total)
Lead (total)
Antimony (total)
Selenium (total)
Silicon (total)
Tin (total)
Strontium (total)
Titanium (total)
Thallium (total)
Uranium (total)
Vanadium (total)
Tungsten (total)
Yttrium (total)
Zinc (total)

1510-001 analysis parameters list

Nov 8 23/22