

Hydrogeological Investigation & Terrain Analysis Proposed Residential Subdivision Cedar Lakes Subdivision, Phase 3 and 4 Greely, Ontario



Submitted to:

ARK Engineering and Development 2691 Old Highway 17 Rockland, Ontario K4K 1W3

Hydrogeological Investigation & Terrain Analysis Proposed Residential Subdivision Cedar Lakes Subdivision, Phase 3 and 4 Greely, Ontario

> May 2, 2025 GEMTEC Project: 100554.003 - Rev 2

TABLE OF CONTENTS

TABLE OF CONTENTS	II
LIST OF FIGURES (FOLLOWING TEXT OF THE REPORT)	IV
1.0 INTRODUCTION	1
1.1 Objectives of Investigation2.0 REVIEW OF BACKGROUND INFORMATION	
2.1 Land Use and Land Cover 2.1.1 Permit to Take Water Records	
 2.2 Topography and Drainage	3 3 3 3 4 5
 2.6 MECP Water Well Records	. 6 . 6
3.1 Summary of Existing Subsurface Data Paterson (2011-2023) 3.1.1 Soil ConditionsGroundwater Observations	. 7
3.2 Hydrogeological Investigation – GEMTEC4.0 GROUNDWATER SUPPLY	
 4.1 Test Well Construction	13 13 14 14
 4.4 Water Quality	.16 .20 .23 .23 .25
4.5 Test Well Water Quantity	

ii

4.5.1	Pump Test Analysis Overview	
4.5.2	Transmissivity and Storativity Analysis	27
4.6 Hyd	raulic Interference Effects	30
4.6.1	Bedrock Observation Wells	30
4.6.2	Computer Model Simulations	
5.0 HYDRO	DGEOLOGICAL CONCEPTUAL MODEL	32
6.0 IMPAC	T ASSESSMENT	34
6.1 Sev	vage Disposal Systems	34
6.1.1	Class IV Septic Sewage Disposal Systems	34
6.2 Gro	undwater Impacts	35
6.2.1	Hydrogeological Sensitivity	35
6.2.2	Step 1 of 3 - Lot Size Considerations	35
6.2.3	Step 2 of 3 – Isolation	35
6.2.4	Step 3 of 3 - Nitrate Dilution Calculations	
6.2.5	Background Overburden Nitrate Concentrations	38
6.3 Stor	mwater Management Ponds (SWMP)	39
7.0 CONCL	USIONS	40
8.0 RECOM	MMENDATIONS	42
8.1 We	I Construction Recommendations	42
8.2 Wel	I Ownership Recommendations	43
8.3 Site	Phasing and Performance Reviews	44
8.4 Sep	tic System Construction Recommendations	45
-	tic Ownership Recommendations	
•	IRE	
	ENCES	

LIST OF TABLES

Table 2.1 – Summary of Land Use and Land Cover in Study Area	2
Table 2.2 – Summary of Water Well Records Search Results (500-m Radius)	6
Table 3.1 –Groundwater Depth and Elevation (Paterson, 2011, 2023)	7
Table 3.2 –Groundwater Depth and Elevation (GEMTEC)	11
Table 4.1 – Summary of Test Well Construction Details	12
Table 4.2 – Offsite Private Domestic Well Construction Details	13
Table 4.3 – Field Equipment Overview	15
Table 4.4 – Summary of Test Well Certificates of Analysis and Naming Conventions	16
Table 4.5 – Summary of Homeowner Interview	21
Table 4.6 – Summary of ODWQS Exceedances in Private Off-site Wells	22

iii

Table 4.7 – Select Water Quality Results for TW B Supplemental Sampling	23
Table 4.8 – Water Quality Results for On-Site Monitoring Wells	24
Table 4.9 – Water Quality Results for PW-1700 and PW-1738	25
Table 4.10 – Pumping Tests Details	29
Table 5.1 – Framework of Hydrogeological Conceptual Model	33
Table 6.1 – Nitrate Dilution Assumptions	36
Table 6.2 – Nitrate Dilution Calculations	38
Table 6.3 – Overburden Nitrate Sampling	38

LIST OF FIGURES (FOLLOWING THE TEXT OF THE REPORT)

- Figure 1: Test Hole, Private Well, and Test Well Locations
- Figure 1A: Cross Section A-A'
- Figure 1B: Cross Section B-B'
- Figure 2: Topography and Drainage
- Figure 3: OGS Surficial Geology Map
- Figure 4: OGS Overburden Thickness Map
- Figure 5: Well Interference Simulation
- Figure 6: MECP Well Search

LIST OF APPENDICES

- APPENDIX A Storm Drainage and Macro Grading Plan
- APPENDIX B Background MECP Water Well Records
- APPENDIX C Borehole Logs and Soil Characterisation
- APPENDIX D Water Quality Results and Lab Certificates
- APPENDIX E Nitrate Dilution Calculations
- APPENDIX F Pumping Test Graphs and Analysis
- APPENDIX G Long-Term Water Level Monitoring Graphs
- APPENDIX H Well Interference Simulation
- APPENDIX I LSI Calculations
- APPENDIX J Pre-Consultation Summary
- APPENDIX K Conceptual Lot Development Plan

1.0 INTRODUCTION

GEMTEC Consulting Engineers and Scientists (GEMTEC) was retained by ARK Engineering and Development to conduct a hydrogeological investigation and terrain analysis for a proposed 40hectare residential subdivision (hereafter referred to as 'the Site') in Greely, Ontario. The location of the Site is shown in the attached Figure 1.

The Site is about 40 hectares (400,900 m²) in size and is located at 1600 Stagecoach Road, Geographic Township of Osgoode, in the City of Ottawa. The Site is bounded by residential properties utilizing private services to the north and west, Stagecoach Road to the east, and undeveloped woodlands to the south.

The proposed development at the Site will consist of 71 residential lots serviced with on-site septic disposal systems and water supply wells. The proposed lots will be accessed by an internal roadway system and will have a minimum lot size of 0.4 hectares. The proposed layout of the development is shown on the Lot Development Plan (Appendix K). A copy of the proposed Storm Drainage and Macro Grading Plan Cedar Lakes – Phases 3 to 4 prepared by ARK Engineering and Development is provided in Appendix A.

This report is Revision 2 of the initial report dated December 7, 2023. It incorporates additional field work and historical report reviews that were conducted to address comments received by the technical reviewer from the City of Ottawa.

1.1 Objectives of Investigation

The objectives of this investigation are as follows:

- To review available background information to assist in characterization of subsurface conditions in the vicinity of the Site and develop a hydrogeological conceptual model;
- To identify and characterize the shallow subsurface conditions on the Site as they relate to the suitability of on-site septic sewage disposal systems;
- To assess the potential for impact on the receiving aquifer(s) and any nearby surface water features from on-site septic disposal systems;
- To investigate the potential quantity and quality of groundwater available from drilled test wells on the Site for potential domestic supply; and
- To assess the long-term impacts on groundwater supply from existing developments on drilled water supply wells in the vicinity of the Site.

A pre-consultation with the City of Ottawa reviewer Dillon Consulting was held on September 12, 2023. Key points regarding the hydrogeological investigation, terrain and septic impact assessment, and other discussion points were addressed during the pre-consultation meeting. A detailed summary of the pre-consultation provided by Dillon Consulting is included in Appendix J.

1

This investigation did not include a water balance assessment, which is being completed as part of the stormwater management investigations.

2.0 REVIEW OF BACKGROUND INFORMATION

2.1 Land Use and Land Cover

Site land cover is cleared land, unevaluated wetlands and woodlands. Land uses within 500 metres of the Site include vacant undeveloped land, residential properties on private services, agricultural land, and a single commercial property, which is located approximately 400 m from the Site. Specific land use and land cover with respect to the Site boundaries are documented in Table 2.1.

Site Boundary	Existing Land Use and Land Cover
North	Residential dwellings
East	Residential dwellingsPond
West	Residential dwellings
South	Commercial propertyAgricultural landWoodlands

Table 2.1 – Summary of Land Use and Land Cover in Study Area

2.1.1 Permit to Take Water Records

A review of the MECP's Permit to Take Water records (<u>https://www.ontario.ca/page/map-permits-take-water</u>) indicates a large-scale water taking permit registered for the Site. PTTW number 7184-BZ5SAE is listed as dewatering construction with allowable surface and groundwater takings of up to 1,500,000 litres per day. Based on information received from ARK Engineering and Development, the PTTW is associated with construction of the stormwater management ponds for Cedar Lakes Phase 1 and 2, which have been constructed at the time of preparing this report.

2.2 Topography and Drainage

Surface elevation across the Site generally slopes down towards the south (Figure 2), with topography ranging from 101 to 99 metres above mean sea level (m a.s.l.). The existing surficial drainage of the Site is expected to follow topography and is anticipated to be towards the south (Figure 2). Post-development surficial drainage is proposed to be largely directed to the new

stormwater management ponds to the south of the Site, with some being directed north to existing ponds constructed to support the existing Phases 1 and 2 of the development (Appendix A).

2.3 Raisin-South Nation Source Protection

GEMTEC has reviewed the Raisin-South Nation Source Protection Plan (RRSN, 2016). The relevant information is noted:

- The Site is located within an area of highly vulnerable aquifer (HVA) with a vulnerability score of 6. Vulnerability scores range from 0 (least sensitive) to 10 (most sensitive).
 - Most of the Ottawa Region's aquifer system is classified as highly vulnerable.
 - No policy restrictions for the proposed development were identified for HVA zones, based on the source protection plan.
- The Site is within a significant groundwater recharge area.
- The Site is not within an intake protection zone or a wellhead protection area.

2.4 Regional Surficial and Bedrock Geology

Surficial geology maps (Ontario Geologic Survey (OGS), 2010) indicate that the Site is underlain by organic soils (i.e., peat, muck, and/or marl), glacial till (i.e., sandy silt to silty sand), and coarse-textured glaciomarine deposits (i.e., sand and gravel, with minor silt and clay); the OGS mapping of these soils is presented in Figure 3. Soil thickness / bedrock depth mapping (OGS, 2010) indicates the Site is underlain by 1 to 10 metres of soil (Figure 4).

Paleozoic bedrock geology maps (Armstrong and Dodge, 2007) indicate that the bedrock underlying the Site consists of a dolostone unit of the Oxford Formation, which is part of the Beekmantown Group. The Oxford Formation is described as a dolostone with shale and sandstone interbeds that are up to 30 cm thick (Williams, 1991). The formation is characterized by light to medium brownish to greenish grey dolostone.

The Oxford Formation is underlain by the March Formation, which consists of interbedded grey quartz sandstone, dolomitic quartz sandstone, blue-grey sandy dolostone, and dolostone. The March Formation represents a transition zone between the Oxford Formation dolostones above and the Nepean Formation sandstone below. Dolostones of the March Formation are lithologically similar to the overlying Oxford Formation, making them difficult to distinguish using drill cuttings.

Available karst mapping (Brunton and Dodge, 2008) does not indicate any areas of any inferred or potential karstic features.

2.5 **Previous Investigations**

2.5.1 Paterson (2011a) Phase 1 Cedar Lakes

A previous hydrogeological investigation and terrain analysis was completed by Paterson Group Inc. (Paterson). The findings were provided in a report titled "Terrain Analysis and Hydrogeological Study, Proposed Residential Subdivision, Part of Lot 8, Concession 3, Geographic Township of Osgoode, Ottawa (Greely), Ontario" and dated March 16, 2011, in support of the (now existing) Phase 1 of the residential subdivision (shown in Appendix A).

Field investigations were conducted from November 2009 to January 2011. These investigations involved excavating 20 test pits, digging 3 hand auger holes, installing 7 monitoring wells, drilling 5 test wells, background water quality sampling from neighbouring residential wells, test well groundwater pumping tests and water quality sampling, in-situ infiltration testing, soil sample collection and testing, a review of available background documents, and data analysis.

Key project findings from Paterson (2011a) are summarized as follows:

- Phase 1 of Cedar Lakes is underlain by four distinct terrain units established based on a test pit program: clayey silty sand, medium sand with trace silt, gravelly sand, and glacial till, with varying degrees of permeability.
- Water quantity and quality of the Oxford and March Formations (considered to be a combined water supply aquifer) are suitable for domestic use, based on residential well and site test well testing.
 - Test wells were constructed with casing lengths ranging from approximately 8.5 to 18 meters and drilled to depths ranging from 18 to 79 meters.
 - The upper Oxford formation may be vulnerable to surface impacts based on elevated concentrations of nitrate/bacterial indicator species, observed during sampling of residential wells.
- No negative impacts to the bedrock aquifer were anticipated from the residential subdivision based on the septic impact assessment. Patterson inferred that a protective bedrock aquitard overlays the water supply aquifer.
- Elevated concentrations of nitrates were noted in the overburden within the northeast section of Phase 1 Cedar Lakes. The elevated nitrate levels were attributed to areas with relatively flat and slow-moving overburden groundwater with poor drainage. After restoring the drainage pattern within the local area, the overburden groundwater was resampled, and nitrate levels had decreased. The rapid decrease in nitrates were stated to be directly related to the improvement in drainage.
- Well interference between neighbouring wells were expected to be minimal, based on the anticipated water demand being within safe yields of the water supply aquifer.

2.5.2 Paterson (2011b) Phases 2 - 6 Cedar Lakes

A previous hydrogeological investigation and terrain analysis investigation was completed by Paterson. The findings were provided in a report titled "Terrain Analysis and Hydrogeological Study, Proposed Residential Subdivision, Part of Lot 8, Concession 3, Geographic Township of Osgoode, Ottawa (Greely), Ontario" and dated April 1, 2011, in support of Phases 1-6 of a proposed residential subdivision on a 59.04-hectare parcel of land (note that Phases 3-6 are referred to as Phases 3-4 in the GEMTEC report). The previous investigations completed by Paterson (2011a) pertaining to Phase 1 of this development were accounted for in the overall calculations of their investigation.

Field investigations were conducted from November 2009 to January 2011. These investigations involved excavating 28 test pits, digging 3 hand auger holes, installing 8 monitoring wells, drilling five test wells, background water quality sampling from neighbouring residential wells, test well groundwater pumping tests and water quality sampling, in-situ infiltration testing, soil sample collection and testing, review of available background documents, and data analysis.

Key project findings from Paterson (2011b) are summarized as follows:

- Cedar Lakes Phases 2-6 are underlain by overburden more than 4 meters thick, generally consisting of silty sand to sandy silt, which is underlain by lower permeability silty clay, silt or glacial till deposits across the majority of the site. The overburden is underlain by bedrock.
- Water quantity and quality of the Oxford and March Formations (considered to be a combined water supply aquifer) underlying the Site are suitable for domestic use, based on residential well and site test well testing.
 - Test wells were constructed with casing lengths ranging from approximately 8.5 to 18 meters and drilled to depths ranging from 18 to 79 meters.
- No negative impacts to the bedrock aquifer were anticipated from the residential subdivision based on the septic impact assessment. Patterson inferred that a protective bedrock aquitard overlays the water supply aquifer.
- Well interference between neighbouring wells were expected to be minimal, based on the anticipated water demand being within safe yields of the water supply aquifer.

2.5.3 Paterson (2015) Supplemental Study

Paterson prepared a report evaluating the performance of the well and septic services for Phase 1 of the Cedar Lakes Subdivision titled "Hydrogeological Study Performance Report: Servicing Review Study, Proposed Phase 2 Development, Cedar Lakes Subdivision, Ottawa (Greely), Ontario" dated December 8, 2015. Therein, the groundwater quality at two reference locations were compared against baseline conditions before Phase 1 of the development was constructed. In addition, four homeowner wells with casing lengths of approximately 40 metres were sampled and reviewed in the context of the Ontario Drinking Water Quality Standards, Objectives and Guidelines.

2.5.4 Paterson (2023) Phase 3 - 4 Cedar Lakes

The subsurface conditions at the Site were characterized as part of the geotechnical investigation completed by Paterson Group. The findings were provided in a report titled "Geotechnical Investigation, Proposed Residential Development, Cedar Lake Subdivision - Part of Lot 8, Concession 3, Phase 3 & 4, Greely, Ontario" dated October 27, 2023.

The field investigation for the geotechnical investigation included the advancement of seven test pits (TP 1-23 to 7-23, inclusive). The Paterson (2023) report includes the results of previous site investigations completed as part of hydrogeological and geotechnical investigation for Cedar

Lakes Phases 1 through 6. This includes 12 test pits (TP1 to TP12, inclusive) advanced in 2009; eight test pits (MW1 to MW8, inclusive) and four hand auger holes (AH1 to AH4) advanced in 2010, and 17 test pits (TP 13 to TP 29, inclusive) and two hand auger holes (AH5 and AH6) advanced in 2011. A grain size analyses was performed on a sample of glacial till collected from TP 11. The locations of all the test holes referenced in Paterson (2023) are shown on Figure 1.

The subsurface conditions reported by Paterson (2023) for Cedar Lakes Phase 3 and 4 indicate that the site is generally underlain by native deposits of silty sand to sandy silt, overlying glacial till. Occasionally, a layer of clayey silt was identified between the silty sand and glacial till layers.

2.6 MECP Water Well Records

2.6.1 Cedar Lakes Phases 1 and 2 Well Records (North)

A search for the Ministry of Environment, Conservation and Parks (MECP) Water Well Records for existing private wells located in Cedar Lakes Phase 1 and 2 Subdivision, north of the Site was completed.

The well construction details for the Cedar Lakes wells were reviewed and compared to the construction recommendations from the hydrogeological investigation report for the Phase 1 and 2 subdivision application (Paterson, 2011a, 2011b). A total of 52 well records were reviewed from the MECP online water well record database (Appendix B). Based on the well record search, 51 of the 52 available well records indicate casing lengths of at least 40 m, while 1 well record indicated a casing length of 37 m. The hydrogeological investigation report for Phase 1 and 2 (Paterson, 2011a, 2011b) indicates that wells should be constructed with minimum casing lengths of 12 metres below ground surface.

2.6.2 Well Records Within Vicinity of Site (East and West)

A search for the Ministry of Environment, Conservation and Parks (MECP) Water Well Records for existing private wells was completed for private wells within 500 metres of the eastern and west site boundaries (refer to Figure 6).

A total of 38 well records were reviewed from the MECP online water well record mapping resource (Appendix B). Of the 38-drinking water well records reviewed, 21 were completed in limestone bedrock and 17 were completed in limestone and/or sandstone (limestone layers are likely actually dolostone). Table 2.2 provides a summary of the well characteristics for the 38 water well records.

Parameter	10 th Percentile	90 th Percentile	Geometric Mean
Casing Lengths (m)	6.7	18.7	11.7

Table 2.2 – Summary of Water Well Records Search Results (500-m Radius)

6

Parameter	10 th Percentile	90 th Percentile	Geometric Mean
Depth to Bedrock (m)	4.8	17.3	10.6
Total Well Depth (m)	14.6	79.3	39.0
Depth Water Found ¹ (ft)	11.0	63.4	32.5
Recommended Pump Rate (l/min)	18.9	132.5	43.2

Notes:

1. Depth water found as reported on MECP water well records, representing water bearing fractures encountered at the time of drilling.

3.0 TERRAIN EVALUATION

3.1 Summary of Existing Subsurface Data Paterson (2011-2023)

The following subsections provide a summary of the available subsurface data from the Paterson (2011, 2023) reports.

3.1.1 Soil Conditions and Groundwater Observations

Paterson (2011, 2023) observed the depth of exfiltration or groundwater level in test pits and hand auger hole locations at the time of excavation. Their observations are included on the test hole logs included in Appendix C and summarised in Table 3.1.

Table 3.1 – Groundwater Depth and Elevation (Paterson, 2011, 2023)

Test Hole ID	Date	Groundwater Level ¹ (m BGS ²)	Groundwater Elevation (m, CGVD28)
TP 1-23	Oct 4, 2023	1.5	96.9
TP 2-23	Oct 4, 2023	1.0	96.5
TP 3-23	Oct 4, 2023	0.7	97.4
TP 4-23	Oct 4, 2023	Dry to 5.2	Dry to 98.2
TP 5-23	Oct 4, 2023	1.0	97.7

Test Hole ID	Date	Groundwater Level ¹ (m BGS²)	Groundwater Elevation (m, CGVD28)
TP 6-23	Oct 4, 2023	1.0	97.6
TP 6A-23	Oct 4, 2023	1.0	97.7
TP 7-23	Oct 4, 2023	1.0	97.9
TP 7	Nov 24, 2009	1.1	100.3
TP 9	Nov 24, 2009	2.2	98.0
TP 10	Nov 24, 2009	Dry to 2.8	Dry to 100.8
TP 11	Nov 24, 2009	0.35	101.5
TP 12	Nov 24, 2009	1.0	99.5
TP 18	Dec 7, 2010	Dry to 3.1	Dry to 98.9
TP 19	Dec 7, 2010	Dry to 2.6	Dry to 97.4
TP 20	Dec 7, 2010	0.7	97.8
TP 21	Dec 7, 2010	1.6	97.6
TP 22	Dec 7, 2010	1.0	98.4
TP 23	Dec 7, 2010	0.2	98.8
TP 24	Dec 7, 2010	0.7	99.0

8

Test Hole ID	Date	Groundwater Level ¹ (m BGS²)	Groundwater Elevation (m, CGVD28)
TP 25	Dec 7, 2010	0.5	100.7
TP 26	Dec 17, 2010	1.8	97.1
TP 27	Dec 17, 2010	1.5	101.3
AH 1	Oct 4, 2010	2.12	97.0
AH 4	Dec 7, 2010	0.8	97.7
AH 5	Dec 7, 2010	0.8	97.2
MW 1	Sept 22, 2010	1.4	97.6
MW 3	Sept 22, 2010	1.2	98.0
MW 7	Sept 22, 2010	1.4	99.5
MW 8	Nov 24, 2009	0.6	103.1

Notes:

Includes both observations of exfiltration depth in pits following excavation and stable water levels.
 Exfiltration depths would be inclined to, if anything, overestimate the depth of the water table.
 m BGS - Metres Below Ground Surface

Groundwater level varied from 0.2 to more than 3.1 metres below ground surface. Reported elevations of the water table ranged from 103.1 to 97.0 metres above mean sea level, CGVD28. The most concurrent measurements of groundwater levels occurred on December 7, 2010; the water levels at this time suggested that shallow groundwater flow was south.

3.2 Hydrogeological Investigation – GEMTEC

The following subsections provide a summary of the subsurface collected over the course of the current GEMTEC investigation.

3.2.1.1 Field Procedure

The field work for the terrain evaluation was conducted on September 21, 2023. On that date, 3 boreholes (numbered 23-1, 23-2 and 23-3) were advanced on the Site by Limitless Drilling and supervised by GEMTEC. The boreholes were advanced to depths of about 5.5 to 5.9 metres below the existing ground surface. A licensed well technician (from Limitless Drilling) installed well screens at all boreholes locations (i.e., MW23-1, MW23-2, and MW23-3) to allow for groundwater level monitoring and facilitate groundwater quality sampling. The well screens were installed with a surround of filter sand and the annular space was sealed back to surface using bentonite and soil.

Descriptions of the subsurface conditions encountered in the boreholes and well constructions are provided on the borehole logs in Appendix C. The locations of the monitoring wells installed within each borehole are shown on Figure 1. Supplemental permeameter testing and soil characterisation work, as discussed in the technical pre-consultation for the project, were not considered necessary to complete this scope of work and were differed to future field programs.

3.2.1.2 Soil Conditions

The following subsections present an overview of the subsurface conditions encountered in the boreholes advanced as part of the hydrogeological investigation. These findings are reasonably consistent with Paterson, (2023) and the conditions identified on the geological mapping, with the exception of mapped organic soils, which were not encountered.

Silty Sand to Sand

Native deposits of silty sand to sand with some silt, some to trace gravel was encountered below the topsoil in all test hole locations, were encountered at BH23-1 and 23-3. The silty sand to sand deposit extended to depths ranging from about 0 to 3.91 metres below ground surface.

Sandy Silt

A deposit of sandy silt was encountered between the silty sand layer in the BH23-3. The sandy silt layer has a thickness of about 1.53 metres and extends to about 2.9 metres below ground surface.

Clayey Silt

A native deposit of clayey silt was encountered below the sand layers in boreholes 23-1 and 23-2. The clayey silt layer has a thickness ranging from about 0.5 to 2.9 metres and extends to depths ranging from about 2.3 to 5.2 metres below ground surface.

Glacial Till

Glacial till was encountered in all of the boreholes. Glacial till is a heterogeneous mixture of all grain sizes, which at this site, can be described as silty sand to sandy silt, with trace to some gravel and trace silt. Cobbles and boulders are frequently encountered within glacial till. The

glacial till was not fully penetrated in all the test holes but was proven to at least a depth of about 5.9 metres below ground surface.

3.2.1.3 Groundwater Observations

The groundwater levels in the monitoring wells were measured between September and October 2023. The groundwater levels are summarized in Table 3.2 and were all within the overburden.

The groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation. The measured groundwater levels suggest that the overburden groundwater flow is towards the east-southeast, which is generally consistent with topography which slopes to the southeast. Due to the potential divide (high point) in the centre of the site, local flow "catchments" may be more nuanced than the three well assessment has the resolution to conclude. Nonetheless, given the historical data (Paterson, 2011, 2023) and topography, it is reasonable to expect flow to generally travel south and/or southeast.

Well ID	Date of Reading	Rolow Ground Surtaco	
	21-09-2023	1.43	98.9
MW23-1	19-10-2023	1.44	98.9
1010023-1	20-06-2024	2.18	98.1
	14-11-2024	2.38	97.9
	21-09-2023	-0.3 ¹	98.6
MW23-2	19-10-2023	-0.3	98.6
1010023-2	20-06-2024	1.90	
	14-11-2024	2.27	96.1
	21-09-2023	0.61	98.1
	19-10-2023	0.65	97.7
MW23-3	20-06-2024	1.30	97.4
	14-11-2024	2.15	96.5

Table 3.2 – Groundwater Depth and Elevation (GEMTEC)

Note: 1. Artesian conditions

4.0 GROUNDWATER SUPPLY

A groundwater supply investigation was carried out in accordance with the MECP August 1996 document "Procedure D-5-5, Technical Guideline for Private Wells: Water Supply Assessment" and the Ottawa "Hydrogeological and Terrain Analysis Guidelines" dated March 2021 to determine the quantity and quality of groundwater available for domestic water supply. The results of the groundwater supply investigation are summarized in the following sections.

4.1 Test Well Construction

MECP Procedure D-5-5 and the Ottawa "Hydrogeological and Terrain Analysis Guidelines" dated March 2021 indicate that a minimum of five test wells is required for sites more than 25 hectares and up to 40 hectares in area. The total area of the proposed Cedar Lakes Phase 3 – 4 is approximately 40 hectares (40.09 hectares). A total of five test wells (namely TW A (previously TW 1), B, C, D, and E) were utilized to support the groundwater supply investigations.

TW A and C were drilled on the Site as part of previous investigations by others – refer to Paterson (2011b). Conversely, TW B was drilled in 2017 by D&R Well Drilling Inc. and is located off of the Site in a City of Ottawa Park (see Figure 1). The well casings of TW A and TW C were extended with a 4-inch liner during the current groundwater investigation by GEMTEC to meet the recommended 40-metre casing length.TW D and TW E were drilled by Air Rock Drilling Co. Ltd. (Well Contractor License No. 1119) in October 2023. The locations of TW-D and TW-E were chosen to provide representative coverage of the Site and with the intent for future use as water supply wells on individual lots (Figure 1). Copies of the MECP Water Well Records for these wells are provided in Appendix B.

The construction details of TW-A to TW-E inclusive, are summarized in Table 4.1.

Test Well ID	Depth to Bedrock (m BGS ¹)	Depth of Well Casing (m BGS)	Depth Water Found ² (m BGS)	Total Well Depth (m BGS)	Lithology Description (open interval)
TW A (A089354)	11.58	41.1 ³	47.5, 52.4	54.9	Grey and white sandstone
TW B (A209552)	14.48	41.1	59.7	60.6	Grey dolostone
TW C (A093609)	10.67	41.1 ³	49.4, 52.1	54.9	Grey and brown dolostone

Table 4.1 – Summary of Test Well Construction Details



Test Well ID	Depth to Bedrock (m BGS¹)	Depth of Well Casing (m BGS)	Depth Water Found ² (m BGS)	Total Well Depth (m BGS)	Lithology Description (open interval)
TW D (A378947)	6.10	39.9	56.7, 59.1	61.0	Grey and black dolostone with layers of grey sandstone
TW E (A378948)	11.58	41.1	56.1, 59.1	61.0	Grey and black dolostone

Notes:

1. m BGS - Metres Below Ground Surface

2. Depth water found as reported by well driller on the MECP water well record.

3. Test well lined with 4" casing.

4.2 Off-Site Private Well Construction (Wells sampled)

The well construction details of the private wells sampled as part of the hydrogeological investigation are summarized in Table 4.2. The well record for PW-6266 was not found.

Well ID	Well Tag #	Depth to Bedrock (m)	Depth of Well Casing (m)	Depth of Water Found (m)	Total Well Depth (m)	Lithology Description (open interval)
PW-1794	A229133	5.8	39.9	56.7	58.5	Sandstone
PW-1826	A305055	4.9	39.9	52.1, 71.3	73.2	Sandstone
PW-1850	A144728	7.9	39.9	57.3, 77.7, 89.3	91.4	Sandstone
PW-1858	A144727	8.8	39.9	54.9, 75.6, 89.6	91.4	Sandstone
PW-1922	A135456	8.8	39.9	55.2, 77.4	85.3	Sandstone
PW-6266	unknown	unknown	unknown	unknown	unknown	unknown
PW-6342	A014478	9.1	10.7	15.2, 21.0, 22.2	24.4	Limestone (Dolostone)

Table 4.2 – Offsite Private Domestic Well Construction Details

4.3 Pumping Test Field Procedure

The pumping tests for the onsite test wells were conducted between October 25 and November 7, 2023. In each test well a six-hour duration constant discharge rate pumping test was conducted.

The pump discharge was directed to the ground surface at a distance of at least 10 metres from the test wells and in a manner such that the flow of water on the ground surface was directed away from the test wells.

4.3.1 Water Level Measurements and Bedrock Groundwater Flow

During the pumping tests water level measurements were taken at regular intervals in the well being pumped using an electric water level tape and on a continuous basis using electronic data loggers. After the pump was shut off, water level data was collected to ensure a minimum of 95 percent of the drawdown in water level had recovered in the test wells. The water level measurements for the drawdown and recovery data for the pumping tests are provided in Appendix F.

Water level measurements were also taken from other onsite test wells and monitoring wells (observation wells) prior to, during and after the pumping of each of the test wells to determine potential interference effects, water level fluctuations and influence from precipitation. Continuous water level measurements were recorded at 10-minute intervals in all observation wells from October 17, 2023, to November 22, 2023. Water level measurements taken in the observation wells are provided in Appendix G.

Minimal daily water level fluctuations of less than 0.3 metres were observed in all five test wells. Precipitation data from a nearby weather station (Ottawa Int. Airport, approximately 15 km from site) was compared to the test well water levels during the monitoring period. The major rainfall events did not appear to have direct impacts on the test well water levels (Appendix G). A gradual increase in water levels, up to approximately 0.5 metres was observed in all test wells during the four-week water level monitoring period.

4.3.2 Flow Rate Measurements

The wells were pumped using an electric submersible pump and portable generator supplied by Air Rock Drilling Ltd. The flow rate of the pump discharge hose was constantly monitored using a timed-volume method. Multiple flow measurements were taken within the first hour of the pumping test and then at 60-minute intervals throughout the remainder of the pumping test to ensure that the discharge rate maintained a constant flow rate (i.e., within 5%). The test wells were pumped at a rate of approximately 58 litres per minute, which is three times greater than that required to support a 4-bedroom dwelling with flows of 18.8 litres per minute.

4.3.3 Groundwater Sampling

Total chlorine tests were conducted in the field to ensure that chlorine levels were at nondetectable concentrations prior to bacteriological testing. The temperature, conductivity, total dissolved solids, pH, turbidity, colour, and total chlorine levels of the groundwater were measured at periodic intervals during the pumping tests and are summarized in Appendix D. The field



equipment used during the pumping test is calibrated before use and the details of field equipment are provided in Table 4.3.

Table 4.3 – Field Equipment Overview

Field Parameters	Manufacturer	Model No.
Total and Free Chlorine	Hach	DR 900
pH, temperature, Conductivity	Hanna / Horiba¹	HI 98129 / Horiba U-52 ¹
Turbidity	Hanna	HI 98703
Colour	Hach	DR 900

Notes: 1. Rental equipment from Maxim Environmental and Safety Inc.

The groundwater samples were collected after three and six hours of pumping in laboratory supplied bottles and prepared/preserved in the field in accordance with the industry standard sampling, handling and preservation procedures required by the laboratory. The groundwater samples were subsequently submitted to Paracel laboratories in Ottawa, Ontario for analysis of 'subdivision package' and 'trace metals' parameters, as outlined in the City of Ottawa Hydrogeological Guidelines dated March 2021. No other parameters of concern, e.g. volatile organic compounds, were identified based on a review of surrounding land use.

The pre-consultation notes (Appendix J) indicate that radon has been an identified issue in the area and testing of radon is recommended. A technical discussion to discuss radon testing was held on September 20, 2023, between GEMTEC (Andrius Paznekas, M.Sc., P.Geo) and City of Ottawa (Tessa Di Iorio, M.Sc., P.Geo.). It is understood that radon testing has been completed by the OGS and includes 15 samples in the Greely area. The data collected by OGS is not yet publicly available. There are no Ontario Drinking Water Quality Standards or Canadian Guideline limits for radon in groundwater. In Nova Scotia, where radon is more prevalent, Nova Scotia's Environment and Climate change indicates that *"the amount of radon that goes into the air when you use water is so small that it is generally not thought to cause for worry. It usually makes up only 1 to 2% of radon that can collect in indoor air"* (Government of Nova Scotia, N.D). It is understood that one property located south of the Site and outside of Greely is utilizing a radon system; however, the source of radon is unknown. Given the available information, radon in groundwater is not considered to be a parameter of concern that would require testing as part of the Site investigations.



4.4 Water Quality

4.4.1 Test Well Water Quality

A summary of the results from the chemical, physical and bacteriological analyses performed on the water samples obtained from the five test wells and the laboratory results from Paracel are summarized in Appendix D. Table 4.4 summarises how sample identifiers on the certificates of analysis correspond with report test hole identifiers used in this report to clarify variable naming conventions for the test wells.

Paracel Order #	Sample Date	Sample IDs	Report IDs
2344227	Oct 31, 2023	TW1	TWA
2344440	Oct 31, 2023	TW2	TWB
2344186	Oct 30, 2023	TW3	TWC
2343287	Oct 25, 2023	TW4	TWD
2345203	Nov 7, 2023	TW5	TWE

Table 4.4 – Summary of Test Well Certificates of Analysis and Naming Conventions

4.4.1.1 Bacteriological Parameters

Total and free chlorine measurements confirmed that total and free chlorine concentrations in the well water was non-detectable (<0.02 mg/L) at the time of bacteriological sampling during the pumping tests (refer to Appendix D).

Based on water samples collected from the on-site test wells, total coliform counts exceeded the Ontario Drinking Water Quality Standards (ODWQS) maximum acceptable concentration of 0 CFU/100mL in three of the five on-site test wells (TW B, TW C and TW E). Low levels of total coliform were detected in the initial 3-hr samples from TW B, with reported total coliform counts of 1 CFU/100mL, but the 6-hr samples indicated non-detectable total coliform. The total coliform levels detected in the initial 3-hr samples were 14 and 3 CFU/100mL, while the 6-hr samples had concentrations of 8 and 10 CFU/100mL, at TW C and TW E, respectively.

Bacteria indicator species such as *E. coli* and fecal coliform were not detected in any of the water samples.

Test Wells TW C and TW E were shock chlorinated on November 11, 2024, by a licensed well technician (Air Rock Drilling Ltd.). The test wells were allowed for sit for a period of 24-48 hours prior to purging, where the wells were pumped at a rate of approximately 75 litres per minute for about six hours prior to sampling. Test well TW E was pumped on November 12, 2024, and sampled for bacteriological parameters (TC, EC, FC and HPC) following confirmation that the field measured chlorine was non-detectable. All bacteriological parameters analyzed were non-detectable (Laboratory Certificates of Analysis provided in Appendix D).

Test well TW C was pumped on November 13, 2024, and sampled for bacteriological parameters (TC, EC, FC and HPC) following confirmation that the field measured chlorine was nondetectable. The total coliform was reported to be 8 CFU/100mL with non-detectable *E. coli*, fecal coliform and HPC. The pumping equipment / pump trailer was moved from TW E to TW C on November 13, 2024, and is likely the source of total coliform. This is supported by additional well sampling completed on March 25, 2025, where the bacteriological parameters (TC, EC, FC, HPC; duplicate sample) were reported to be non-detectable following purging (Laboratory Certificates of Analysis provided in Appendix D). Test well TW C was not chlorinated between November 11, 2024, and March 25, 2025, when the well was pumped at a rate of approximately 75 litres per minute for six hours prior to sampling.

In GEMTECs professional opinion the detectable total coliform at TW C and TW E was attributable to insufficient well chlorination and/or introduced via pumping equipment.

4.4.1.2 Other Health Related Parameters

With the exception of total coliforms noted above, no maximum acceptable concentration limits of the ODWQS were exceeded in the three and six-hour water samples collected from the onsite test wells.

Sodium concentrations exceeded the warning level for persons on sodium-restricted diets. This exceedance calls for a recommendation that the local Medical Officer of Health be notified in order to alert persons with relevant medical conditions.

4.4.1.3 Operational Guideline Exceedances

Operational related exceedances of the ODWQS were noted for hardness (all test well samples), aluminum (TW A), organic nitrogen (TW B), and are discussed in the following section:

Hardness

The concentration of hardness in water samples obtained from all five test wells ranged from 300 to 469 mg/L, which exceeds the operational guideline of 80 to 100 mg/L of $CaCO_3$ as specified in the ODWQS.

Water having a hardness level above 80 to 100 mg/L as CaCO₃ is often softened for domestic use. The MECP Procedure D-5-5 document states that water having a hardness value more than 300 mg/L is considered "very hard". The Ontario Ministry of the Environment publication entitled "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", states that water with hardness in excess of 500 mg/L is considered to be unacceptable for most domestic purposes. There is no upper treatable limit for hardness specified in MECP Procedure D-5-5.

The concentrations of hardness in all the test wells are below the threshold of 500 mg/L as CaCO3 as specified in the Technical Support Document for the ODWQS. The concentration of hardness observed in the test wells is reasonably treatable using a conventional water softener. Based on our experience, most water supply wells within rural eastern Ontario are equipped with water softeners.

Water softening by conventional sodium ion exchange may introduce relatively high concentrations of sodium into the drinking water that may be of concern to persons on a sodium restricted diet. The use of potassium chloride in the water softener (which adds potassium to the water instead of sodium) could be considered as a means of keeping sodium concentrations in the water at background levels. Consideration could also be given to providing a bypass of the water softener for drinking water purposes (e.g., a bypass of the softener to the cold-water kitchen tap).

Organic Nitrogen

The organic nitrogen concentration (calculated as total Kjeldahl nitrogen – ammonia) slightly exceeded the operational guideline of 0.15 mg/L for ODWQS in the 3-hr and 6-hr samples from test well TW B with concentrations of 0.2 mg/L.

The ODWQS indicates that levels of organic nitrogen more than 0.15 mg/L may be caused by septic tank or sewage effluent contamination and is typically associated with dissolved organic carbon (DOC) contribution, which was reported to be 1.4 mg/L in the 3-hr and 6-hr samples.

Organic nitrogen can react with chlorine and severely reduce its disinfectant power; in addition, taste and odour problems may also occur. It is not expected that ongoing chlorination will be utilized by homeowners in the residential subdivision and, as such, no concerns with the operational objective exceedance for organic nitrogen were identified.

Aluminum

Total aluminum concentrations of 0.135 mg/L identified in the 6-hr samples for TW A slightly exceeds the ODWQS operational guideline of 0.1 mg/L. Aluminum in untreated water is found in the form of fine particles of alumino-silicate clay, which can be effectively removed in coagulation/filtration. The dissolved aluminum concentrations are below the maximum acceptable

concentration of 2.9 mg/L (Health Canada, 2021). The total aluminum exceedances are attributed to the turbidity levels, which was 2.3 mg/L at the time of sampling. This is supported by the dissolved aluminum concentration of 0.019 mg/L which was field filtered through 0.45-micron filter.

The operational guideline exceedance for aluminum was only exceeded in one test well (TW A), which is expected to be within the operational guidelines following additional well development, as the turbidity levels decrease. High levels of aluminum can cause coating of pipes within the distribution system and result in interferences (flocculation, increased pumping energy and interference). Although treatment for aluminum is not anticipated, it can be treated using coagulation/filtration.

4.4.1.4 Aesthetic Objective Exceedances

Aesthetic objective exceedances of the ODWQS included total dissolved solids in TW B and TW D, iron in TW D and TW E, and turbidity in TW E. These exceedances are discussed in the following sections:

Iron

The iron concentrations from all on-site test wells ranged from 0.1 to 0.4 mg/L. The 3-hr samples obtained from TW D, and both the 3-hr and 6-hr samples obtained from TW E exceed the ODWQS aesthetic objective for iron of 0.3 mg/L, with reported iron concentrations of 0.4 mg/L.

Elevated levels of iron may cause staining to plumbing fixtures and laundry. However, the iron level is within the maximum reasonably treatable limits of 5.0 mg/L provided in Table 3 of the Appendix in the MECP Guideline D-5-5. Iron is typically removed using water softeners or manganese greensand filters.

Turbidity

Turbidity levels at TW E slightly exceed the ODWQS aesthetic objective of 5 NTU, with concentrations 5.2 and 5.5 NTU for the 3-hr and 6-hr samples, respectively. It is noted that the 6-hr field measurement for turbidity indicated a concentration of 4.28 NTU, which is within the aesthetic objective.

Discrepancies between lab and field measurements of turbidity can be caused by the change of conditions the water is subjected to during the period between the time of sampling and time of analysis (I.e., change in temperature, oxidation). Precipitation of substances such as iron and manganese can occur, leading to an increase in turbidity. As such, field measured turbidity is considered more representative of in-situ water conditions, which was measured to be 4.28 NTU, satisfying the ODWQS aesthetic objective of 5 NTU.



Total Dissolved Solids (TDS)

TDS levels in samples obtained from TW B and TW D exceed the ODWQS aesthetic objective of 500 mg/L, with concentrations of 916 mg/L and 900 mg/L at TW B, and 562 mg/L and 520 mg/L at TW D, at the 3-hr and 6-hr, respectively. Elevated levels of TDS can lead to problems associated with encrustation and corrosion.

To determine the corrosive nature of the groundwater, the Langelier Saturation Index (LSI) was calculated for the samples obtained from the test wells. These values are based on the laboratory measured TDS, pH, alkalinity, and calcium following 6-hours of pumping. The LSI was calculated for TW B and TW D to be 0.25 and 0.10 respectively, using an estimated groundwater temperature of 10°C (refer to Appendix I). The test wells have LSI values between 0.0 and 0.5, which indicates the groundwater is slightly scale forming and corrosive.

As per the "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", TDS levels in excess of 500 mg/L may result in excessive hardness, taste, mineral deposition or corrosion. According to the "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Total Dissolved Solids (TDS)", published by Health Canada (1991), TDS levels between 600 and 900 mg/L are considered to be 'fair'. At levels above 1,200 mg/L, the palatability of drinking water is 'unacceptable'. The palatability of the drinking water is expected to be acceptable, although some taste problems may occur as the palatability is classified as 'fair'. Optional water treatment by reverse osmosis, distillation, or deionization can reduce TDS concentrations.

4.4.2 Offsite Water Quality Sampling Program

To characterize the background water quality homeowner water quality sampling in the vicinity of the Site was completed. A total of seven private wells were sampled, five of which are located within Cedar Lakes Phases 1 and 2. The remaining two samples were chosen based on their shallower depths and shorter casing lengths to help characterize bedrock aquifer susceptibility to surface contamination. Refer to Figure 1 for the locations of the sampled private wells.

4.4.2.1 Resident Interviews

The participants of the water quality sampling program conducted on November 8, 2023, within Cedar Lakes 1 and 2 were respondents of a general email sent out to homeowners via the Cedar Lakes Homeowners Association. This method gave all homeowners within the subdivision the opportunity to participate in the sampling program. The email yielded five participants.

Further off-site sampling was performed for homes within the adjacent subdivision west of the Site. Following a review of available MECP well records, a door-to-door survey was conducted on November 28, 2023. Two further homeowners agreed to participate in the sampling program, giving a total of seven participants.

A summary of the interviews with the residents is provided in the Table 4.5. Homeowners were requested to rate water quality on a scale of 1 (poor), 2 (fair), 3 (good), 4 (very good), and 5 (excellent).

The private wells owners surveyed had variable water quality ratings, from poor to excellent. Specific water quality comments were for sulfur odours, high iron and colour. Private well owners reported the use of conventional water softeners (7 of 7), UV units (2 of 7), iron filtration (2 of 7) and reverse osmosis (3 of 7). No groundwater quantity issues were reported.

Test Well ID	Homeowner Water Quality Rating¹	Water Quantity Comments	Water Quality / Septic Comments
PW-1922	Excellent	No reported groundwater quantity issues	 No reported groundwater quality issues. UV, Water softener and reverse osmosis (RO) (at sink taps) systems in place.
PW-1826	Good	No reported groundwater quantity issues	Occasional sulfur smell.Water softener system in place.
PW-1858	Fair	No reported groundwater quantity issues	 High iron and sulfur UV, Water softener, iron filter and reverse osmosis (at kitchen tap) systems in place.
PW-1850	Poor	No reported groundwater quantity issues	 Respondent noted no groundwater quality issues. Water softener and iron filtration systems in place.
PW-1794	Poor	No reported groundwater quantity issues	 High iron, hardness, and colour. Reverse osmosis treatment system in place.
PW-6342	Fair	No reported groundwater quantity issues	High iron and sulfurWater softener system in place.

Table 4.5 – Summary of Homeowner Interview



Test Well ID	Homeowner Water Quality Rating ¹	Water Quantity Comments	Water Quality / Septic Comments
PW-6266	Good	No reported groundwater quantity issues	 High iron, and presence of sulfur Water softener system in place.

Colour issues can be the product of metals (e.g., iron and/or manganese) and/or organic materials. Removal of these constituents (e.g., by using softeners and/or reverse osmosis) may improve the colour of the water. Organic materials can result in disinfection bi-products – but regular chlorination of drinking water is not anticipated.

Sulfur smell was reported two homeowners, which may be associated with hydrogen sulphide, which was non-detect in all of the test wells. Sulfide may produce an unpleasant odour/flavour, black stains on laundered items, and black deposits on pipes and fixtures in association with iron. Aeration is an effective treatment option for low levels of hydrogen sulphide.

4.4.2.2 Private Well Water Quality Results

The seven private well water quality results are provided in Appendix D and the ODWQS exceedances are summarized in Table 4.6.

The groundwater encountered in the on-site test wells is similar to the water quality in off-site test wells and private domestic wells, with operational guideline exceedances of hardness and organic nitrogen and aesthetic objective exceedances of iron and total dissolved solids. With the exception of one test well (TW B) which reported a nitrate concentration of 1.6 mg/L, all other wells sampled reported non-detectable (<0.1 mg/L) nitrate concentrations.

ODWQS Exceedance Type	Parameter	Cedar Lakes Phase 1-2	Subdivision West of Site
Health-Related	Total Coliform	-	-
Aesthetic	lron, total dissolved solids	Iron, total dissolved solids	Colour, iron, total dissolved solids
Operation Guideline	Hardness, organic nitrogen, aluminum	Hardness	Hardness, organic nitrogen

Table 4.6 – Summary of ODWQS Exceedances in Private Off-site Wells

4.4.3 Historical Water Quality Data Summary

Water quality data was collected from test wells located in Phase 1 and 2 of the development named TW4 (Phase 1) and TW2A (Phase 2). Samples were collected in 2010 and 2015 and intercompared. To note, TW2A was screened in the (inferred) Oxford Formation in 2010 and extended to the underlying March Formation by the 2015 sample. No exceedances of ODWQS health-related parameters were reported for either well sample. Nitrate (0.32 mg/L) and ammonia (0.05 mg/L) were detected in the Oxford Formation in 2010 in TW2A and some level of organic nitrogen (i.e., the difference between TKN and ammonia) was reported in both wells in 2015. Apart from the noted nitrogen species, the remainder measurements were reported as non-detect.

Water softeners at all private wells tested and some iron filter units in use

4.4.4 Supplemental Sampling Program Results (2024-2025)

Additional sampling was completed to address comments provided from the technical reviewer of the City of Ottawa. The purpose and relevant results of the field and lab water quality sampling is summarised in the following subsections, and the Certificates of Analysis are included in Appendix D following the water quality data reported in previous revisions of the report. Lab analyses were performed by Parcel Laboratories Limited of Ottawa and field parameters were collected using the device summarised in Section 4.3.3.

4.4.4.1 Test Well B (TW B; Off-Site City of Ottawa Park Well)

TWB had detectable nitrate concentrations, despite being cased to 40 metres below ground surface. Accordingly, additional sampling was undertaken to explore this nitrate detection. TWB was re-sampled on November 14, 2024, then again on November 15, 2024, following 1 day of pumping, and a final time on November 28, 2024, following 1 more day of pumping. The first two samples were submitted for chloride and nitrate, as field turbidity readings exceeded 5 NTU at the time of sampling. The third water quality sample was collected after confirmation that turbidity had declined below 5 NTU and was submitted for hardness, total dissolved solids, turbidity, chloride, nitrate, nitrite, calcium, and magnesium. Select water quality results for TWB are summarised in Table 4.7 for consideration.

Date	Nitrate (mg/L)	Nitrite (mg/L)	Chloride (mg/L)	Turbidity (NTU)
14 Nov, 2024	1.2	<0.05	215	-
15 Nov, 2024	1.3	<0.05	214	-

Table 4.7 – Select Water Quality Results for TW B Supplemental Sampling



Date	Nitrate	Nitrite	Chloride	Turbidity
	(mg/L)	(mg/L)	(mg/L)	(NTU)
28 Nov, 2024	1.1	<0.05	212	0.6

4.4.4.2 Test Well C (TW C)

TWC had a total coliform exceedance in a sample taken following the pumping test, believed to be associated with drilling and pumping activities. Confirmatory sampling was performed on November 14, 2024, following chlorination, circulation, and purging of the well. Another low exceedance of total coliform was noted (8 CFU/100 ml of sample). Follow up sampling was performed in duplicate on March 25, 2025. All health-related bacterial indicators were non-detect in both samples. Chlorine was measured at the detection limit (0.02 mg/L), which is inferred to be anomalous given the duration between sampling events, and turbidity in the well (4.4 NTU) was measured below 5 NTU at the time of sampling.

4.4.4.3 Test Well E (TW E)

The initial water quality results for TWE indicated a total coliform exceedance and turbidity in excess of 5 NTU. Accordingly, the well was chlorinated, circulated, and purged. Water samples were collected from TWE on November 12, 2024. The lab reported that the bacterial indicator species were all non-detect and the turbidity was reported as 2.4 NTU. Field turbidity at the time of sampling was measured as 1.9 NTU and chlorine was reported as non-detect (<0.02 mg/L).

4.4.4.4 Monitoring Wells

The on-site monitoring wells (i.e., MW23-01, MW23-02, and MW23-03) were re-sampled on June 20, 2024, and November 14, 2024. Water samples were submitted for nitrogen species, including ammonia, total Kjeldahl nitrogen, nitrate, and nitrite. The water quality results are presented along with previously reported results in Table 4.8.

Well ID	Date (dd/mm/yy)	Nitrate (mg/L)	Nitrite (mg/L)	Ammonia (mg/L)	Total Kjeldahl Nitrogen (mg/L)
	25/09/23	3.4	<0.05	<0.01	0.2
MW23-01	27/10/23	2.6	<0.05	-	-
1010023-01	20/06/24	2.8	<0.05	0.02	0.7
	14/11/24	3.5	0.09	0.03	0.5-

Table 4.8 – Water Quality Results for On-Site Monitoring Wells

Well ID	Date (dd/mm/yy)	Nitrate (mg/L)	Nitrite (mg/L)	Ammonia (mg/L)	Total Kjeldahl Nitrogen (mg/L)
	25/09/23	<0.1	<0.05	0.12	1.6
MW23-02	27/10/23	<0.1	<0.05	-	-
WWV23-U2	20/06/24	<0.1	<0.05	0.16	3.0
	14/11/24	<0.1	<0.05	0.11	1.6
	25/09/23	<0.1	<0.05	0.06	1.3
MW23-03	27/10/23	<0.1	<0.05	-	-
	20/06/24	<0.1	<0.05	0.04	1.0
	14/11/24	<0.1	<0.05	0.01	0.5

4.4.4.5 Homeowner Private Wells

Homeowner wells northeast (PW-1700) and southwest (PW-1738) of TWB were sampled to support an assessment of the observed nitrate concentrations in the deeper aquifer. Samples were collected from both private wells on March 24, 2025, and were submitted for the analysis of chloride and nitrate. The results for both locations are presented in Table 4.9, and the well records for the wells are included at the end of Appendix B.

Table 4.9 – Water Quality Results for PW-1700 and PW-1738

Well ID	Nitrate (mg/L)	Chloride (mg/L)
PW-1700	1.9	235
PW-1738	<0.1	242

4.4.5 Chlorides Assessment

Chloride concentrations range from 6 to 242 mg/L in the 2010 and 2015 samples, which is in general agreement with present investigation (i.e., 61 to 246 mg/L). The large range of chloride concentrations may highlight the variability within the water supply aquifer(s), differences between aquifer units, and/or variable impacts from surface sources (e.g., road salts, softener discharge, septic systems, etc.). This is particularly evident in private wells PW-1850 and PW-1858, which are both completed at depths of 91.4 metres, reported similar water bearing depths of 57.3 / 77.7

/ 89.3 m and 54.9 / 75.6 / 89.6 m respectively, yet the chloride concentrations were 84 and 231 mg/L respectively.

Limited long-term water quality data is available from technically representative test wells to comment on chloride concentrations over time. Additional sampling was performed on the private water supply well at PW-1700, which is a former test well from previous investigation ('HW-TW6'; Paterson 2011b). The chloride concentration of HW-TW6 was reported to be 216 and 209 mg/L during the December 18, 2009, pumping test and 235 mg/L during the homeowner sampling event completed by GEMTEC on March 24, 2025 (Laboratory Certificates of Analysis provided in Appendix D). Recent chloride concentrations are slightly higher than those recorded 15 years ago but remain within the expected range of seasonal variability.

All concentrations remain below the ODWQS aesthetic limit of 250 mg/L.

4.4.6 Nitrogen Species Assessment

TW B presented with low levels of nitrates despite being cased to 40 metres below ground surface, whereas other test wells have non-detectable nitrates. Supplemental groundwater quality sampling was completed at TWB on November 14, 15 and 28, 2024. Test well TWB was pumped for a period of three days, as the field measured turbidity was greater than 5 NTU during the November 14 and 15, 2024 pumping, which is attributed to the well not being regularly pumped. The nitrate concentrations ranged from 1.1 to 1.3 mg/L and the turbidity on November 28, 2024, was 0.6 NTU.

Additional sampling was performed at PW-1700 (upgradient of TW B) and PW-1738 (downgradient of TW B) to investigate potential sources of the nitrate to the deeper groundwater system. PW-1700 was 61.0 m deep and cased down to 15.85 m below ground surface, whereas PW-1738 was 59.1 m deep and cased to 39.9 m below ground surface.

The sample taken from the upgradient location (PW-1700) presented with a higher nitrate concentration (1.9 mg/L) than the concentrations measured in TW B (1.1-1.8 mg/L), whereas the downgradient location was free of measurable concentrations of nitrates. This data suggests that the nitrate source to the deeper groundwater system is localised, rather than a distributed issue across the previous phases of development in the area, and is likely sourced upgradient of TW B. It is presently interpreted that PW-1700, TW B or another upgradient deep well with relatively shallow casing depth, is serving as a vertical connection between the shallow aquifer receiving septic effluent and the deep aquifer. Although a natural vertical fracture connection cannot be entirely ruled out, it is inferred to be less likely considering the conceptual understanding of the Site. Regardless of the transport pathway, this nitrate issue is inferred to be localised, and unlikely to be an issue requiring further investigation for the purpose of the groundwater supply investigation for the Phase 3 and 4 Cedar Lakes developments.

Organic nitrogen increased in both test wells (TW2A and TW4) from 2010 to 2015, but the 2015 concentrations appear to be generally consistent with 2025 water samples. The presence of organic nitrogen could be an indicator of septic influence, but not necessarily, and does not pose a health-related risk in the absence of nitrates and bacteria.

Monitoring wells MW23-1, MW23-2, and MW23-3 were sampled for nitrogen species on four occasions:

- Nitrates at MW23-1 ranged between 2.6 and 3.5 mg/L, likely owing to its proximity to upgradient septic systems and organic deposits previously identified in the area (Paterson, 2010), and nitrates were non-detect at the other two well locations.
- Nitrites were not measurable at any monitoring location.
- Organic nitrogen was present at all locations that are likely associated with surface water processes and/or septic systems in the case of MW23-1.

4.5 Test Well Water Quantity

4.5.1 Pump Test Analysis Overview

As per MECP Procedure D-5-5 and the Ottawa "Hydrogeological and Terrain Analysis Guidelines" dated March 2021, each test well was pumped at a flow rate greater than 18.9 litres per minute for 6 hours.

The maximum drawdown observed at the end of pumping was 5.4 metres in test well TW E which is equivalent to approximately 9.7 percent of the available drawdown in the test well. The drawdown utilized in the remaining test wells ranged from 0.5 to 8.5 percent. All wells recovered within 24 hours following pump turn off time.

Based on these results, all the on-site test wells are capable of supplying water at a rate significantly greater than 18.9 litres per minute for a period greater than six hours. This is considered more than sufficient for typical domestic use.

4.5.2 Transmissivity and Storativity Analysis

The transmissivity of the water supply aquifer was estimated from the pump test drawdown data using Aqtesolv version 4.5, a commercially available software program from HydroSOLVE Inc. Analysis of the pumping test data was carried out using the Cooper-Jacob and Theis recovery methods. The results of the Aqtesolv 4.5 analysis are provided in Appendix F. Storativity values are not generally representative of aquifer properties in single-well pumping tests due to the effects of wellbore storage and/or well construction, and drawdowns were insufficient for analyses of the pumping test using multi-well analyses; therefore, the calculated storativity values were excluded from the results.



4.5.2.1 Pumping Test TW A

Test well TW A was pumped at a constant rate of 57 L/min for 380 minutes. The initial drawdown in the pumped well was approximately 1.2 m within 10 seconds of pumping. It gradually increased to a maximum drawdown of 2.3 m after 380 minutes. The water level in the test well recovered 96 percent approximately 12 minutes after the pump was shut off.

Aquifer parameters were evaluated using drawdown and recovery data from the pumping well. The specific capacity of the well at the time of maximum drawdown was 24.8 L/min/m. An aquifer transmissivity of 86 and 85 m²/day was estimated using the Cooper-Jacob method (drawdown) and Theis method (recovery), respectively.

4.5.2.2 Pumping Test TW B

Test well TW B was pumped at a constant rate of 57 L/min for 380 minutes. The initial drawdown in the pumped well was approximately 0.2 m within 20 seconds of pumping. It gradually increased to a maximum drawdown of 0.3 m after 380 minutes. The water level in the test well recovered 96 percent approximately 16 minutes after the pump was shut off.

Aquifer parameters were evaluated using drawdown data from the pumping well. The specific capacity of the well at the time of maximum drawdown was 190 L/min/m. Aquifer transmissivities of 158 m²/day and 126 m²/day were estimated using the Cooper-Jacob method (drawdown) and Theis method (recovery), respectively.

4.5.2.3 Pumping Test TW C

Test well TW C was pumped at a constant rate of 57 L/min for 381 minutes. The initial drawdown in the pumped well was approximately 1.6 m within 20 seconds of pumping. It gradually increased to a maximum drawdown of 3.1 m after 380 minutes. The water level in the test well recovered 95 percent approximately 24 minutes after the pump was shut off.

Aquifer parameters were evaluated using drawdown data from the pumping well. The specific capacity of the well at the time of maximum drawdown was 18.4 L/min/m. An aquifer transmissivity of 26 m²/day was estimated using both the Cooper-Jacob method (drawdown) and Theis method (recovery), respectively.

4.5.2.4 Pumping Test TW D

Test well TW D was pumped at a constant rate of 57 L/min for 374 minutes. The initial drawdown in the pumped well was approximately 0.9 m within 20 seconds of pumping. It gradually increased to a maximum drawdown of 4.8 m after 374 minutes. The water level in the test well recovered 97 percent approximately 10 minutes after the pump was shut off.

Aquifer parameters were evaluated using drawdown data from the pumping well. The specific capacity of the well at the time of maximum drawdown was 10.6 L/min/m. Aquifer transmissivities

of 90 m²/day, 41 m²/day and 70 m²/day was estimated using the Cooper-Jacob (drawdown), Papadopulos-Cooper method (drawdown) and Theis method (recovery), respectively. The Papadopulous-Copper method was also selected as it incorporates wellbore storage which provided a better estimate of transmissivity. The well response to pumping in TW D was similar to those observed in TW A and TW C. The estimated transmissivity of TW D is within the range of the other test wells and TW D is considered to be technically representative.

4.5.2.5 Pumping Test TW E

Test well TW E was pumped at a constant rate of 57 L/min for 360 minutes. The initial drawdown in the pumped well was approximately 0.9 m within 20 seconds of pumping. It gradually increased to a maximum drawdown of 5.4 m after 360 minutes. The water level in the test well recovered 98 percent approximately within 20 hours of pump shut off.

Aquifer parameters were evaluated using drawdown data from the pumping well. The specific capacity of the well at the time of maximum drawdown was 11.9 L/min/m. Aquifer transmissivities of 13 m²/day and 15 m²/day were estimated using the Cooper-Jacob method (drawdown) and Theis method (recovery), respectively.

The drawdown and recovery water level data from the five pumping tests conducted on the onsite test wells TW A to TW E, inclusive, are provided in Appendix F. The details of the pumping tests carried out on the test wells are provided in Table 4.10.

Parameter	TW A	TW B	тwс	TW D	TW E
Pumping Duration (minutes)	380	380	381	374	360
Flow Rate (litres per minute)	57	57	57	57	57
Static Water Level (m BGS)	5.4	7.0	9.2	4.3	5.3
Well Depth (m BGS)	54.9	60.6	54.9	61.0	61.0
Available Drawdown (m)	49.5	53.6	45.7	56.7	55.8
Water Level at End of Pumping (m BGS)	7.7	7.3	12.3	9.1	10.7
Observed Drawdown at End of Pumping (m)	2.3	0.3	3.1	4.8	5.4

Table 4.10 – Pumping Tests Details

Parameter	TW A	TW B	тwс	TW D	TW E
Percent Drawdown Utilized (%)	4.6	0.5	6.8	8.5	9.7
Recovery hours / % recovered	0.2 / 96%	0.3 / 96%	0.4 / 95%	0.2 / 97%	20 / 98%
Specific Capacity (L/min/m)	24.8	190	18.4	11.9	10.6
Estimated Transmissivity (m²/day)	85	142	26	67	15

4.6 Hydraulic Interference Effects

During the pumping of the onsite test wells, water level measurements were recorded at the remaining four bedrock wells using electric data loggers, recording every 10 minutes. The water level measurements in the observation wells are reported in Appendix G and discussed below.

4.6.1 Bedrock Observation Wells

During the pumping tests for test wells TW A to TW E water levels were measured in bedrock observation wells. The maximum observed water level decrease in bedrock observations wells was 0.15 metres and was observed at TW A during the pumping of TW B. A similar drawdown of 0.12 m was experienced at TW B during pumping of TW A, 0.14 m at TW E during pumping of TW C, 0.12 m and 0.11 m at TW C during pumping of TW D and TW E, respectively. All other wells displayed drawdowns of less than 0.1 m at any given pumping time.

Based on the test well pumping rates (57 litres per minute), which are greater than typical domestic use, little to no hydraulic interference effects are anticipated at the Site. This is supported by long-term water level monitoring of the test wells between October 19 and November 17, 2023. The test wells located on proposed lots adjacent to the existing residential development (Figure 2) did not display any significant (less than 0.5 metres) daily water level fluctuations over the 30-day monitoring period.

4.6.2 Computer Model Simulations

A well interference simulation was developed using Aqtesolv Version 4.5. The well simulation output is provided in Appendix H for reference. Drawdowns were calculated using the Theis (1935) analytical solution for groundwater flow. This mathematical solution is based on the following assumptions:

- The aquifer is homogeneous and isotropic;
- The aquifer is of infinite extent;

- The pumping well is fully penetrating;
- The aquifer is fully confined; and
- The well diameter is negligible.

Like all methods of groundwater modelling, the Theis (1935) solution has several limitations with respect to emulating real-world conditions. Nonetheless, it is still regarded as one of the better tools for efficiently estimating subsurface hydraulic and storage properties using groundwater drawdown, or vise versa. Real aquifers are rarely perfectly confined, homogenous, or isotropic and cannot have a truly infinite extent (though it can be a fair assumption in many circumstances). Furthermore, wellbore storage or screen effects are not incorporated into the Theis (1935) solution.

Storativity in the simulation was not estimated from the pumping test data due to minimal water level drawdowns in the observation wells, as the analysis of single-well pumping tests generally produces inaccurate storativity estimates. Literature values of storativity for confined aquifers, typically range from 5 x 10^{-5} to 5 x 10^{-3} (Todd, 1980), were used in the model in place of values calculated from observational data.

4.6.2.1 Scenario 1

Scenario 1 is provided to illustrate the maximum drawdown using the geometric mean aquifer parameters identified in Table 4.7. The following parameter values were utilized in the model:

•	Number of pumping wells	=	71 wells (well locations approximated by taking the central point on each proposed land parcel).
•	Individual well pumping rate	=	18.75 litres per minute (minimum peak flow estimate as per MECP Procedure D-5-5).
•	Duration of pumping	=	120 minutes.
•	Analysis model	=	Theis
•	Aquifer thickness	=	55 m (minimum aquifer thickness; refer to Table 4.7).
•	Aquifer transmissivity, Theis	=	39 m²/day (geometric mean; refer to Table 4.7).
•	Storativity coefficient	=	5 x 10 ⁻⁵ (conservative estimate based of storativity based on literature values; Todd, 1980).



• Available drawdown = 52 m (geometric mean; refer to Table 4.7).

The results of Scenario 1 simulation indicate that the maximum drawdown within the Site is approximately 6 metres, representing 10% of available drawdown in on-site wells, and is localized to the pumping wells. To note, the long-term water level monitoring of on-site test wells located adjacent to Cedar Lakes Phases 1 and 2 had daily water level fluctuations less than 0.3 metres and therefore, Scenario 1 is considered to be conservative.

Interference between on-site test wells and private wells in Cedar Lakes Phases 1-2 are not anticipated given the wells are constructed with minimum casing depths of 40 metres and the calculated drawdown represents less than 10% of available drawdown.

Private wells located west of the Site are generally shallower, ranging from approximately 14 to 85 metres (10th and 90th percentile) with average well depths of 37 metres. The closest private wells located west of the Site would experience water level drawdown of less than 1.8 metres, assuming the water supply wells are completed in the same aquifer. Given the proposed water supply wells will be cased to 40 metres below ground surface and completed in the March and/or Nepean Formation, shallower wells with smaller available drawdown and completed in the Oxford and/or upper March Formations, would experience less drawdown.

Based on the results of the well interference simulation and on-site water level monitoring, future interference between drinking water wells is estimated to be minimal.

5.0 HYDROGEOLOGICAL CONCEPTUAL MODEL

The framework for the hydrogeological conceptual model for the Site is summarized in Table 5.1. The table shows the hydrogeological model based on thickness of overburden and bedrock layer identified on utilized private wells and on-site test well records. Ground surface elevations for each of the test wells were measured by GEMTEC staff using a Trimble R10 global positioning system, while ground surface elevations for the private wells were estimated from Google Earth.

The hydrogeological model was developed based on well record information for private and test wells, previous site investigations (Paterson, 2011a, 2011b, 2023), GEMTEC monitoring well and test well drilling, and OGS surficial and bedrock geological mapping.

An east-west hydrogeological cross-section (Figure 1A) across the Site was prepared based information from onsite test wells, while a north-south cross section (Figure 1B) was prepared from private wells within approximately 100 m (Figure 1). The boundaries between zones indicated on the cross-section have been interpreted based on available information as have conditions between the investigation points and are illustrative only. The actual conditions may

differ somewhat from that indicated. The elevations are referenced to the Canadian Geodetic Datum of 1928 (CGVD28).

Stratigraphic Unit	Generalized Composition ¹	Thickness (m)
Overburden	Topsoil.SandSilty ClayGlacial Till	• 6.1 to 14.5 metres
Bedrock	 Dolostone and Sandstone (Lower March Formation) Sandstone 	 30 to 55 metres 11 to > 50 metres

Table 5.1 – Framework of Hydrogeological Conceptual Model

Notes:

1. Dolostones may be misidentified as limestone on well records due to similarities.

The overburden water levels measured in three on-site monitoring wells (MW23-1, 23-2 and 23-3) fluctuated up to about 2.5 metres, with slightly artesian conditions observed at MW23-2. Large seasonal fluctuations (i.e., in the order of a few metres) in overburden water levels are anticipated. The highest groundwater levels are expected to occur following the spring freshet and periods of significant rainfall.

The test well bedrock surface elevation ranges from about 89.1 to 94.4 m a.s.l. and the ground elevation at test well locations range from 99.7 to 104.6 m a.s.l. The water found elevations ranged from 42.8 to 55.21 metres below ground surface, and the elevation of the bottom of wells ranged from 38.8 to 49.7 metres below ground surface. The cross-section, based on the on-site test well water well records, indicates that the total thickness of the overburden ranges from approximately 6.1 to 14.5 metres.

The test wells are completed in dolostone and/or sandstone of the lower Oxford, March and/or Nepean Formations. The water well records do not provide sufficient geologic descriptions to delineate between aquifer units. The bedrock supply aquifers are primarily horizontally bedded with primary groundwater flow along the more permeable horizontal layers and bedding planes. Vertical fractures are less connected or cemented and vertical flow is typically orders of magnitude lower than horizontal flow, although vertical flow can locally be higher through faults / fractures and in significant recharge areas. Given the high aquifer transmissivity of the proposed water supply aquifer and relatively low pumping demands for individual private wells, the proposed wells are not likely to induce significant downward gradients.

6.0 IMPACT ASSESSMENT

The impact on groundwater and surface water resources due to wastewater treatment and disposal by individual onsite sewage disposal systems on the Site are assessed in the following sections.

6.1 Sewage Disposal Systems

This section discusses the results of the terrain evaluation as they relate to the feasibility of installing sewage disposal systems on the Site for wastewater treatment and disposal.

It should be noted that the following information is provided for general guidance purposes only and that all septic systems installed on the Site should be designed on a lot-by-lot basis using a lot-specific investigation involving test holes to determine the actual subsurface conditions at the location of the proposed septic system. In all cases, the septic system design must conform to the Ontario Building Code (OBC) requirements.

6.1.1 Class IV Septic Sewage Disposal Systems

This section discusses the results of the terrain evaluation as they relate to the feasibility of installing Class IV septic sewage disposal systems on the Site.

The septic system envelope area (septic envelope) represents the area on a lot set aside for the construction of the leaching bed and is for the leaching bed only. It does not include that area required for the septic tank or the isolation/separation distances required by the Ontario Building Code (OBC). The size of the septic system envelope is a function of the percolation rate of the native soil in the vicinity of the septic envelope (or the fill used for the construction of a septic bed) and the daily effluent loading to the septic bed.

A septic system envelope of 800 m² was adopted for the conceptual lot development plan (Appendix K) to comply with the City of Ottawa official plan. An 800 m² septic envelope corresponds to 20% area cover based on a 4,000 m² (0.4 hectare) lot. The septic system envelope should be readily accommodated on the lot sizes that are proposed. Prior to establishing the actual septic envelope (leaching bed) location on any particular lot, test holes should be excavated to determine the actual subsurface conditions in the area of the proposed leaching bed.

For comparison, Cedar Lakes Phases 1 and 2 has a total of 61 developed lots which have a minimum lot area of 2,000 m² (0.2 hectares) and accommodated well and septic systems.

The septic leaching bed design must ensure that the bottom of the absorption trenches is at least 0.9 metres above low permeability soils (such as silty clay), bedrock, and the seasonally high groundwater table. Based on the groundwater levels measured in test pits and boreholes, it is expected that most of the septic leaching beds at this site will be partially or fully raised.

6.2 Groundwater Impacts

The potential risk to groundwater resources on and off the subject site was assessed in accordance with Ministry of Environment Procedure D-5-4: Technical Guideline for Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment and the Ottawa "Hydrogeological and Terrain Analysis Guidelines" dated March 2021. To evaluate the groundwater impacts, the Three-Step Assessment Process outlining in MECP D-5-4 was followed. These are described below.

6.2.1 Hydrogeological Sensitivity

Areas of thin soil cover, highly permeable soils, and/or fractured bedrock may contribute to hydrogeological sensitivity of a site; these conditions may limit the natural attenuation of constituents entrained in the discharge of on-site septic systems. Areas of thin soil cover, generally taken to be less than 2 m, are not anticipated to be present on site, and permeable sands and topsoil near surface are generally underlain by lower conductivity glacial till or clayey silts. The area is not mapped as an inferred or potential area of karst activity (Brunton & Dodge, 2008). Consequently, the Site is not considered to be hydrogeologically sensitive based on the absence of significant areas of thin soils, highly permeable soils, or karst features.

6.2.2 Step 1 of 3 - Lot Size Considerations

Lot sizes of 1.0 hectares or larger are assumed to be sufficient for attenuative processes to reduce nitrate-nitrogen to acceptable concentrations in groundwater below adjacent properties.

The proposed lot sizes of 0.4 hectares (minimum) do not meet this consideration. Where proposed lot sizes are less than 1.0 hectares the risk of sewage effluent contamination must be assessed for the proposed subdivision, see Step 2.

6.2.3 Step 2 of 3 – Isolation

As per Procedure D-5-4, it is required to:

- Evaluate the most probable groundwater receiver for sewage effluent and
- Define the most probable lower hydraulic or physical boundary of the groundwater receiving the sewage effluent.

Based on the hydrogeological conceptual model and as per the isolation requirements of MECP Procedure D-5-4, the groundwater receiver for the septic effluent is the overburden sands and the glacial till layers.

The result of the hydrogeological conceptual model indicates that the overburden sands and till deposits across the Site generally do not meet the above requirements for isolation. Where it cannot be demonstrated that the effluent is hydrogeologically isolated from the water supply



aquifer and the proposed lot sizes are less than 1.0 hectares, the risk of individual on-site septic systems will be assessed using nitrate-nitrogen contaminant loading, see Step 3.

6.2.4 Step 3 of 3 - Nitrate Dilution Calculations

The maximum allowable concentration of nitrate in the groundwater at the boundaries of a subject property is 10 mg/L as per the Ministry of the Environment and Climate Change's guideline D-5-4, dated August 1996. The nitrate concentration at the boundaries was calculated using the information in Table 6.1.

Table 6.1 – Nitrate Dilution Assumptions

Parameters	Site Descriptions
Infiltration Area for 71 lots	270,885 m ²
Water Holding Capacity	75 mm Sandy Loam (representative of fine sand, silty sand and silty sand glacial till encountered on-site)
Annual Water Surplus ⁽¹⁾	Sandy Loam = 380 mm/year Representative of fine sand, silty sand glacial till encountered on-site
Topography Factor (TF)	0.20 'Rolling lands' with slope between 2.8m to 3.8m/km considered to be representative of post-development topography.
Soil Factor (SF)	0.4 Open Sandy Loam
Cover Factor (CF)	0.165 Rural Lawns 0.15 (70%) and Woodland 0.2 (30%). Weighted average cover factor of 0.165.
Site Average Infiltration Factor ⁽²⁾ (TF + SF + CF)	0.765 Canada Water Surplus Datasheets (Appendix E) for Ottawa

1. Annual water surplus based on Environment Canada Water Surplus Datasheets (Appendix E) for Ottawa International Airport (1939-2020) weather station.

2. Infiltration factors based on information provided in MOEE, 1995.

As presented in Table 6.1 above, assumptions for the nitrate dilution calculations include:

• Water surplus of 380 mm/year and water holding capacity of 75 mm

The geotechnical investigation completed by Paterson (2011a, 2011b, 2023) characterized the surficial soils primarily as native deposits of silty sand to sandy silt underneath the topsoil and/or peat at ground surface. The native sand deposits are consistent with OGS (2010) mapping indicating the site is underlain by coarse-textured glaciomarine deposits (i.e., sand and gravel, with minor silt and clay). Areas of lower permeability soils (i.e. silt, clay and/or glacial till) were encountered

in the southwestern portion of the site (Paterson, 2023); however, these soils were overlain by sandy deposits at least 1 metre thick. Therefore, the upper representative soil type can generally be characterized as a sandy loam, for which a water holding capacity of 75mm and water surplus of 380 mm/year were incorporated into the nitrate impact assessment.

- Infiltration area of 270,885 m²
 - Removal lands previously used in nitrate dilution assessment for Cedar Lakes Phases 1-2 (Paterson, 2011b). Remaining area equal to 308,180 m² based on information provided by the client.
 - Internal roadway area of 15,995 m² (7m wide x 2,285 m length)
 - House and driveway footprint of 300m² per lot. The hard surface area is representative of typical rural-residential house and driveway footprints. It is noted that some residential properties in Cedar Lakes Phases 1-2 have a larger footprint, and the size of future dwellings is unknown at this time. The selection of 300 m² per lot is considered to be appropriate and representative, as it does not consider water directed from roofs and driveways into buried roof leaders (subdivision specification). Following stormwater management guidelines, approximately 50% of water diverted to buried roof leaders can be infiltrated in sandy soils. Thereby, the 300 m² value is suitable, and it does not incorporate the diverted water which would further increase the amount of dilution.
- Stormwater management pond areas (two SWMPs located on southern end of the Site refer to Appendix A) are included in the area available for infiltration. This assumption is based on unlined and naturalized stormwater management ponds. To note, the larger SWMP on the northern portion of the Site is on lands that have been removed from our calculations, as they have been used in previous dilution assessments for Cedar Lakes Phase 2 (Paterson, 2011b).
- Cover factor assumes post-development tree cover of 30% for the Site. The remaining post-development lands will consist of rural lawns (70%) which have a cover factor of 0.15.

The predictive assessment is conducted using a mass balance calculation to determine the sewage loading for nitrate at the property boundary (see equation below).

$$C_{Nitrate} = \frac{Mass}{Volume} = \frac{Annual \, Nitrate \, Loading(grams/year)}{Annual \, Dilution \, Volume(cubic \, metres/year)} = \frac{grams}{cubic \, metre} = \frac{mg}{L}$$

The nitrate dilution calculations are provided in Appendix D and summarized in Table 6.2 below.

Table 6.2 – Nitrate Dilution Calculations

Parameters	Site Descriptions		
Number of Lots	71		
Annual Nitrate Loading	1,036,600 grams/year		
Annual Millate Loading	(71 lots x 40 grams/lot/day *365 days/year)		
	106,137 m³/year		
Annual Dilution Volume	[(surplus 0.380 m/year * infiltration factor 0.765 * infiltration area 270,885 m²-)+ (septic flows of 1 m³/lot/day * 71 lots * 365 days/year)		
Nitrate Concentration at Property Boundary	9.92 mg/L		

Based on the above information, the nitrate concentration at the Site boundary was calculated to be 9.92 mg/L (refer to the calculation in Appendix E). The nitrate impact assessment meets the acceptable nitrate impact requirement of 10 mg/L established by the MECP.

6.2.5 Background Overburden Nitrate Concentrations

Groundwater samples were collected from three on-site monitoring wells completed in the overburden. Groundwater samples were submitted to an accredited laboratory for analysis of nitrate and nitrite. The results are summarized in Table 6.3. The Laboratory Certificates of Analyses are provided in Appendix D.

Monitoring Well ID	Monitoring Well Depth (m)	Sampling Date	Nitrate (mg/L)	Nitrite (mg/L)
		Sep 25/23	3.4	<0.05
MM/22 4	E 4	Oct 27/23	2.6	0.09
MW23-1	5.4	Jun 20/24	2.8	<0.05
		Nov 14/24	3.5	<0.05
		Sep 25/23	<0.10	<0.05
M/M/22 2	MW23-2 5.9	Oct 27/23	<0.10	<0.05
1010023-2		Jun 20/24	<0.10	<0.05
		Nov 14/24	<0.10	<0.05

Monitoring Well ID	Monitoring Well Depth (m)	Sampling Date	Nitrate (mg/L)	Nitrite (mg/L)
		Sep 25/23	<0.10	<0.05
	W23-3 5.9	Oct 27/23	<0.10	<0.05
1010023-3		Jun 20/24	<0.10	<0.05
		Nov 14/24	<0.10	<0.05

Nitrate concentrations were detected in MW23-1 at concentrations ranging from 2.6 to 3.5 mg/L between September 2023 and November 2024. Previous site investigations (Paterson 2011a, 2011b) also reported detectable nitrate concentrations in the eastern portion of Cedar Lakes Phase 2 at concentrations of up to 4.12 mg/L, which were attributed to septic systems and nitrification of peat layers combined with poor drainage. After the peat layers were removed and drainage improved, Paterson (2011b) reported significant decreases in nitrate concentrations to less than 0.53 mg/L (based on three samples from MW6, TP6 and TP7).

The concentrations and location of nitrates are generally consistent with previous investigations, with the highest concentrations localized to the northeastern portion of the site. Shallow overburden groundwater flows are generally to the south, with some local variability expected. Given the dense residential development located north of the site, the detectable nitrate concentration in MW23-1 and northeastern portion of Cedar Lakes Phases 1-2 (Paterson, 2011a, 2011b) are likely from residential septic systems combined with nitrification of peat deposits. The upgradient residential developments have been in place for an extended period of time and the concentrations measured in MW23-1 are lower than those originally reported in Cedar Lakes Phases 1-2 (Paterson, 2011b). Therefore, the nitrate concentrations are considered to be relatively stable and not extending over significant areas of the site.

6.3 Stormwater Management Ponds (SWMP)

The specific design details regarding the construction of the proposed stormwater managements ponds (SWMPs) are not known at this time. It is the intention to retain stormwater on site, and the ponds are expected to be constructed in a manner typical of the many SWMPs already constructed and previously approved by both the City and MECP in the Greely area. The designs will be required to meet the requirements of the Shields Creek Sub watershed study and treatment and volume detention criteria.

No negative impacts to the bedrock water supply aquifer are expected from SWMP constructed in accordance with MECP requirements. The proposed SWMP's are planned to be away from the arterial roadways and as such, there is minimal risk for contamination from agricultural fertilizers (e.g., nitrates), road salts or other sources (e.g., commercial or industrial properties).

7.0 CONCLUSIONS

Based on the results of the hydrogeological investigation, the following conclusions and professional opinions are provided:

- The Site is not considered to be hydrogeologically sensitive based on the absence of significant areas of thin soils, highly permeable soils (i.e. coarse sands or gravels), or karst features.
- The water supply aquifer encountered at the Site includes dolostone of the Oxford and/or March Formations as well as sandstones of the Nepean Formation.
 - The testing depth of on-site test wells ranges from 42 to 61 metres below ground surface.
- Water quality testing indicates that the water quality meets the ODWQS maximum acceptable concentrations and maximum concentrations considered to be reasonably treatable. Groundwater treatment for aesthetic and operational guideline parameters will be required.
 - Variability in groundwater quality was encountered in the five on-site test wells and aesthetic exceedances and treatment options may vary (all exceedances and treatment options discussed below).
 - Off-site private well users reported water quality issues with sulphur odours, hardness, colour and/or metals. Water quality treatment systems reported to include water softeners, iron-filtration, point of use reverse osmosis and/or ultraviolet disinfection.
 - To note, at the end of the six-hour pumping tests total coliform exceeded the ODWQS in TW C and E as well as following re-sampling in TW C; the total coliform is attributed to insufficient well chlorination and/or introduced via pumping equipment. Follow-up sampling confirmed bacteriological parameters were nondetectable. Low levels of total coliforms are not uncommon in newly constructed wells and no private wells sampled reported any bacteriological exceedances.
 - The levels of hardness, iron and manganese are considered to be reasonably treatable using a conventional water softener and/or manganese greensand filter.
 - The ODWQS operational guideline for aluminum was exceeded in one test well and is attributed to the turbidity levels at the time of sampling. The filtered sample collected reported lower aluminum levels within the operational guideline. Extended well development may be required for future wells. Treatment for aluminum is not anticipated; however, if required can be treated using flocculation/filtration.
 - Total Dissolved Solids levels are in excess of 500 mg/L in two of the five test wells, but are considered "fair", according to the "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Total Dissolved Solids (TDS)", published by Health Canada (1991), and are well below levels of 1,200 mg/L, above which

the palatability of drinking water is considered 'unacceptable'. LSI values indicate the water is considered is slightly scale forming and corrosive.

- The water quality from Cedar Lakes Phase 1 and 2 and private domestic wells sampled west of the Site are similar to the water quality found in the proposed subdivision. No significant impacts have been identified from the available background reports and water quality sampling.
- The quantity of groundwater available from the proposed water supply aquifer is more than sufficient for the proposed development and will sustain repeated pumping at the test rate and duration at 24-hour intervals over the long term.
- Interference between drinking water wells is expected to be minimal under typical usage for residential developments.
 - Well interference modelling indicates well interference of up to 4 metres between on-site water supply wells and Cedar Lakes Phase 1-2 wells (10% of available drawdown) and less than 1.8 metres at shallower private wells located west of the Site.
 - Negligible well interference (<0.3 metres) observed in other technically representative test wells during test well pumping tests and long-term test well water level monitoring.
 - Given the high aquifer transmissivity of the proposed water supply aquifer and relatively low pumping demands for individual private wells, the proposed wells are not likely to induce significant downward gradients, which could greater impact existing private well users with shallower wells (particular in the older developments west of the site).
- No negative impacts to the bedrock aquifer are anticipated from the use of on-site septic systems based on nitrate dilution calculations which demonstrate that offsite nitrate impacts are less than 10 mg/L for 71 lots.
 - The development can support up to 71 lots with a calculated nitrate concentration of 9.92 mg/L at the Site boundary.
 - The nitrate dilution calculations assume the stormwater management ponds are unlined and naturalized, a tree planting covenant will be implemented for the proposed development requiring a minimum 30% tree cover.
- No negative impacts to the bedrock aquifer are anticipated from on-site stormwater management ponds constructed in accordance with MECP requirements.
- The observed chloride concentrations, ranging from 61 to 246 mg/L in the present investigation, are consistent with historical data and remain below the Ontario Drinking Water Quality Standards (ODWQS) aesthetic limit of 250 mg/L. The variability in concentrations likely reflects natural heterogeneity within the aquifer system and localized anthropogenic influences. While limited long-term data from test wells restricts definitive trend analysis, recent sampling results, including those from PW-1700, suggest that

chloride levels have remained relatively stable over time and within expected seasonal fluctuations.

- The presence of low-level nitrates in TW B, located off of the Site, contrasted with nondetectable concentrations in nearby test wells, suggests a localized nitrate source likely associated with upgradient influences. Detectable nitrate levels at PW-1700 support the interpretation of a vertical connection, possibly facilitated by shallow casing depths, allowing migration from a septic-impacted shallow aquifer to deeper groundwater. However, the downgradient well (PW-1738) showing no nitrate presence reinforces the localized nature of the issue. Monitoring well data further indicates nitrate influence in specific areas (e.g., MW23-1) consistent with historical septic and organic input, while the absence of nitrites and consistent organic nitrogen concentrations do not suggest a broader health concern. Overall, nitrate presence is considered localized and does not pose a significant risk to the deeper groundwater supply being evaluated for the Phase 3 and 4 Cedar Lakes developments.
- The Conceptual Lot Development Plan (Appendix K) demonstrates that the is sufficient space on the proposed lots to accommodate private well and septic systems along with a residence and driveway.

Based on the results of this hydrogeological investigation and terrain analysis, in GEMTEC's professional opinion that the proposed 71-lot residential development is suitable for development.

8.0 **RECOMMENDATIONS**

The following provides recommendations regarding well construction specifications, water quality and septic systems:

8.1 Well Construction Recommendations

- All wells that are drilled in the subdivision should be constructed in accordance with local and MECP regulations, including, but not limited to, Ontario Reg. 903.
- Well casings should be extended at least 40 metres (131 feet) below ground surface. The entire annular space between the steel casing and the overburden/ bedrock should be filled with a suitable cement or bentonite grout.
- A well grouting certification inspection should be conducted during the installation and grouting of the well casing for all future wells installed on the Site. The well grouting certification inspection should be conducted under the supervision of a professional engineer or professional geoscientist.
- It should be noted that the water bearing fractures in the dolostone and sandstone bedrock were encountered at depths ranging from 47.5 to 59.7 metres below ground surface in test wells TW A to TW E, inclusive. Water quality below 59.7 metres has not been tested.
- Drinking water wells should be located so that they meet and preferably exceed the minimum setback distances from septic systems, property lines and any other sources of

contamination, as required in the Ontario Building Code and/or Ontario Reg. 903. In addition, the well should be situated in a location that allows for future site access for cleaning, treatment, repair, testing or maintenance. Information regarding well access should be included in the subdivision agreement and/or purchase agreement.

- Water supply wells should be located in rear yards as shown in the Lot Development Plan (Appendix K).
- A minimum 3.5 metre side yard setback is recommended to accommodate accessibility for well service rigs.
- A minimum of 15 metres separation (and up to 18 metres for fully raised septic beds) between water wells and septic systems and 15 metres between wells and on-site stormwater management ponds is recommended.
- To reduce the potential for insufficient setbacks between lots, drinking water wells should be in rear yards and septic systems in the front yards, consistent with Cedar Lakes Phase 1 and 2.
- It is recommended that newly drilled water wells be developed by the well driller for a minimum of one hour of pumping following completion of the well drilling. This well development can be carried in conjunction with the one-hour pumping test that is required for the MECP Water Well Record. Extended well development, up to six hours, may be required to reduce turbidity levels to within the ODWQS aesthetic objective.
- It is recommended that newly drilled water wells be chlorinated by the well driller following completion of the well drilling and pumping.
- It should be noted that this study does not address the construction of earth energy systems, which may require approval from the MECP.
- A dedicated monitoring well (one per subdivision phase) is recommended, to be constructed following the casing and total depth recommendation above. The City of Ottawa should be consulted prior to installation as per Official Plan Section 4.7.2 Policy 19.

8.2 Well Ownership Recommendations

- It is recommended that the property owners construct, maintain and test their drinking water well in accordance with the Ministry of the Environment and Climate Change document "Water Supply Wells - Requirements and Best Management Practices, Revised April 2015".
- TW A and TW C were extended using a 4" liner. If those wells are utilised as residential supply wells, then it should be made clear to prospective owners that a well pump that is smaller than standard would be required.
- For all newly drilled wells it is recommended that a raw water sample be collected and analyzed for potability requirements (*E. coli.* and total coliform bacteria).
 - If any bacteriological exceedances of the Ontario Drinking Water Quality Standards (ODWQS) are noted in the sampling, then it is recommended that the homeowner take remedial actions (such as chlorination of the well to eliminate



bacteria) and retest a raw water sample to confirm that the remedial actions were effective.

- It is recommended that homeowners be informed that some wells may exhibit elevated aesthetic parameters (hardness, iron, total dissolved solids, and organic nitrogen) and incrustation, taste, odour (hydrogen sulphide), and colour can be expected.
 - Several private well owner report using water softeners, UV units, iron filtration, and/or reverse osmosis to improve the quality of their groundwater (noting that UV units would not likely be suitable/necessary for wells cased 40+ m).
 - Organic nitrogen compounds frequently contain amine groups which can react with chlorine and severely reduce its disinfectant power.
 - Iron is typically removed using water softeners or manganese greensand filters.
- It is recommended that homeowners be informed that hardness levels may exceed the ODWQS operational guideline for hardness. Conventional water softeners may be desired by homeowners to treat minor aesthetic objective and operational guideline exceedances of the ODWQS such as hardness. On heating, hard water has a tendency to form scale deposits and can form excessive scum with regular soaps. Conversely, soft water may result in accelerated corrosion of water pipes.
- It is recommended that homeowners and the Local Medical Officer of Health be informed that sodium concentrations exceed 20 mg/L and exceed the warning level for persons on sodium restricted diets.
- It is recommended that homeowners be informed that water softening by conventional sodium ion exchange may introduce relatively high concentrations of sodium into the drinking water which may be of concern to persons on a sodium restricted diet. The use of potassium chloride in the water softener (which adds potassium to the water instead of sodium) could be considered as a means of keeping sodium concentrations in the water at background levels. Consideration could also be given to providing a bypass of the water softener for drinking water purposes.

8.3 Site Phasing and Performance Reviews

- Performance reviews (also referred to as Supplemental Studies) should be conducted in accordance with MECP Procedure D-5-5 Private Wells: Water Supply Assessment, section 4.7 Phased Developments and the Ottawa "Hydrogeological and Terrain Analysis Guidelines" dated March 2021.
- The results of the proposed performance evaluation would be reported prior to the registration of the subsequent phases. The report would include the MECP Water Well Records for the private wells sampled and a site plan showing the sampled well locations as well as any other wells drilled in the subdivision.
 - The proposed Site Phasing includes 40 residential lots in Phase 3 and the remaining 31 lots in Phase 4.



 In accordance with the MECP guideline D-5-5, the recommendations and requirements provided in the hydrogeological report and terrain evaluation will be assessed and updated, if required, based on the findings of the investigations for the performance reports and/or a change in the surrounding land use.

8.4 Septic System Construction Recommendations

- To reduce the potential for insufficient setbacks between lots, septic systems should be in front yards of each lot – refer to Lot Development Plan in Appendix K for proposed septic system locations.
- A maximum of 71 lots (septic systems) are recommended for the proposed subdivision based on the septic impact assessment (Section 6.2).
- The proposed lots will be serviced by conventional septic sewage disposal systems designed according to the Ontario Building Code. A site-specific investigation should be conducted on each lot for the design of the septic system.
 - Due to the presence of shallow groundwater, septic beds will likely be partially or fully raised.
- Tertiary septic systems could be considered for the proposed development and/or individual property owners. Any tertiary systems should be designed according to the Ontario Building Code. A site-specific investigation should be conducted on each lot for the design of the septic system.
 - It is recommended that if property owners choose to install tertiary treatment septic systems, then it will be required to enter a maintenance agreement with authorized agents of the system manufacturer for the service life of the system.

8.5 Septic Ownership Recommendations

 It is recommended that the property owners construct, maintain and check their onsite septic system in accordance with the Ontario Building Code and best management practices (Ministry of Municipal Affairs and Housing, 2021). The owner shall consult the following guides available at: <u>https://www.oowa.org/homeowner-resources/</u>.

9.0 CLOSURE

We trust that this report is sufficient for your requirements. If you have any questions concerning this information or if we can be of further assistance to you on this project, please call.

Samuel Esenwa, G.I.T. Environmental Scientist



wokas

Andrius Paznekas, M.Sc., P.Geo. Hydrogeologist

SE/DC/JKA/AP



10.0 REFERENCES

Armstrong, D.K. and Dodge, J.E.P. 2007. Paleozoic geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 219

Brunton, F.R. and Dodge, J.E.P. 2008. Karst of southern Ontario and Manitoulin Island; Ontario Geological Survey, Groundwater Resources Study 5.

Cuddy, S., Chan, G.S., and Post, R. 2013. Hydrogeological Assessment Submissions, Conservation Authority Guidelines for Development Applications. Lake Simcoe Region Conservation Authority.

Gao, C., Shirota, J., Kelly, R.I., Brunton, F.R. and van Haaften, S. 2006. Bedrock topography and overburden thickness mapping, southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 207.

Health Canada. 2021. Guidelines for Canadian Drinking Water Quality, Guideline Technical Document, Aluminum. March, 2021.

Ministry of Environment, Conservation and Parks. 2011. Soil, Ground Water and Sediment Standards for Use Under XV.1. of the Environmental Protection Act. PIBS # 7382e01 dated April 15, 2011.

Ontario Geological Survey. 2010. Surficial geology of Southern Ontario. Ontario Geological Survey, Miscellaneous Release-Data 128-Revision 1.

Ontario Geological Survey. 2011. 1:250 000 scale bedrock geology of Ontario. Ontario Geological Survey, Miscellaneous Release-Data 126-Revision 1.

Ontario Ministry of Municipal Affairs and Housing, Building and Development Branch. 2006. Building Code Compendium. December 31, 2006.

Ontario Ministry of Environmental, Conservation and Parks. 1982. Manual of Policy, Procedures and Guidelines for Private Sewage Disposal Systems. May 1982.

Ontario Ministry of Environmental, Conservation and Parks. 1996. Procedure D-5-5, Technical Guideline for Private Wells: Water Supply Assessment. August 1996.

Ontario Ministry of Environmental, Conservation and Parks. 1996. Procedure D-5-4, Technical Guideline for Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment. August 1996.

Ontario Ministry of Environmental, Conservation and Parks. 2008. Ontario Drinking Water Quality Standards, Safe Drinking Water Act, 2002, Ontario Regulation 169/03 as amended by Ontario Regulation 327/08.

Ontario Ministry of Environmental, Conservation and Parks. 2006. Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines. June 2006.

Ontario Ministry of Environmental, Conservation and Parks. 1995. MOEE Hydrogeological Technical Requirements for Land Development Applications. April 1995.

Paterson Group. 2011a. Terrain Analysis and Hydrogeological Study, Proposed Residential Subdivision, Part of Lot 8, Concession 3, Geographic Township of Osgoode, Ottawa (Greely), Ontario. April 1, 2011.

Paterson Group. 2011b. Terrain Analysis and Hydrogeological Study, Proposed Residential Subdivision, Part of Lot 8, Concession 3, Geographic Township of Osgoode, Ottawa (Greely), Ontario. May 7, 2010, Updated October 12, 2010, Current Version May 16, 2011.

Paterson Group. 2023. Geotechnical Investigation, Proposed Residential Subdivision, Cedar Lake Subdivision-Part of Lot 8, Concession 3, Phase 3 & 4, Greely, Ontario. October 27, 2023.

Raisin Region Conservation Authority and South Nation Conservation (RRSN). 2016. Source Protection Plan, Raison-South Nation Source Protection Region. Retrieved from https://yourdrinkingwater.ca/files/source-protection-plan/Plan-1-4-0-Complete.pdf

Todd, D.K., 1980. Groundwater Hydrology, 2nd ed., John Wiley & Sons, New York, 535p.

Williams, D.A. 1991. Paleozoic Geology of the Ottawa-St. Lawrence Lowland, Southern Ontario; Ontario Geological Survey, Open File Report 5770, 292p.

Government of Nova Scotia. N.D. Radon in Nova Scotia's Drinking Water. Retrieved from https://novascotia.ca/nse/water/radon.asp#:~:text=The%20amount%20of%20radon%20that,f or%20radon%20in%20drinking%20water





CONDITIONS AND LIMITATIONS OF THIS REPORT

- 1. **Standard of Care:** GEMTEC has prepared this report in a manner consistent with generally accepted engineering or environmental consulting practice in the jurisdiction in which the services are provided at the time of the report. No other warranty, expressed or implied is made.
- 2. Copyright: The contents of this report are subject to copyright owned by GEMTEC, save to the extent that copyright has been legally assigned by us to another party or is used by GEMTEC under license. To the extent that GEMTEC owns the copyright in this report, it may not be copied without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to the Client in confidence and must not be disclosed or copied to third parties without the prior written agreement of GEMTEC. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests.
- 3. Complete Report: This report is of a summary nature and is not intended to stand alone without reference to the instructions given to GEMTEC by the Client, communications between GEMTEC and the Client and to any other reports prepared by GEMTEC for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. GEMTEC cannot be responsible for use of portions of the report without reference to the entire report.
- 4. Basis of Report: This Report has been prepared for the specific site, development, design objectives and purposes that were described to GEMTEC by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document, subject to the limitations provided herein, are only valid to the extent that this report expressly addresses the proposed development, design objectives and purposes. Any change of site conditions, purpose or development plans may alter the validity of the report and GEMTEC cannot be responsible for use of this report, or portions thereof, unless GEMTEC is requested to review any changes and, if necessary, revise the report.
- 5. **Time Dependence:** If the proposed project is not undertaken by the Client within 18 months following the issuance of this report, or within the timeframe understood by GEMTEC to be contemplated by the Client, the guidance and recommendations within the report should not be considered valid unless reviewed and amended or validated by GEMTEC in writing.
- 6. Use of This Report: The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without GEMTEC's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, GEMTEC may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process.

Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.

- 7. **No Legal Representations:** GEMTEC makes no representations whatsoever concerning the legal significance of its findings, or as to other legal matters touched on in this report, including but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.
- 8. **Decrease in Property Value:** GEMTEC shall not be responsible for any decrease, real or perceived, of the property or site's value or failure to complete a transaction, as a consequence of the information contained in this report.
- 9. Reliance on Provided Information: The evaluation and conclusions contained in this report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations. information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of misstatements, omissions,



misrepresentations. or fraudulent acts of the Client or other persons providing information relied on by us. We are entitled to rely on such representations, information and instructions and are not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

10. **Investigation Limitations:** Site investigation programs are a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions but even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions.

The data derived from the site investigation program and subsequent laboratory testing are interpreted by trained personnel and extrapolated across the site to form an inferred geological representation and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Conditions between and beyond the borehole/test hole locations may differ from those encountered at the borehole/test hole locations and the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. Accordingly, GEMTEC does not warrant or guarantee the exactness of of the subsurface descriptions.

Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities (traffic, excavation, groundwater level lowering, pile driving, blasting, etc.) on the site or on adjacent sites. Excavation may expose the soils to changes due to wetting, drying or frost. Unless otherwise indicated the soil must be protected from these changes during construction.

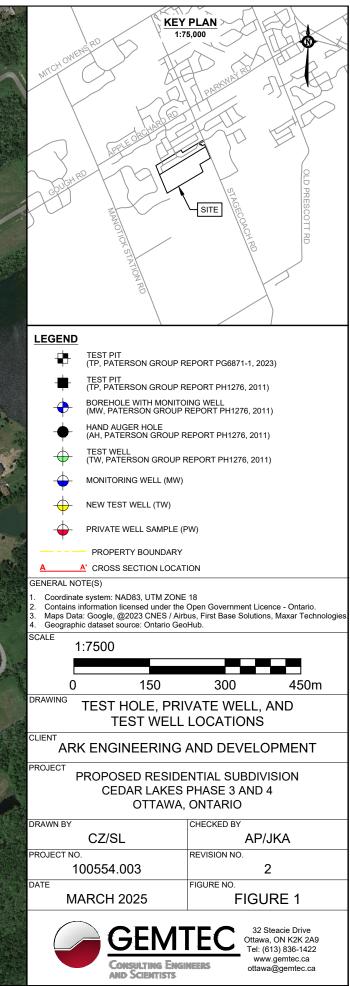
In addition, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.

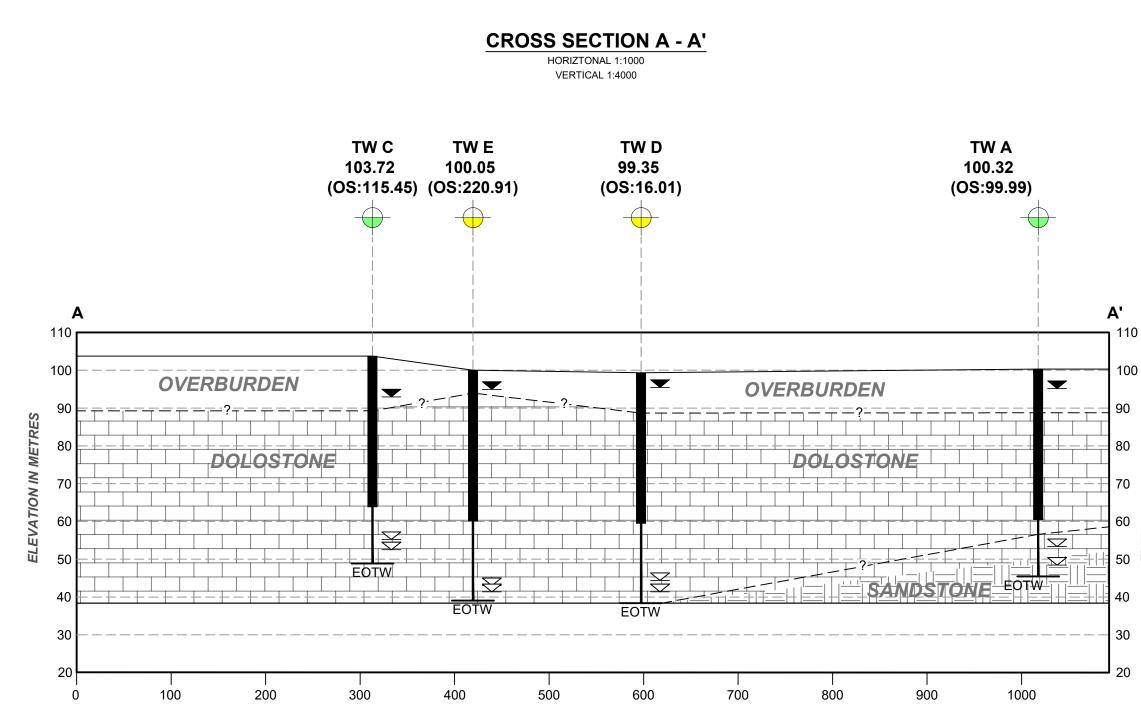
- 11. **Sample Disposal:** GEMTEC will dispose of all uncontaminated soil and/or rock samples 60 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fill materials or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.
- 12. **Follow-Up and Construction Services:** All details of the design were not known at the time of submission of GEMTEC's report. GEMTEC should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of GEMTEC's report.

During construction, GEMTEC should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not materially differ from those interpreted conditions considered in the preparation of GEMTEC's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in GEMTEC's report. Adequate field review, observation and testing during construction are necessary for GEMTEC to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, GEMTEC's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

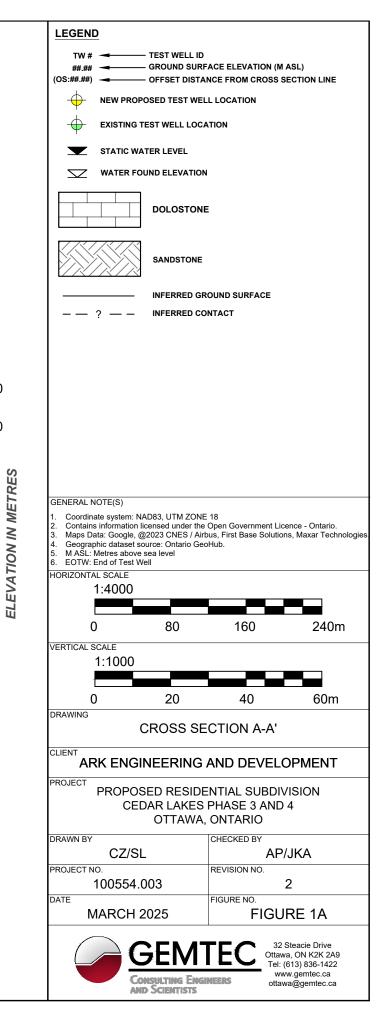
- 13. **Changed Conditions:** Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that GEMTEC be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that GEMTEC be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.
- 14. **Drainage:** Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. GEMTEC takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.



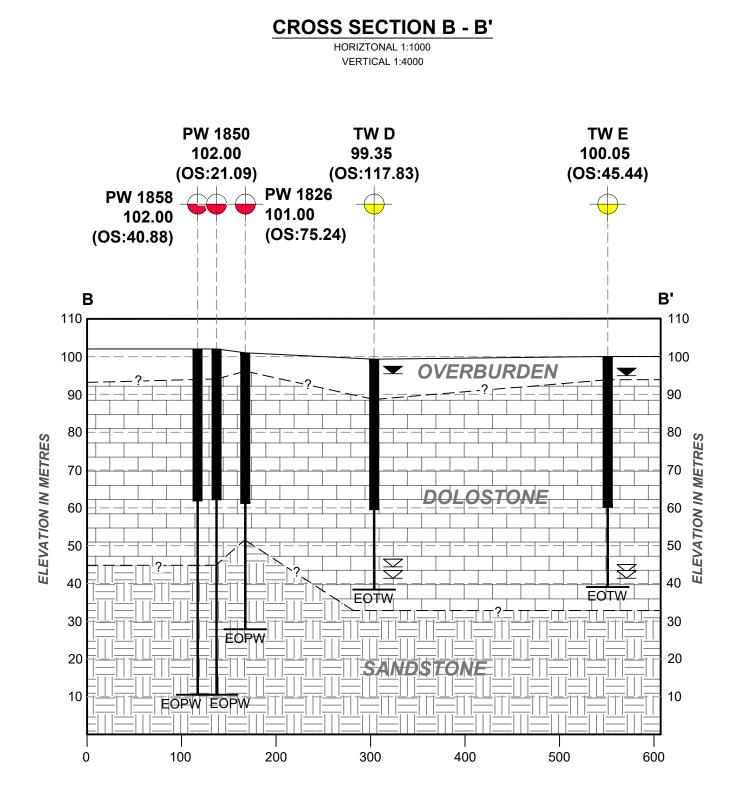




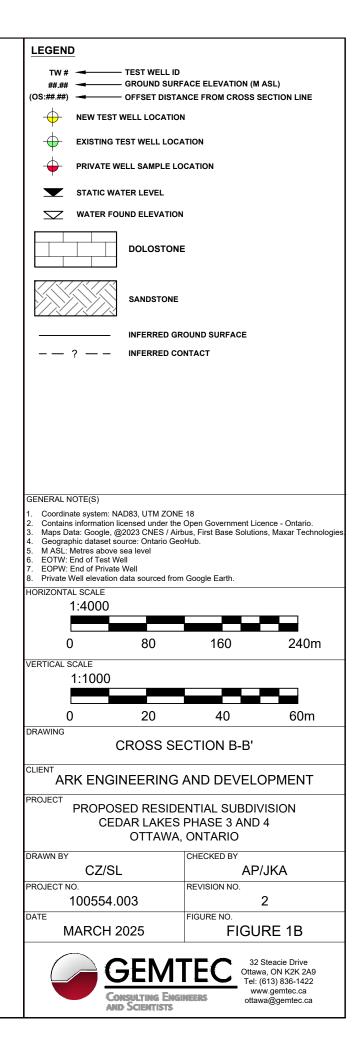
DISTANCE IN METRES

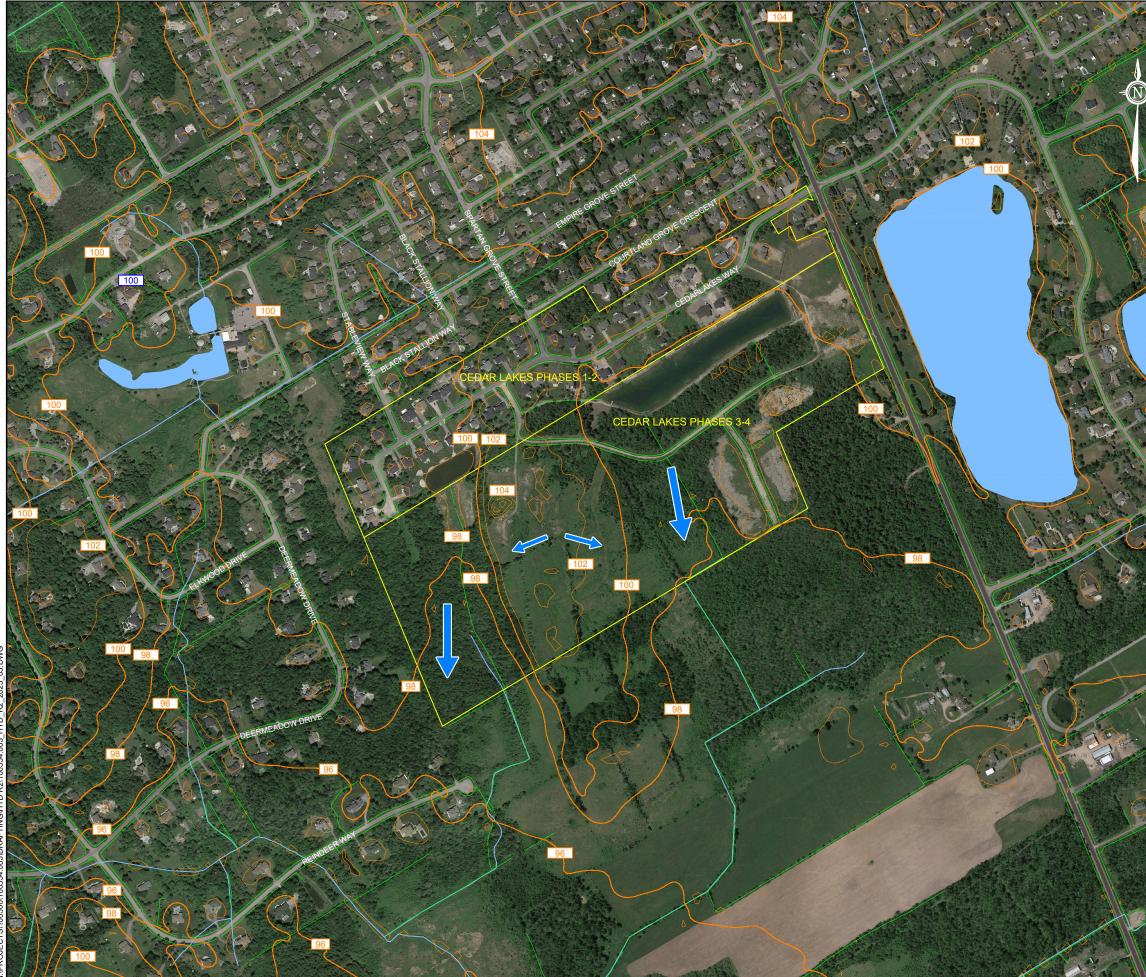


70 50 🖬



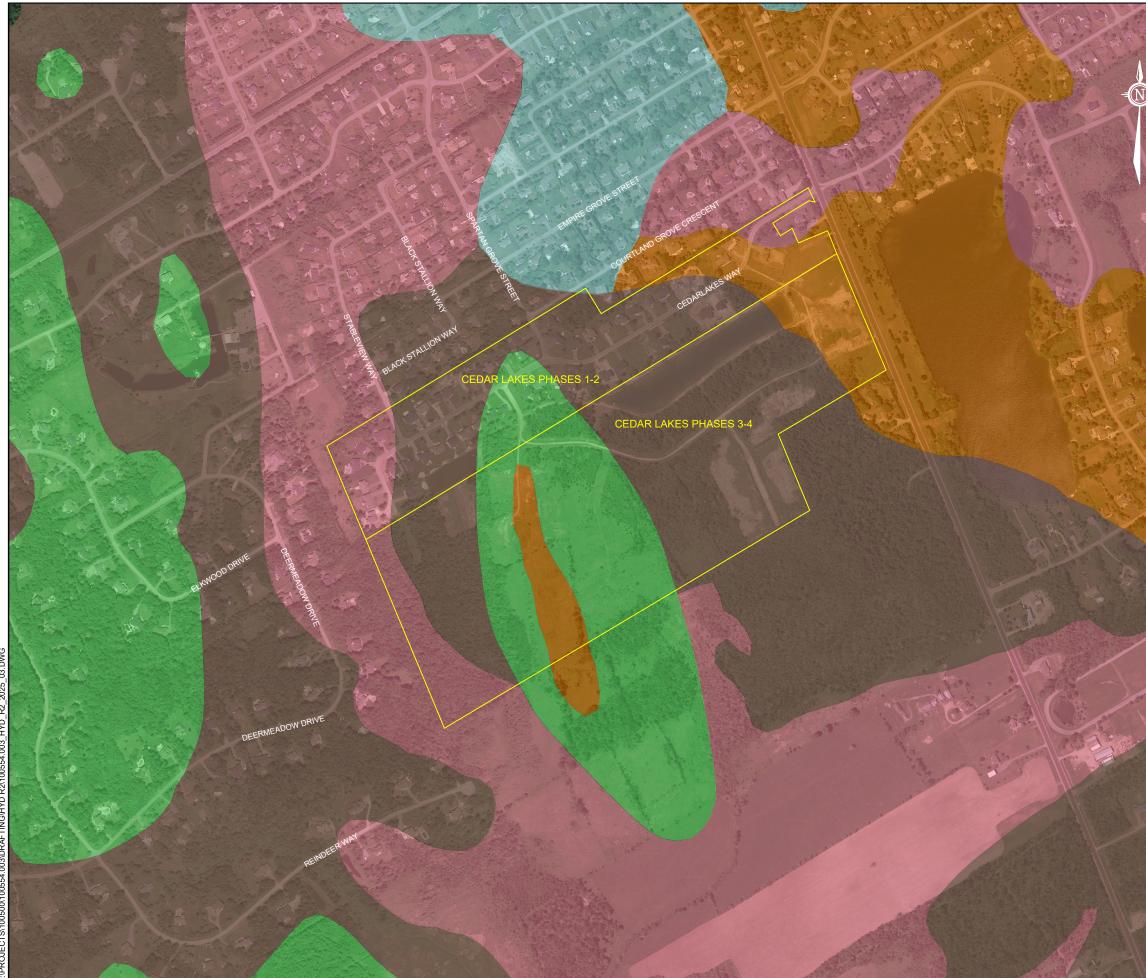
DISTANCE IN METRES





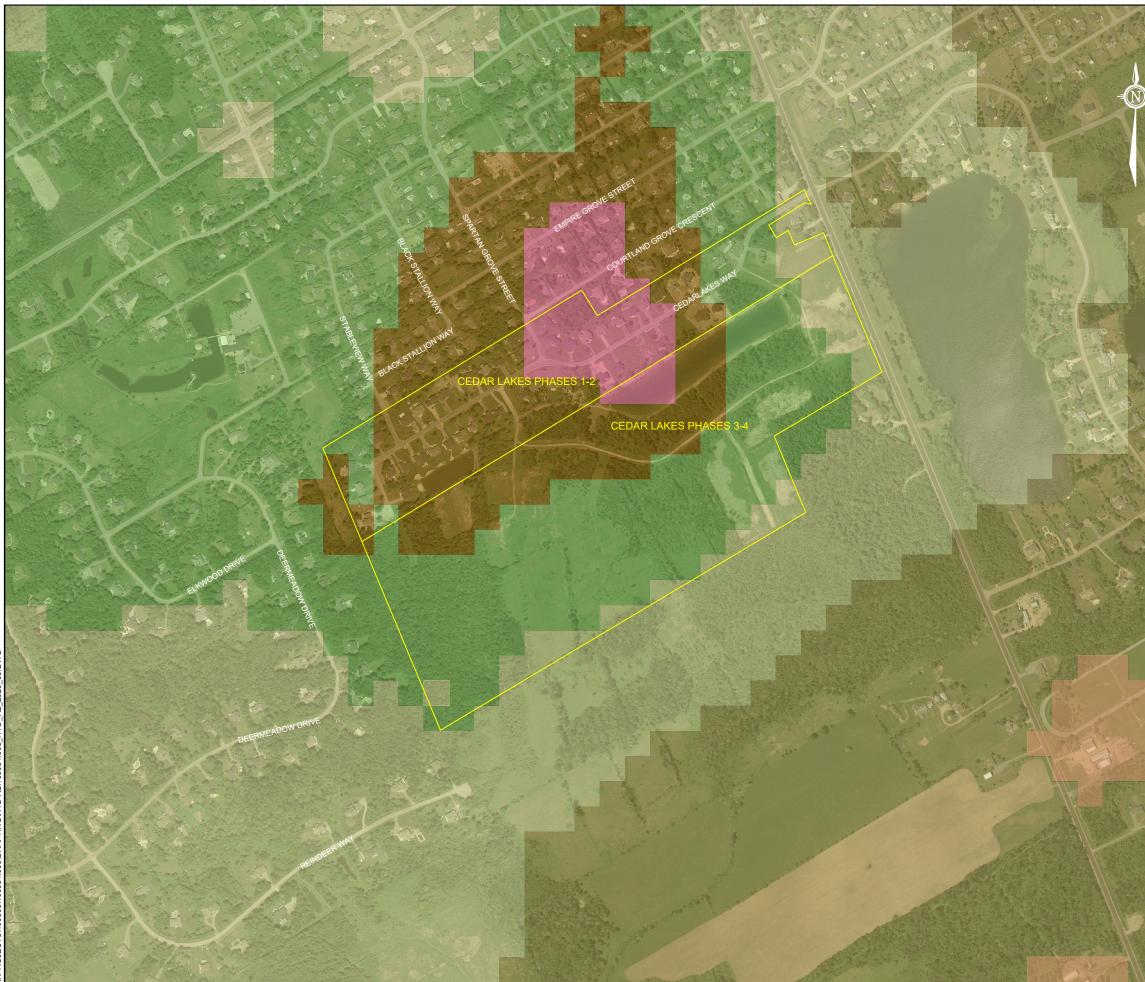
L'A	LEGEND				
		PROPERTY BOUN	IDARY		
	100	GROUND SURFA	CE ELEVATION,	METRES (CGVD2013))
2		DITCHES			
\cap		WATERCOURSE			
		WATERBODIES			
a trap		INFERRED SHALL	OW GROUNDW	ATER FLOW	
Ó					
~					
>					
······································					
400					
	GENERAL NOTE(S)				
134.2	 Coordinate system: Contains information 			nt Licence - Ontario.	
	 Maps Data: Google, Technologies. 	@2023 CNES / Airb	us, First Base So	olutions, Maxar	
	 Geographic dataset Contours derived fro Series. Contours are 0.5-m resolution lida 	m Lidar: High Resol approximate, as the	ution Digital Eleva ey are downsamp	led and smoothed from	tion 1
	SCALE 1:7500	- uuu (2020) for field			
	1.7000				
	0	150	300	450m	
		OGRAPHY	AND DRA	INAGE	
	CLIENT ARK ENG	INEERING	AND DEVI	ELOPMENT	
	PROJECT PROPO	SED RESIDE	NTIAL SUB	DIVISION	
	CE			ND 4	
C S	DRAWN BY	UTTAWA,	ONTARIO		
A	CZ/S	SL		AP/JKA	
	PROJECT NO. 100554	003	REVISION NO.	2	
	DATE	.003	FIGURE NO.	Ζ	
	MARCH	2025	FI	GURE 2	
				32 Steacie Drive	
		<u>Gem</u> t		Ottawa, ON K2K 2A9 Tel: (613) 836-1422	
		ONSULTING ENGI	NEERS	www.gemtec.ca ottawa@gemtec.ca	

CONSULTING ENGINEERS AND SCIENTISTS



LEGEND

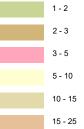
States and	
	PROPERTY BOUNDARY
	SURFICIAL GEOLOGY
	TILL
Sector Sector	7 GLACIOFLUVIAL DEPOSITS
	11b COARSE-TEXTURED GLACIOMARINE DEPOSITS
	11c COARSE-TEXTURED GLACIOMARINE DEPOSITS
Mar .	20
	ORGANIC DEPOSITS
1	
1	
States -	
997 - 19 19 - 19 19 - 19	
1000	
No. of	
100	
	GENERAL NOTE(S) 1. Coordinate system: NAD83, UTM ZONE 18
	 Contains information licensed under the Open Government Licence - Ontario. Maps Data: Google, @2023 CNES / Airbus, First Base Solutions, Maxar Technologies Geographic dataset source: Ontario GeoHub.
	SCALE 1:7500
A.S.	
States of	0 150 300 450m
-	ONTARIO GEOLOGIC SURVEY
Con Con	SURFICIAL GEOLOGY
A CONT	ARK ENGINEERING AND DEVELOPMENT
	PROJECT PROPOSED RESIDENTIAL SUBDIVISION
200	CEDAR LAKES PHASE 3 AND 4
	OTTAWA, ONTARIO
	DRAWN BY CZ/SL CHECKED BY AP/JKA
	PROJECT NO. REVISION NO.
	100554.003 2
	DATE FIGURE NO. MARCH 2025 FIGURE 3
	GEMTEC 32 Steacie Drive Ottawa, ON K2K 2A9 Tel: (613) 836-1422
	Consulting Engineers
	AND SCIENTISTS



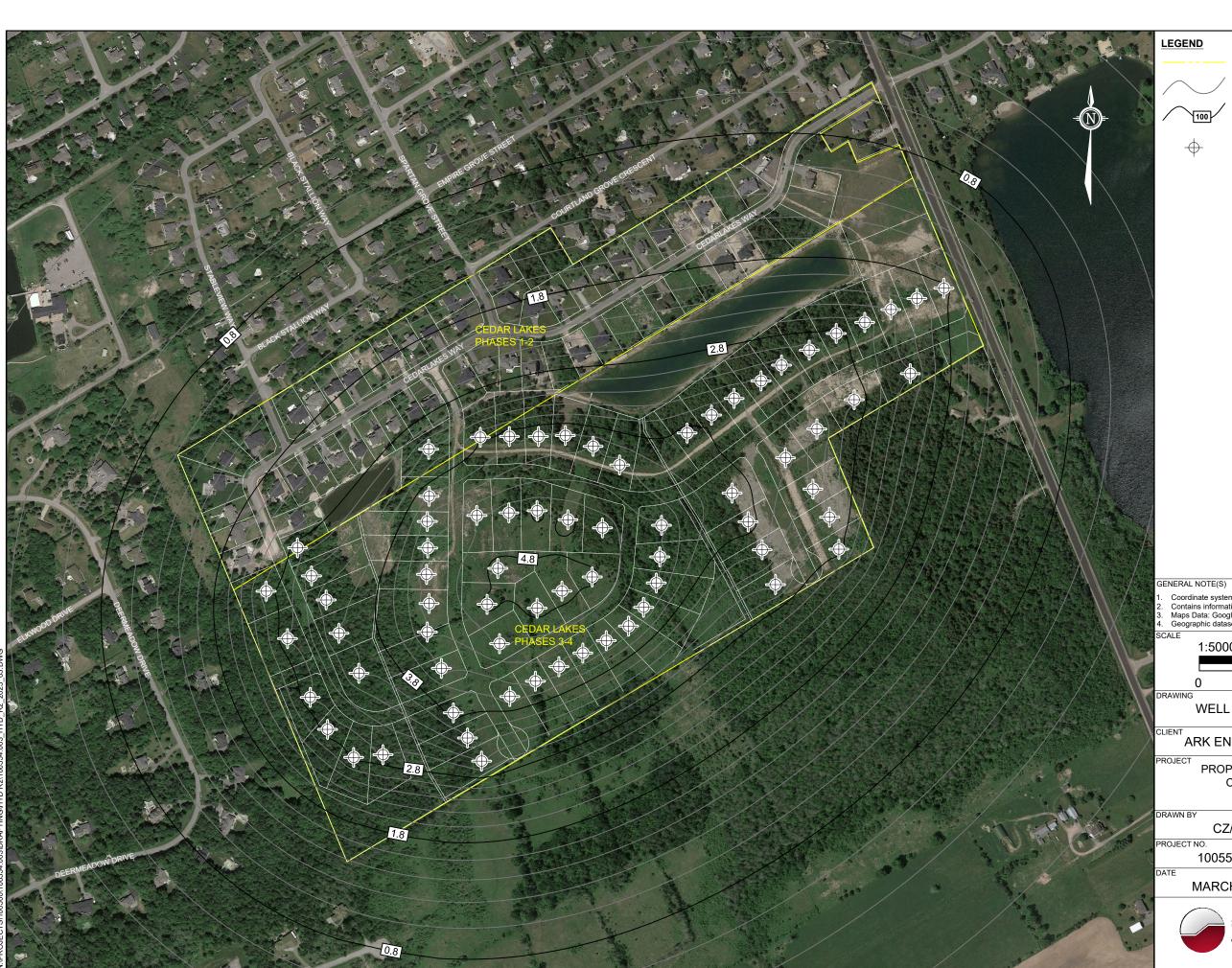
LEGEND

---- PROPERTY BOUNDARY

OVERBURDEN DRIFT THICKNESS, METRES



GENERAL NOTE(S)		
Coordinate system: NAD83, UTM ZONE Contains information licensed under the Maps Data: Google, @2023 CNES / Airt Geographic dataset source: Ontario Geo	Open Government Licous, First Base Solution	
SCALE 1:7500		
0 150	300	450m
		· — : <i>i</i>
OVERBURDEN 1		
ONTARIO GEOL OVERBURDEN 1 CLIENT ARK ENGINEERING	THICKNESS I	MAP
ONTARIO GEOL OVERBURDEN T ARK ENGINEERING PROJECT PROPOSED RESIDE CEDAR LAKES OTTAWA,	THICKNESS I AND DEVELO ENTIAL SUBDIV	MAP OPMENT /ISION
ONTARIO GEOL OVERBURDEN T ARK ENGINEERING PROJECT PROPOSED RESIDE CEDAR LAKES OTTAWA, DRAWN BY CZ/SL	THICKNESS I AND DEVELO ENTIAL SUBDIN PHASE 3 AND ONTARIO CHECKED BY	MAP OPMENT /ISION
ON TARIO GEOL OVERBURDEN T CLIENT ARK ENGINEERING PROJECT PROPOSED RESIDE CEDAR LAKES OTTAWA, DRAWN BY CZ/SL PROJECT NO. 100554.003	THICKNESS I AND DEVELO ENTIAL SUBDIN PHASE 3 AND ONTARIO CHECKED BY	MAP DPMENT /ISION 4
ONTARIO GEOL OVERBURDEN T CLIENT ARK ENGINEERING PROJECT PROPOSED RESIDE CEDAR LAKES OTTAWA, DRAWN BY CZ/SL PROJECT NO.	THICKNESS I AND DEVELO ENTIAL SUBDIV PHASE 3 AND ONTARIO CHECKED BY AP REVISION NO. FIGURE NO.	MAP OPMENT /ISION 4 /JKA



LEGEND

PROPERTY BOUNDARY

MINOR WATER TABLE DRAWDOWN CONTOUR, METRES



MAJOR WATER TABLE DRAWDOWN CONTOUR, METRES



71 WELLS IN SIMULATION

4. Geographic dataset source: Ontario Geo	Open Government Licence - Ontario. us, First Base Solutions, Maxar Technologies
SCALE	
1:5000	
0 100	200 300m
DRAWING	
WELL INTERFERE	NCES SIMULATION
ARK ENGINEERING	AND DEVELOPMENT
CEDAR LAKES OTTAWA,	NTIAL SUBDIVISION PHASE 3 AND 4 ONTARIO
DRAWN BY	CHECKED BY
CZ/SL	AP/JKA
PROJECT NO.	REVISION NO.
100554.003	2
DATE	FIGURE NO.
MARCH 2025	FIGURE 5
	www.gemtec.ca



_EG	θE	Ν	D
		Ь	
	$\overline{\tau}$		

IESI WELL	
(TW, PATERSON GROUP REPORT PH1276,	2011

NEW TEST WELL (TW)

X	MECP PUBLIC WELL RECORD
\sim	

PROPERTY BOUNDARY

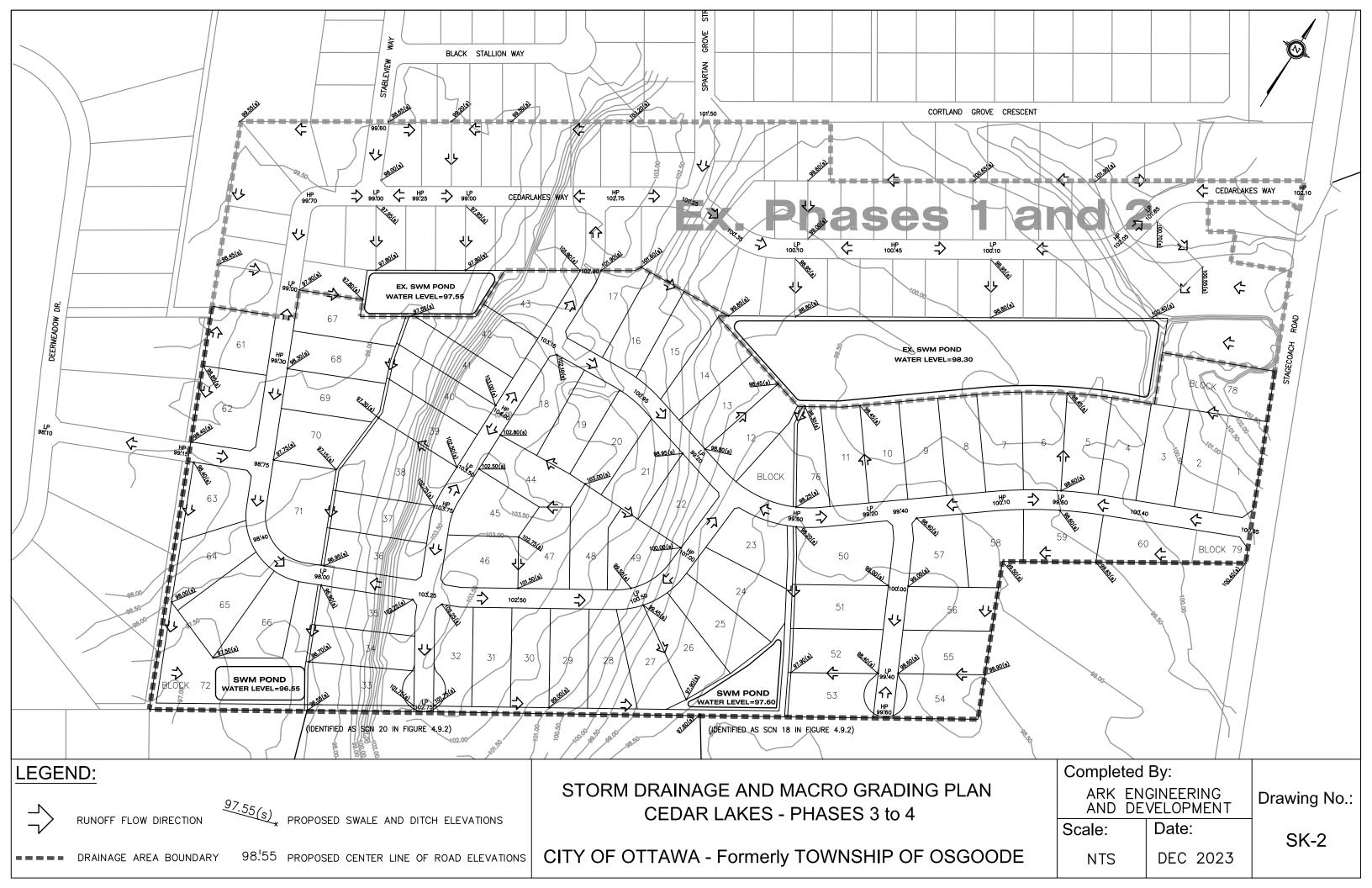
GENERAL	NOT	E(S)

- Coordinate system: NAD83, UTM ZONE 18 Contains information licensed under the Open Government Licence Ontario. Maps Data: Google, @2023 CNES / Airbus, First Base Solutions, Maxar Technologies

01	aset source: Ontario Geo	Hub.	
SCALE 1:75	500		
0	150	300	450m
DRAWING	DETAILED	SITE PLAN	
ARK E	NGINEERING	AND DEVEL	OPMENT
PROJECT PRC	POSED RESIDE CEDAR LAKES OTTAWA,		
DRAWN BY	Z/SL	CHECKED BY	P/JKA
PROJECT NO. 1005	554.003	REVISION NO.	2
date MAR(CH 2025	FIGURE NO.	SURE 6
	GEM CONSULTING ENGIN AND SCIENTISTS		2 Steacie Drive awa, ON K2K 2A9 I: (613) 836-1422 www.gemtec.ca awa@gemtec.ca

APPENDIX A

Storm Drainage and Macro Grading Plan (ARK Engineering and Development)



APPENDIX B

Background MECP Water Well Records

MECP WELL RECORD SEARCH (CEDAR LAKES PHASE 1 and 2)

ID	Township	Completion Date (yyyy-mn dd)	n- Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Recommended Pumping Rate (L/min)	Stratigraphic Layers (ft)
7206677	OSGOODE TOWNSHIP CON 03 007	7/15/2013	DO	84.7	7.01	42.4	5.6	UT 0268 UT 0271	75.71	SAND CLAY BLDR 0023 GREY LMSN 0250 GREY SNDS 0268 GREY SNDS 0271 GREY SNDS 0278
7206688	OSGOODE TOWNSHIP CON 03 007	7/5/2013	DO	61.0	3.96	39.9	6.0	UT 0188 UT 0193	56.78	SAND GRVL BLDR 0013 GREY LMSN 0178 GREY SNDS 0188 GREY SNDS 0193 WHIT SNDS 0200
7206697	OSGOODE TOWNSHIP CON 03 007	6/12/2013	DO	87.2	9.45	39.9	5.6	UT 0183 UT 0280	75.71	SAND 0015 SAND GRVL BLDR 0031 GREY LMSN 0118 GREY LMSN SNDS 0183 GREY LMSN SNDS 0225 WHIT SNDS 0280 WHIT SNDS 0286
7209277	OSGOODE TOWNSHIP CON 03 007	8/26/2013	DO	61.0	4.27	40.5	7.1	UT 0182 UT 0194	75.71	SAND GRVL BLDR 0014 GREY LMSN 0182 GREY LMSN 0194 GREY LMSN 0200
7209287	OSGOODE TOWNSHIP CON 03 007	7/30/2013	DO	85.3	10.97	39.9	5.5	UT 0254 UT 0272	75.71	SAND BLDR GRVL 0036 GREY LMSN 0185 WHIT SNDS 0254 WHIT SNDS 0272 WHIT SNDS 0280
7209290	OSGOODE TOWNSHIP CON 03 007	8/9/2013	DO	74.4	6.40	39.9	7.7	UT 0231 UT 0238	75.71	SAND BLDR 0021 GREY LMSN 0207 GREY LMSN SNDS 0232 WHIT SNDS 0238 WHIT SNDS 0244
7213072	OSGOODE TOWNSHIP CON 03 007	10/23/2013	DO	61.0	6.10	40.2	4.5	UT 0183 UT 0192	64.35	SAND GRVL BLDR 0017 GREY LMSN 0138 GREY LMSN SAND 0183 GREY LMSN SNDS 0192 GREY LMSN SNDS 0200 SAND GRVL BLDR 0017 GREY LMSN 0138 GREY LMSN SAND 0183 GREY LMSN SNDS 0192 GREY LMSN
7213072	OSGOODE TOWNSHIP CON 03 007	11/7/2013	DO	61.0	5.18	40.2	4.6	UT 0183 UT 0192	75.71	SAND GRVL BLDR 0017 GREY LMSN 0138 GREY LMSN SAND 0183 GREY LMSN SNDS 0192 GREY LMSN SNDS 0200 BRWN LOAM STNS 0010 GREY SAND BLDR LOOS 0024 GREY TILL BLDR PCKD 0038 GREY LMSN SNDS
7218731	OSGOODE TOWNSHIP	4/1/2014	DO	83.8	11.89	39.9	4.0	UT 0190 UT 0270	26.50	BRWN LOAM STNS 0010 GREY SAND BLDR LOOS 0024 GREY TILL BLDR PCKD 0038 GREY LMSN SNDS HARD 0275 SAND CLAY BLDR 0029 GREY LMSN 0180 GREY SNDS 0181 GREY SNDS 0220 WHIT SNDS 0254 WHIT
7222301	OSGOODE TOWNSHIP CON 03 007	4/24/2014	DO	79.2	8.84	39.9	5.5	UT UT 0054	75.71	SAND CLAY BLDR 0029 GREY LMSN 0180 GREY SNDS 0181 GREY SNDS 0220 WHIT SNDS 0254 WHIT SNDS 0260
7222309	OSGOODE TOWNSHIP CON 03 007	5/28/2014	DO	67.1	5.49	40.2	4.7	UT 0150 UT 0214	75.71	SAND GRVL CLAY 0018 GREY LMSN 0150 GREY LMSN 0214 GREY LMSN 0220
7222318	OSGOODE TOWNSHIP CON 03 007	5/6/2014	DO	67.1	8.84	42.4	4.5	UT 0173 UT 0211	75.71	SAND GRVL BLDR 0029 GREY LMSN 0160 WHIT SNDS 0173 WHIT SNDS 0211 WHIT SNDS 0220
7222321	OSGOODE TOWNSHIP CON 03 007	5/20/2014	DO	61.0	8.53	39.9	4.9	UT 0158 UT 0172 UT 0194	75.71	SAND 0022 GRVL BLDR 0028 GREY LMSN 0140 GREY SNDS LMSN 0158 GREY SNDS LMSN 0172 GREY SNDS LMSN 0194 GREY SNDS LMSN 0200
7222329	OSGOODE TOWNSHIP CON 03 007	5/22/2014	DO	73.8	5.18	40.5	7.2	UT 0233	75.71	SAND BLDR 0017 GREY LMSN 0197 WHIT SNDS 0233 WHIT SNDS 0242
7222332	OSGOODE TOWNSHIP CON 03 007	5/23/2014	DO	91.4	7.92	39.9	4.9	UT 0188 UT 0255 UT 0293	75.71	BLDR SAND CLAY 0026 GREY LMSN 0188 GREY LMSN 0190 BRWN SNDS 0255 BRWN SNDS 0260 BRWN SNDS I MSN 0293 BRWN SNDS I MSN 0300
7222334	OSGOODE TOWNSHIP CON 03 007	6/2/2014	DO	73.2	8.53	40.2	8.1	UT 0221 UT 0233	75.71	SAND 0020 GRVL BLDR 0028 GREY LMSN 0169 WHIT SNDS 0221 WHIT SNDS 0233 WHIT SNDS 0240
7226477	OSGOODE TOWNSHIP CON 03 007	5/26/2014	DO	97.5	13.11	39.9	7.8	UT 0288 UT 0299	75.71	SAND GRVL BLDR 0043 GREY LMSN 0201 GREY SNDS 0288 GREY SNDS 0299 GREY SNDS 0320
7226505	OSGOODE TOWNSHIP CON 03 007	7/31/2014	DO	91.4	8.84	40.2	5.9	UT 0180 UT 0248 UT 0294	75.71	SAND CLAY 0011 GRVL BLDR 0029 GREY LMSN 0180 GREY LMSN 0190 GREY SNDS 0248 GREY SNDS 0294 GREY SNDS 1000 PEAT 0004 GREY SAND GRVL BLDR 0036 GREY LMSN 0180 GREY SNDS LMSN 0230 GREY SNDS LMSN
7228012	OSGOODE TOWNSHIP CON 03 007	8/27/2014	DO	73.2	10.97	42.7	5.3	UT 0230	75.71	PEAT 0004 GREY SAND GRVL BLDR 0036 GREY LMSN 0180 GREY SNDS LMSN 0230 GREY SNDS LMSN 0240
7230309	OSGOODE TOWNSHIP CON 03 007	9/2/2014	DO	73.2	6.40	39.9	3.6	UT 0232	75.71	SAND GRVL BLDR 0021 GREY LMSN 0119 GREY SNDS LMSN 0232 GREY SNDS LMSN 0240
7230311	OSGOODE TOWNSHIP CON 03 007	9/4/2014	DO	67.1	7.62	40.2	5.2	UT 0213	75.71	SAND GRVL BLDR 0025 GREY LMSN 0125 GREY LMSN SNDS 0150 GREY SNDS 0213 GREY SNDS 0220
7230313	OSGOODE TOWNSHIP CON 03 007	11/13/2014	DO	86.9	9.75	39.9	8.0	UT 0266 UT 0279	75.71	SAND GRVL BLDR 0032 GREY LMSN 0180 GREY SNDS 0266 GREY SNDS 0279 GREY SNDS 0285
7233596	OSGOODE TOWNSHIP	5/1/2015	DO	61.0	4.57	39.9	5.3	UT 0029 UT 0115 UT 0187	45.50	BRWN CLAY STNS PCKD 0008 BRWN SAND STNS LOOS 0015 GREY LMSN HARD 0142 GREY SNDS HARD 0200
7243023	OSGOODE TOWNSHIP CON 03 007	5/27/2015	DO	48.8	9.14	39.9	6.3	UT 0138 UT 0140 UT 0154	75.71	SAND BLDR GRVL 0030 GREY LMSN 0138 GREY LMSN 0140 GREY LMSN 0154 GREY LMSN 0160
7244913	OSGOODE TOWNSHIP CON 03 007	7/7/2015	DO	61.0	5.18	39.9	11.4	UT 0194	75.71	SAND BLDR 0017 GREY LMSN 0140 GREY SNDS 0194 GREY SNDS 0200
7248797	OSGOODE TOWNSHIP CON 03 007	7/10/2015	DO	77.1	9.14	39.9	11.3	UT 0168 UT 0246	75.71	SAND GRVL BLDR 0030 GREY LMSN 0160 WHIT SNDS LMSN 0168 WHIT SNDS LMSN 0246 WHIT SNDS I MSN 0253
7248800	OSGOODE TOWNSHIP CON 03 007	9/9/2015	DO	76.2	8.84	39.9	4.4	UT 0240 UT 0244	75.71	SAND CLAY BLDR 0029 GREY LMSN 0101 GREY SNDS LMSN 0242 GREY SNDS LMSN 0250
7252286	OSGOODE TOWNSHIP CON 03 007	12/9/2015	DO	85.3	7.92	39.9	4.7	UT 0223 UT 0271	75.71	SAND GRVL BLDR 0026 GREY LMSN 0113 GREY SNDS 0223 GREY SNDS 0271 GREY SNDS 0280
7255463	OSGOODE TOWNSHIP CON 03 007	12/21/2015	DO	73.2	5.79	39.9	8.3	UT 0205 UT 0234	75.71	SAND GRVL BLDR 0019 GREY LMSN 0103 GREY SNDS 0205 GREY SNDS 0234 GREY SNDS 0240
7266070	OSGOODE TOWNSHIP	6/1/2016	DO	54.9	12.80	36.6	9.1	FR 0153 FR 0168	37.85	BRWN SAND 0008 BLUE SAND STNS GRVL 0042 GREY LMSN 0160 WHIT SNDS 0180
7268457	OSGOODE TOWNSHIP CON 03 007	6/2/2016	DO	67.4	4.57	39.9	9.2	UT 0212	75.71	SAND GRVL BLDR 0015 GREY LMSN 0110 GREY SNDS 0212 GREY SNDS 0221
7268458	OSGOODE TOWNSHIP CON 03 007	7/4/2016	DO	67.1	5.18	39.9	7.5	UT 0212 UT 0214	75.71	SAND GRVL BLDR 0017 GREY LMSN 0112 GREY SNDS LMSN 0125 GREY SNDS 0212 GREY SNDS 0214 GREY SNDS 0220
7268401	OSGOODE TOWNSHIP CON 03 007	5/30/2016	DO	75.9	9.75	40.2	9.5	UT 0140 UT 0241	75.71	SAND GRVL BLDR 0032 GREY LMSN 0104 GREY SNDS 0140 GREY SNDS 0241 GREY SNDS 0249
7268432	OSGOODE TOWNSHIP CON 03 007	8/11/2016	DO	62.5	11.28	39.9	11.8	UT 0199	75.71	SAND BLDR 0029 GRVL 0037 GREY LMSN 0116 GREY SNDS 0199 GREY SNDS 0205
7272964	OSGOODE TOWNSHIP CON 03 007	12/14/2016	DO	49.4	10.97	39.9	5.9	UT 0135 UT 0153	75.71	SAND GRVL BLDR 0036 GREY LMSN 0111 GREY SNDS LMSN 0135 GREY SNDS LMSN 0153 GREY SNDS LMSN 0162
7279820	OSGOODE TOWNSHIP CON 03 007	6/1/2017	DO	62.8	7.92	39.9	4.9	UT 0197 UT 0200	75.71	SAND BLDR 0023 GREY LMSN 0112 GREY SNDS 0197 GREY SNDS 0200 GREY SNDS 0206
7292119	OSGOODE TOWNSHIP CON 03 007	7/10/2017	DO	67.4	6.10	39.9	4.9	UT 0216	75.71	CLAY GRVL 0020 GREY LMSN 0101 GREY SNDS LMSN 0216 GREY SNDS LMSN 0221
7296288	OSGOODE TOWNSHIP CON 03 007	7/17/2017	DO	61.6	6.40	39.9	5.3	UT 0188 UT 0094	75.71	SAND GRVL 0012 CLAY 0016 GRVL 0021 GREY LMSN 0127 GREY SNDS 0202
7296291	OSGOODE TOWNSHIP CON 03 007	11/13/2017	DO	61.0	6.10	39.9	4.4	UT 0187 UT 0194	75.71	SAND GRVL 0020 GREY LMSN 0169 GREY SNDS 0200
7301334	OSGOODE TOWNSHIP CON 03 007	10/18/2017	DO	67.1	9.45	39.9	3.6	UT 0214	75.71	SAND GRVL 0031 GREY LMSN 0109 GREY SNDS 0220
7301341	OSGOODE TOWNSHIP CON 03 007	12/3/2017	DO	70.4	5.18	39.9	4.8	UT 0197 UT 0225	75.71	SAND GRVL 0017 GREY LMSN 0127 GREY SNDS 0231
7301368	OSGOODE TOWNSHIP CON 03 007	3/1/2018	DO	64.3	6.40	39.9	8.0	UT 0197 UT 0205	75.71	SAND GRVL 0021 GREY LMSN 0101 GREY SNDS 0211
7310006	OSGOODE TOWNSHIP CON 03 007	3/6/2018				39.9	4.8		56.78	
7310019	OSGOODE TOWNSHIP CON 03 007	7/5/2018	DO	61.0	6.10	39.9	9.5	UT 0190 UT 0192	75.71	SAND CLAY 0020 GREY LMSN 0117 GREY SNDS 0200
7318097	OSGOODE TOWNSHIP CON 03 007	7/3/2018	DO	67.1	5.18	39.9	9.0	UT 0210	75.71	SAND GRVL 0017 GREY LMSN 0147 GREY SNDS 0220
7321082	OSGOODE TOWNSHIP CON 03 007	8/23/2018	DO	58.5	5.79	39.9	7.5	UT 0186	75.71	GRVL SAND 0019 GREY LMSN 0083 GREY SNDS LMSN 0107 GREY SNDS 0192
7321156	OSGOODE TOWNSHIP CON 03 007	11/28/2018	DO	61.0	5.18	39.9	4.2	UT 0194	75.71	BLDR SAND 0017 GREY LMSN 0148 GREY SNDS 0200
7325694	OSGOODE TOWNSHIP CON 03 007	4/5/2019	DO	43.0	6.71	39.9	4.2	UT 0135	75.71	SAND GRVL BLDR 0022 GREY LMSN 0103 GREY SNDS LMSN 0135 GREY SNDS LMSN 0141
7336806	OSGOODE TOWNSHIP CON 03 007	10/3/2019	DO	73.5	5.79	39.9	6.5	UT 0173 UT 0231	75.71	SAND GRVL BLDR 0019 GREY LMSN 0116 GREY SNDS 0173 GREY SNDS 0233 GREY SNDS 0241
7346278	OSGOODE TOWNSHIP CON 03 007	7/24/2020	DO	64.6	7.92	39.9	12.2	UT 0206	75.71	SAND CLAY BLDR 0026 GREY LMSN 0124 WHIT LMSN 0206 GREY LMSN 0212
7367011	OSGOODE TOWNSHIP CON 03 007	11/11/2020	DO	59.1	9.75	39.9	12.2	UT 0188	75.71	SAND CLAY BLDR 0027 GRVL 0032 GREY LMSN 0112 GREY SNDS GREY LMSN 0194
7377719	OSGOODE TOWNSHIP CON 03 007	7/13/2021	DO	73.1	4.88	39.9	4.3	UT 0171 UT 0234	68.14	SAND BLDR 0016 GREY LMSN GREY SNDS 0177 GREY SNDS 0240
https://www.ont "Well Use"	ario.ca/page/map-well-records	"Water Detail"		Other	Parameter	10 th Percentile	90 th Percentile	Geometric Mean		
DO Do	vestock	FR SA	Fresh Salty	NA	Static Water Level (m) Depth to Bedrock (m)	4.2 4.9	10.8 11.0	6.2 7.2	-	
IR Irri	gation	SU	Sulphur		Total Well Depth (m)	58.6	86.6	68.4	1	
CO Co	dustrial ommercial	MN UK	Mineral Unknown		Recommended Pump Rate (L/min) Bearing Zone Depth (m)	59.1 43.3	75.7 82.5	71.3 59.5]	
PS Pu	unicipal Iblic	GS IR	Gas Iron							
AC Co	ooling and A/C ot Used									

il"	Other	Parameter	10 th Percentile	90 th Percentile	Geometric Mean
Fresh	NA	Static Water Level (m)	4.2	10.8	6.2
Salty		Depth to Bedrock (m)	4.9	11.0	7.2
Sulphur		Total Well Depth (m)	58.6	86.6	68.4
Mineral		Recommended Pump Rate (L/min)	59.1	75.7	71.3
Unknown		Bearing Zone Depth (m)	43.3	82.5	59.5
Gas					
Iron					

"Well Use" DO ST IR IN CO MN PS AC AC NU OT TH DE MO MT Domestic Livestock
 Irrigation
 Industrial
 Commercial
 Municipal
 Public
 Cooling and A/C
 Not Used
 Other
 Test Hole
 Dewatering
 Monitoring Test



MECP WELL RECORD SEARCH (East and West)

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Deptl (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Recommended Pumping Rate (L/min)	Stratigraphic Layers (ft)
					W	EST OF SITE (Fig	ure 6)			
1533532	OSGOODE TOWNSHIP CON 04 009	12/18/2002	DO	48.8	12.2	15.8	12.2	UK 0114 UK 0151	45.4	SAND GRVL BLDR 0040 GREY LMSN 0160
7195941	OSGOODE TOWNSHIP CON 03 008	11/29/2012	DO	65.5	13.1	14.9	6.3	UT 0196 UT 0208	75.7	SAND GRVL 0021 SAND CLAY 0043 GREY LMSN 0142 GREY SNDS 0196 GREY SNDS 0208 GREY SNDS 021
1529970	OSGOODE TOWNSHIP CON 03 008	4/13/1998	DO	14.3	13.4	13.4	4.9	FR 0045	45.4	BRWN SAND 0018 GREY SAND 0025 GREY CLAY QSND 0042 GREY SAND GRVL 0044 GREY LMSN ROCK 00-
1530643	OSGOODE TOWNSHIP CON 03 008	7/6/1999	DO	61.0	38.1	7.9	6.1	UK 0169	18.9	BRWN SAND 0008 GREY SAND 0014 GREY SAND GRVL BLDR 0125 GREY SNDS VERY HARD 0200
1530950	OSGOODE TOWNSHIP CON 03 008	10/25/1999	DO	61.0	6.1	7.9	6.7	UK 0030 UK 0191	18.9	BRWN LOAM STNS 0020 GREY LMSN 0095 GREY SNDS 0200
1530951	OSGOODE TOWNSHIP CON 03 008	10/26/1999	DO	22.9	4.6	7.0	1.5	UK 0035 UK 0062	18.9	BRWN SAND 0009 GREY SAND GRVL BLDR 0015 GREY LMSN 0075
1531517	OSGOODE TOWNSHIP CON 03 008	10/11/2000	DO	16.8	6.4	9.9	1.8	UK 0048	18.9	BRWN LOAM SNDY 0008 GREY SAND STNS 0021 GREY LMSN 0055
1531518	OSGOODE TOWNSHIP CON 03 008	10/11/2000	DO	14.6	4.6	8.1	1.8	UK 0042	18.9	BRWN SAND 0008 GREY SAND STNS 0015 GREY LMSN 0048
1532051	OSGOODE TOWNSHIP CON 03 008	6/19/2001	DO	78.6	9.8	10.7	6.7	UK 0250	18.9	BRWN SAND 0008 GREY SAND 0026 GREY SAND GRVL BLDR 0032 GREY LMSN 0130 GREY SNDS 0258
1532535	OSGOODE TOWNSHIP CON 03 008	11/20/2001	DO	14.6	4.9	7.9	2.1	UK 0037	18.9	BRWN SAND 0005 GREY SAND WBRG 0012 GREY CLAY STNS 0016 GREY LMSN 0048
1532536	OSGOODE TOWNSHIP CON 03 008	11/20/2001	DO	22.3	7.3	10.1	2.7	UK 0066	18.9	BRWN SAND STNS 0005 GREY SAND 0009 GREY SAND GRVL BLDR 0024 GREY LMSN 0073
1532703	OSGOODE TOWNSHIP CON 03 008	3/14/2002	DO	14.3	4.9	8.2	1.5	UK 0035	18.9	BRWN SAND 0007 GREY SAND 0012 GREY SAND GRVL BLDR 0016 GREY LMSN LYRD 0022 GREY LMSN HA
1533529	OSGOODE TOWNSHIP CON 03 008	11/26/2002	DO	25.6	6.1	9.4	3.4	UK 0060 UK 0073	83.3	0047 SAND BLDR 0020 GREY LMSN 0084
1533781	OSGOODE TOWNSHIP CON 03 007	6/3/2003	DO	79.6	10.1	14.0	4.6	UK 0251	75.7	SAND GRVL 0033 GREY LMSN 0103 GREY SNDS 0261
7118473	OSGOODE TOWNSHIP CON 03 009	12/4/2008	DO	79.2	10.7	13.3	2.4	UT 0246	75.7	CLAY 0015 SAND 0025 GRVL 0035 GREY LMSN 0208 GREY LMSN SNDS 0260
7121811	OSGOODE TOWNSHIP CON 03 009	2/25/2009	DO	85.3	9.1	11.6	2.6	UT 0171 UT 0261 UT 0276	75.7	SAND GRVL BLDR 0030 GREY LMSN 0148 GREY SNDS LMSN 0280
7121812	OSGOODE TOWNSHIP CON 03 009	2/24/2009	DO	85.3	9.1	11.6	2.9	UT 0166 UT 0256 UT 0272	75.7	SAND GRVL BLDR 0030 GREY LMSN 0145 GREY SNDS LMSN 0280
7126823	OSGOODE TOWNSHIP 006	7/13/2009	DO	69.7	8.8	12.1	2.6	FR 0209	170.3	BLUE SAND SOFT 0006 GREY CLAY SAND SOFT 0029 GREY LMSN DLMT HARD 0229
7139849	OSGOODE TOWNSHIP CON 03 009	10/10/2009	DO	22.2	10.1	13.1	2.2	UT 0065	172.2	BRWN LOAM SNDY STNS 0012 GREY CLAY STNS 0033 GREY LMSN 0073
7156837	OSGOODE TOWNSHIP CON 03 009	11/10/2010	DO	42.6	9.7	12.8	3.2	UT 0131	132.5	BRWN CSND HARD 0011 GREY CSND HARD 0025 GREY GRVL STNS PCKD 0032 GREY SNDS LYRD 0140
					EA	ST OF SITE (FIG	JRE 6)			
1514884	OSGOODE TOWNSHIP CON 04 007	6/26/1975	DO	16.8	12.5	13.1	0.9	FR 0054	18.9	GREY SAND 0008 GREY CLAY STNS 0041 GREY LMSN 0055
1521974	OSGOODE TOWNSHIP CON 04 008	8/6/1987	DO	60.0	18.6	19.2	2.4	FR 0180	37.9	BRWN SAND STNS 0009 GREY SAND GRVL BLDR 0061 GREY LMSN 0178 GREY SNDS ROCK FCRD 0197
1529955	OSGOODE TOWNSHIP CON 04 008	10/24/1997	DO	64.0	14.3	17.1	9.8	FR 0143 FR 0202 FR 0204	132.5	SAND GRVL BLDR 0047 GREY LMSN 0167 GREY SNDS 0210
1531681	OSGOODE TOWNSHIP CON 04 008	11/30/2000	DO	61.0	14.9	18.3	8.5	UK 0187	18.9	BRWN SAND BLDR 0014 GREY HPAN BLDR 0049 GREY LMSN HARD 0143 GREY SNDS HARD 0200
1531733	OSGOODE TOWNSHIP CON 04 010	1/9/2001	DO	18.0	-	16.8	3.7	UK 0055	37.9	BRWN SAND FILL 0018 GREY TILL GRVL SAND 0052 GREY GRVL SAND 0059
1531933	OSGOODE TOWNSHIP CON 04 009	5/29/2001	DO	38.1	16.5	19.5	5.2	UK 0116	18.9	BRWN SAND GRVL BLDR 0032 GREY HPAN BLDR 0054 GREY LMSN 0125
1533235	OSGOODE TOWNSHIP CON 08 013	10/9/2002	DO	42.7	16.5	19.5	7.3	FR 0130	75.7	BRWN SAND PCKD 0010 GREY GRVL SAND PCKD 0054 GREY LMSN ROCK FCRD 0060 GREY LMSN ROCK HA 0140
1533532	OSGOODE TOWNSHIP CON 04 009	12/18/2002	DO	48.8	12.0	6.7	12.2	UK 0114 UK 0151	45.4	SAND GRVL BLDR 0040 GREY LMSN 0160
1533607	OSGOODE TOWNSHIP CON 04 007	2/27/2003	DO	25.3	-	6.7	7.3	FR 0078	-	BRWN TILL HARD 0008 GREY TILL HARD 0042 GREY LMSN LYRD 0083
1534632	OSGOODE TOWNSHIP CON 04 008	4/7/2004	AC	61.0	12.2	6.7	6	UK 0169 UK 0189	91.0	SAND GRVL 0040 GREY LMSN 0180 GREY SNDS 0200
1534633	NORTH GOWER TOWNSHIP CON 04 008	4/5/2004	DO	61.0	12.3	6.7		UK 0130 UK 0144	91.0	SAND GRVL 0040 GREY LMSN 0165 GREY SNDS 0200
1535992	OSGOODE TOWNSHIP 04 010	9/30/2005	DO	30.5	14.3	18.3	7.1	0082 0094	91.0	SAND BLDR 0047 GREY LMSN 0100
1536208	OSGOODE TOWNSHIP CON 04 007	11/11/2005	DO	57.9	13.7	16.4	5.9	0182	91.0	SAND GRVL BLDR 0045 GREY LMSN 0120 GREY SNDS 0190
7169519	OSGOODE TOWNSHIP CON 04 009	9/16/2011	DO	25.8	18.5	-	6.2	FR 0063	45.0	BRWN SAND BLDR LOOS 0025 GREY GRVL SAND SHLE 0061 GREY LMSN HARD 0084
7195941	OSGOODE TOWNSHIP CON 03 008	11/29/2012	DO	65.5	13.1	14.9	6.3	UT 0196 UT 0208	75.7	SAND GRVL 0021 SAND CLAY 0043 GREY LMSN 0142 GREY SNDS 0196 GREY SNDS 0208 GREY SNDS 021
7371675	OSGOODE TOWNSHIP CON 04 007	7/3/2020	DO	43.6	14.0	15.8	4.6	UT 0062 UT 0100 UT 0135	75.7	BLDR SAND 0046 GREY SHLE LMSN 0143

https://www.ontario.ca/page/map-well-records "Well Use"

DO	Domestic	Parameter	10 th Percentile	90 th Percentile	Geometric Mean	10 th Percentile	90 th Percentile	Geometric Mean
				WEST OF SITE			EAST OF SITE	
"Water De	etail"	Static Water Level (m)	1.5	6.7	3.3	1.8	10.8	5.4
FR	Fresh	Casing Length (m)	7.9	14.8	10.7	6.7	19.5	13.3
SA	Salty	Depth to Bedrock (m)	4.6	13.4	8.6	12.1	18.5	14.4
SU	Sulphur	Total Well Depth (m)	14.4	84.8	37.3	17.6	64.5	41.2
MN	Mineral	Bearing Zone Depth (m)	17.8	61.9	26.2	17.8	61.9	38.5
UK	Unknown	Recommended Pump Rate (L/min)	18.9	166.6	43.2	18.9	107.6	53.2
GS	Gas	Available Drawdown (metres)	9.6	78.9	27.7	12.4	56.8	31.6
IR	Iron							



TEST WELL RECORDS

- lia lanan 1	C.14 C	138383277		ΔΤΙ	R ROCK			PAGE	85/13
12/18/2009 1	16:14 0.	130303277	Δ	08935	Δ	_	IRIAN	Record	
J. Ma	Minis	inv of	Well T.	00300	30/aw)		S Ontario Weter A	record esources Act	
Ont	ario the En	nvironment	A	1893	54	Kegulanon s	Page	of	
Measurements	s recorded in: 1.71	Metric XI Impariol	T	00100		<u> </u>	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
	in linformation				E-mail Address		, C W	all Constructed Well Owner	
Firstmans	- 1	Lach Name / Brganization	000	nelopi	Province	Postal Rode	Telephone No. (
Mailing Addres	L'ALE NUMBER		1 IAtox	ipality Crp	exu a	Smit	5440	66	
659	Step	ple there	1. 1. 1. 1. 1.			Lal	1 Concession		
Well Location	ell Location (Streps 1)	umbermame)	A PTOWN	ishing PR	ande.	: 8			
Aui	CVMuencipality	page Coas	City/	Town/Village	A		Ontario		
1 550	TATA - L	arlate	Muni	icipel Plan and Sublo	Number	-1	স্কি		
UTUI CONCINE	ales Zone Easing	Louda Sugar	0-7						
NAD 1 8	and Bedrock Mate	HOAN DOOT	aling Record	(see Instructions on the Materials	back of this round Ge	eneral Description	i Fr	Deptr (m(t))	
General Col		mmon Muleriel	Oumri	NILLIGALALS			0	· 25'	
	San	a d a la	zuel_				2	5' 331	
	Gren	1-Sland	11-1					1-138	
	Gran	ver + Pr	ereca.	estro			38	145	
	-Gress	1 Broin	J IST	adsta	L.			5' 180'	*
	Gree	la monde		XIZL D - free					
2015 F		<u> </u>	,						
			-		d_	and	- NEW	a spanete	
A6 \$ 8887		160-45			DAI	KIP	CARAVE	71/1-2	
	Lesi V	AmularSpace			Amer trat of well	Resulte.or W	Itell Yield Testing.	Recovery	
Oppr S	iet at (nk.RI)	Type of Sealant Use (Material and Type)	zd .	Volume Placed	Omar, jeter	AND THE A	(min) (avit)	Tyna Water Level (ntin) (nvt?)	
From.	SACATA	1Canoral	JUNY	1-8	H pumping disc	antinued, give reason	T Static 14-1	<u></u>	
44	1345 IVia	+ 50 Ami	esiwin	6.8	1 2	5	1244	1	
24.				() 	Furrip sittake s	a al (form)	2 30'7'		
576 WITH	· · · · · · · · · · · · · · · · · · ·	······································	a constant		Pumping (ete	(Vimia / GRM)	334'9'	anterior and a second se	
	that of Construct	ion.	Well-Us		1 0	0	1 895	4	
Cable	Tool Do	ismond Lipublic	Comme		Ng NT +	mpung min	5426	5	
Flotary		inving Duvestock	The the		19 Final water law	Hand of puttoing (A	1045.7 9	" 10	
C Boring	,	ligging Dirngston			6	rata (Umin / GPM)	- 15 4'	15	
Cober.	000011	Other. 40		. Status of Wel		~	20/4 6	4 20	14
	11. 0013	tion Resord - Casing .	באוידה והמנים	Reptacement W		ea ouro depth (my	2567'3	* 25	
inșădu Quarret (creat	ler i Galvanzad, More		To	Tek Hole	Recorderer	ed gump rate	3067'3	30	
1	12400	188 12	3' 144	C Recharge Well	H (Mmin (PM)		- 19672	40	
-15	Tit ma	The is	4 180	C Observation and Monitoring Hold	DUDDING INGVY		50 67'2	£ 50	
	1-lip Sparad			Construction)	Disinfected?) pkg	60 67'8) ⁴ 60	
				Abandoneo. Insufficient Sur	VOIN 1		of Welthocation		
د سود. سببه ود و		uction Record - Seman	Depth (mitt)	Asendoned, P. Weter Quality	11	- E /	Mang manuakons on t	TO DOCK	
Carsi Diam	Walertai	NO. SPORTO Sine No.	Provit To	Abanooned. of	the I m	itch !	Outen		
(<u>unv</u>	/m)_ <u></u>				-		[°]	114Mot	
• ب								1. 19	
		fater Details		Hole Diameter	meter			V 8 -	T.
Water	tound at Depth Kind	of Water _ Freah X.	Intested From	Japan Con Jay	nsal	14	N		¢
. mm /	. Y	Giber apecily	-	144 6	141	* /		a con	7
				1180 5	5/14	1	1	5	
Wate	r lound at Depth Kin	d or water, the -				K	TTU#1	ITA	
	· VUNI	Contractor and Well T	chalcian Info	Well Contre Line	No No	(L)	<i>.</i>		
Rusin	VESS Name of Wall Co	DOILLS	CC.	TD III		<u>.</u>			
L.	Aughous (Streat)	Number/Magnice)	D	Municipality		The	tubl	[#]	
P	H-1	04 DR.m	mail Address	CHMON		er's Date Package	Delivered	Ministry Uae Only	
ind. O	rline K	- "her"		artic Eirol Name	Vveil own mamsaik package		12:15	1 2 10822	3
But	Teksorone No, inc and	NO LOOK) TVBITC OT VICIT TO	choiden (Last N	PUAN	Catter and	Em ing lainde Fr			
6	13 3 28 -	Signardire of Technica	And or Contract	tor Dave Submitted	E No	Dig	A14-	פרע הכל <u>ה</u>	
-	-BASA	- Hongi	2	Ministry'	·		Sector Sector	Guoon a Printer for Origino	2007
USCA	וזענייטויי			anotise y					

ļ

Ministry of the Environment, Well Record Ontario 🕅 Well Tag, No. (Place Sticker and/or Print Below) Conservation and Parks Regulation 903 Ontario Water Resources Act Measurements recorded in:
Metric Imperial 5 Page Well Owner's Information 80848 Wail Address U Well Constructed First Name by Well Owner Municipality K HOGS pirel Mailing Address Dr age \$105 6 0 Well Location Address of Well Location (Street Number/Name Tow Lot Concession 8 2000 C Ex 1 16 Postal Code City/To Province County Ontario ector Re Municipal Plan and Sublot Number Northing Other 18454049500785 (# NAD 83 W Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form) Depth (m/t) From General Colour Most Common Material Other Materials General Description isting U P \$1 0 180 \bigcirc K 6 N AIW 4 ひ非 rel Dinor 20 diast 1 Annular Space **Results of Well Yield Testing** Depth Set at (m/ft) From | To Draw Down Type of Sealant Used Volume Placed (m³/it*) After test of well yield, water was: Recovery Clear and sand free Time Water Level Water Level (Material and Type) Time (min) (m/ft) (min) (m/ft) 10 Other, specify tai 25 Static If pumping discontinued, give reason: 18:0 3134 3.9 Level 20 1 26.6 120.2 bi < 10 Pump intake set at (m/f) 2 æ 2 18.6 Pumping rate (Vmin (CPM)) 18:0 3 3 28. Well Use Method of Construction ion of pumping hrs + _ _ min 18'0" 4 A. 4 Commercial Not used Cable Tool Diamond T Public Domestic Municipal Dewatering Rotary (Conventional) 5 5 29.4 Rotary (Reverse) Driving Livestock Test Hole Monitoring Boring Final water level end of pumping (mt) Irrigation Cooling & Air Conditioning Digging 10 10 30 Industrial Other, specify Other, specify 15 15 30 If flowing give rate (I/min/GPM) 4 0 **Construction Record - Casing** Status of Well 30 20 20 Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel) Depth (n(ft)) Water Supply Recommended pump depth (mat) Inside Wall Diameter (cm/in) Thickno Replacement Well 25 25 30.9 То 1001 From (cm/in) Test Hole Recommended pump rate 4" 30 Recharge Well (I/min@PM) (S 30 B1. 2577 C 35 101 250 Dewatering Well 40 40 3 Observation and/or Well production (I/min/@PM)) Monitoring Hole 3 20 31. 50 50 Alteration (Construction) Xves 60 B 60 No Abandoned. Insufficient Supply Map of Well Location **Construction Record - Screen** Abandoned, Poor rovide a map below following instructions on e back. Outside Depth (m/ft) Water Quality Material (Plastic, Galvanized, Steel) Diameter (cm/in) Slot No. Abandoned, other, From To specify g ved #1600 Stopecoach Other, specify (NOCIVIC) Stage coach ind ζ Water Details Hole Diameter Depth (m/ft) Water found at Depth Kind of Water: Fresh Untested Diameter C QQ U From (cm/in) (m/ft) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested õ (m/ft) Gas Other, specify Well Contractor and Well Technician Information Well Contractor Well Contractor's Licence No 4P 4168 cipalit Set @ 100 For ood ICHNE 2 Address 6A20 Ministry Use Only Well owner's Audit No. Z408182 information Well Technician (Last Name, First Name) package delivered eren A Date Work Completed Date X NO BNO DIANT 0506F (2020/06) @ Queen's Printer for Ontario, 2 Ministry's Copy

Ontario Melistry of the Environment and Climate Change Well Tag No.: (Messurements recorded in: Zelevic Imperial Concession Add Set CANADA CORP. Concession Concession Concession Concession Add Set CANADA CORP. Concession Concession Concession Concession Concession Concession Concession Concession Concession Outrout Concession Concession Concession Concession Concession Outrout Concession Concession Concession Concession Concession Minicipal Place Monicipal Place Concession Concession Concession Minicipal Place Monicipal Place Monicipal Place Concession Concession Concession Outrout Concernments Concession Concession Concession Concession Concession
Anseuraments recorded in: Zhetric Imperial A 2 0 9 5 5 2 TW B Page
Consistent Number Number Number Number Object Number Object Number Num Number Num Num Number Number Number Number Number Number Number
Addiginal of Way, contervisioned Numper/Name Township Lot Connection County District Mumphing Charles of A Province District Mumphing District Mumphing<
Audige of W_ outling Street NumperName1. Township During Street NumperName1. Lot Concession Counspondent/Mumphing Off TA UV PALY Device Street NumperName Device Numper NumperName Device
Annular Space Results of Well Yield Testing Annular Space Hornol Dappin Set at (m/ti) Type of Secient Used Annular Space Hornol Dappin Set at (m/ti) Type of Secient Used Annular Space Hornol Deptin Set at (m/ti) Type of Secient Used Annular Space Hornol Deptin Set at (m/ti) Type of Secient Used Annular Space Hornol Deptin Set at (m/ti) Type of Secient Used Method of Construction Pure Method of Construction Pure Construction Pure Method of Construction Pure Method of Construction Pure Method of Construction Pure Mater Reservery Pure Method of Construction Pure Method of Construction Pure Mater Reservery Pure Mater Reservery Pure Method of Construction Pure Mater Reservery Pure Mater Reservery Pure Mater Reservery Pure Mater Reserver
Annular Space Results of Well Yield Testing Annular Space Hornol Dappin Set at (m/ti) Type of Secient Used Annular Space Hornol Dappin Set at (m/ti) Type of Secient Used Annular Space Hornol Deptin Set at (m/ti) Type of Secient Used Annular Space Hornol Deptin Set at (m/ti) Type of Secient Used Annular Space Hornol Deptin Set at (m/ti) Type of Secient Used Method of Construction Pure Method of Construction Pure Construction Pure Method of Construction Pure Method of Construction Pure Method of Construction Pure Mater Reservery Pure Method of Construction Pure Method of Construction Pure Mater Reservery Pure Mater Reservery Pure Method of Construction Pure Mater Reservery Pure Mater Reservery Pure Mater Reservery Pure Mater Reserver
Annular Space Results of Well Yield Testing Annular Space Hornol Dappin Set at (m/ti) Type of Secient Used Annular Space Hornol Dappin Set at (m/ti) Type of Secient Used Annular Space Hornol Deptin Set at (m/ti) Type of Secient Used Annular Space Hornol Deptin Set at (m/ti) Type of Secient Used Annular Space Hornol Deptin Set at (m/ti) Type of Secient Used Method of Construction Pure Method of Construction Pure Construction Pure Method of Construction Pure Method of Construction Pure Method of Construction Pure Mater Reservery Pure Method of Construction Pure Method of Construction Pure Mater Reservery Pure Mater Reservery Pure Method of Construction Pure Mater Reservery Pure Mater Reservery Pure Mater Reservery Pure Mater Reserver
OTT /// Conditional Construction Northing Municipal Flags and SubJet Number Other State SubJet Number Other SubJet Number SubJet Nu
NATURE Description Description Black 46 Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form) General Description Descriptio
Overburden and Bedrook Materials/Abandomment Sealing Record (see instructors on the back of this form) Description Description General Colour Most Common Material Other Materials General Description Desc
General Colour Most Common Material Other Materials General Description Depth (mit) General Colour Most Common Material Other Materials General Description 700 302 General Colour Soft 4
Chrow Soft 3.03 7.09 Stery Gravel Boalders Lasse 7.09 13.03 Stery Gravel Boalders Lasse 7.09 13.03 Stery Limestory Isometry Isometry Isometry Isometry Isometry Isometry Depth Set at (m/t) Type of Sealan Used (Maierial and Type) Volume Placed (m/t?) Are yet of vell yield water was: Draw Down Trave Down Recovery A Y2.492 Gail Value Isometry Image Water Level Time Water Level Other, spacify Image Water Level Other, spacify Image Water Level Time Water Level Other, spacify Image Level Other, spacify
Annular Space Hard Boulders Losse 7.09 13.03 Depth Set at (m/ft) Type of Sealant Used (Material and Type) Volume Placed (m ² /ft ²) After jest of Well Yield Testing Depth Set at (m/ft) Type of Sealant Used (Material and Type) Volume Placed (m ² /ft ²) After jest of Well Yield Testing A 4/2.12 Guik Vauto 16 Brg. If pumping discontinued, give reason: Image Value Level Time Value Level (min) Time Value Level (min) Method of Construction Velid Copenercial (Deter specify) Not used (Material and Type) Image Copenercial (Material and Type) Method of Construction Velid Use (Material Copenercial (Material Copenercial Copenercial (Material Copenercial Copenercial (Material C
Annular Space Handle Space Depth Set at (m/ft) Type of Seelant Used (Material and Type) Volume Placed (m/ft) A 42.522 G c. /k Method of Construction // // // // // // // // // // // // //
Annular Space Results of Well Yield Testing Depth Set at (m/h) Type of Sealant Used (Material and Type) Volume Pisced (m/h) A 42.92 G c i k V curts I/G B/AS Method of Construction I/G B/AS I/G B/AS I/G B/AS Method of Construction Well Use I/G B/AS I/G B/AS Cable Tool Diamond Public Construction I/G B/AS Method of Construction Well Use Monipal I/G C/A I/G C/A Method of Construction Pumping discontinued, give reason I/G C/A I/G C/A I/G C/A Method of Construction Pumping discontinued, give reason I/G C/A I/G C/A I/G C/A Method of Construction Pumping discontinued, give reason I/G C/A I/G C/A I/G C/A Method of Construction Pumping discontinued, give reason I/G C/A I/G C/A I/G C/A Method of Construction Public Construction Record - Cosling & Air Conditioning Pumping discontinued, give rate (min/ GPM) I/G C/A I/G C/A Miter spacify Construction Record - Casing Status of Well Puster Love (m/h) I/G C/A
Depth Set at (m/ft) Type of Sealant Used (Material and Type) Volume Placed (m ² /ft ²) After test of well yield, water was: [PClear and sand free] Other, specify Draw Down Recovery A 47.4.42 Act if Material and Type) If BBAG If BBAG Iffice Velocity
Depth Set at (m/ft) Type of Sealant Used (Material and Type) Volume Placed (m ² /ft ²) After test of well yield, water was: []2 Clear and sand free [] Other, specify Draw Down Recovery A 42.42 42
Depth Set at (m/ft) Type of Sealant Used (Material and Type) Volume Placed (m ² /ft ²) After test of well yield, water was: []2 Clear and sand free [] Other, specify Draw Down Recovery A 42.42 42
Depth Set at (m/ft) Type of Sealant Used (Material and Type) Volume Placed (m ² /ft ²) After test of well yield, water was: []2 Clear and sand free [] Other, specify Draw Down Recovery A 42.42 42
Depth Set at (m/ft) Type of Sealant Used (Material and Type) Volume Placed (m ² /ft ²) After test of well yield, water was: [PClear and sand free] Other, specify Draw Down Recovery A 47.4.42 Act if Material and Type) If BBAG If BBAG Iffice Velocity
Depth Set at (m/tr) The indext of a difference of the set of the
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
Method of Construction Well Use Importation of pumping discontinued, give reason Importation depting discontinued, give reason Method of Construction Importation depting discontinued, give reason Method of Construction Import discontinued, give reason Import discontinued, give reason Import discontinued, give reason Import discontinued, give reason Cable Tool Diamond Public Construction Import discontinued, give reason Import discontinued, give reason Import discontinued, give reason Method of Construction Diamond Pumping rate (Immin / GPM) Import discontinued, give reason Import discontinued, give reason Import discontinued, give reason Method of Construction Diamond Pumping rate (Immin / GPM) Import discontinued, give rate (Immin / GPM) Import discontinued, give rate (Immin / GPM) Import discontinued, give rate (Immin / GPM) Micro recruition Record - Casing Industrial Depth (m/ti) Import discontinued, give rate (Immin / GPM) Import discontinued, give rate (Immin / GPM) Note Dopen Hole OR Material Wall Depth (m/ti) Import
Method of ConstructionWell Use2 $G_1 \ Cl_1$ $G_1 \ Sl_2$ Cable ToolDiamondPublicCopenercialNot usedRotary (Conventional)JettingDomesticMunicipalDewateringMathod of ConstructionDiamondPublicCopenercialNot usedRotary (Reverse) All ADrivingLivestockTest HoleMonitoringMaterialDiagingIrrigationCooling & Air ConditioningFinal water level end of pumping (m/th)10Air percussionOther, specifyOther, specifyIt flowing give rate (<i>Vmin / GPM</i>)15 $G_1 \ 75 \ 10 \ 62 \ 74 \ 52 \ 62 \ 74 \ 75 \ 75 \ 75 \ 75 \ 75 \ 75 \ 75$
30.30Method of ConstructionWell UseCable ToolDiamondPublicCopenercialNot usedRotary (Conventional)JettingDomesticMunicipalDeweteringMarciopalDiggingLivestockTest HoleMonitoringBoringDiggingInfigationCooling & Air ConditioningAir percussionOther, specifyOther, specifyConstruction Record - CasingStatus of WellInsideOpen Hole OR MaterialDepth (m/fi)InsideOpen Hole OR MaterialThicknessConcrete, Plastic, Steel)ThicknessConcrete, Plastic, Steel)ThicknessConcrete, Plastic, Steel)The Go Gu Yu, YuStatus of WellReplacement WellMark toolThe Charge WellMark toolThe Charge WellIs Status of WellReplacement WellConcrete, Plastic, SteelG. 4/fConcrete, Plastic, SteelG. 4/f
Method of Construction Well Use Public Construction Construction <th< td=""></th<>
Conventional) Definition Point Operational Notice of pumping Retary (Conventional) Detring Domestic Municipal Dewatering Retary (Conventional) Detring Domestic Municipal Dewatering Retary (Conventional) Digging Livestock Test Hole Monitoring Air percussion Industrial Other, specify Industrial Other, specify Other, specify Other, specify Other, specify It flowing give rate (<i>l/min/GPM</i>) 15 6,75 10 6,474 Inside Open Hole OR Material Wall Depth (<i>n</i> / <i>R</i>) Replacement Well Replacement Well 20 6,75 20 6,74 5 Inside Open Hole OR Material Wall Depth (<i>n</i> / <i>R</i>) Replacement Well 20 6,75 20 6,74 6,75 20 6,74 5 6,74 5 6,75 25 6,74 5 6,74 5 6,75 20 6,75 20 6,75 20 6,75 20 6,75 20 6,75 25 6,75 25 6,75 </td
Image: Construction Record - Casing Depth (m/ft) Depth (m/ft) Depth (m/ft) Inside Diameter (Galvanize, Plastic, Steel) Open Hole OR Material (min/GPM) Depth (m/ft) Depth (m/ft) ISSS Steel O.44 O.60 12, 42, 42 Image: Construction Record - Casing Image: Construction Record - Casing Status of Well Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casing Image: Construction Record - Casi
Air percussion Industrial Industria
Construction Record - Casing Inside Open Hole OR Material Wall Depth (m/ft) Provention Recommended pump depth (m/ft) 20 G, 75 25 G, 76 26 40 J, 75 30 G, 76 40 J, 75 30 G, 76 40 J, 75 30 G, 76 40 J, 76
Inside Diameter (Galvanized, Fibreglass, (<i>cm/in</i>) Wali Thickness (<i>cm/in</i>) Depth (<i>m/it</i>) Image for (<i>min</i>) 15.55 5 + c e l 0.44 0.60 12.42 1 5.55 5 + c e l 0.44 0.60 12.42
15.55 5 + e e l C. 4f 0.60 42.42 Dewatering Well Recommended pump rate (I/min / GPM) 30 C.75 30 C.40 15.55 5 + e e l C.4f O.60 40.42 C.40 40.42 C.40 40.42 C.40
$\frac{15.55}{5.55} = \frac{5+6e1}{5+6e1} \begin{pmatrix} 0.94}{6.60} & 0.60 & 12.92 \\ 0.60 & 12.92 \\ 0 & 0.60$
I Deconction and/or Live a section and a sec
Monitoring Hole Monitoring Hole
(Construction)
Construction Record - Screen
Outside Material Depth (m/fi) Water Quality Please provide a map below following instructions on the back.
(crrvin) (Plastic, Galvanized, Steel) Sho NO. From To Abandoned, other, specify
Other, specify
Water Details Hole Diameter Water found at Depth Kind of Water: Presh Untested Depth (m/ft) Diameter
79. 6 Pri/tt) Gas Other, specify From To (orn/in)
Water found at Depth Kind of Water: Fresh Untested 0 42.42 25.40
(m/ft) Gas Other, specify O GO.GO /5,55
(<i>m/ft</i>) Gas Other, specify Well Contractor and Well Technician Information
(m/ft) Gas Other, specify Well Contractor and Well Technician Information Well Contractor and Well Contractor & Licence No.
(m/ti) Gas Other, specify
(m/t) Gas Other, specify Well Contractor and Well Technician Information Business Name of Well Contractor and Well Technician Information Business Name of Well Contractor and Well Technician Information Business Name of Well Contractor Science No. DXB WATER WELL-Drilling 71526 Business Address (Street Number/Name) 1763 - Roate ECO West MATION Comments:
Province Postal Code Business E-mail Address N K (AA3) GQ West MATION Well owner's Date Package Delivered Ministry Use Only
Image: Construction of the second
Province Postal Code Business E-mail Address Well owner's Date Package Delivered Ministry Use Only Information Date Package Delivered Audit No. 2015

12/18	/2009 16:14	6138383277		RÜCK	PAGE	13/13
ارد سند المجمعان	\$5. · ·	Ministry of	Well Т. А 09360	Jelow)	Well Record legulation 903 Ontario Water Resources Act	
	Mensurements recorded	the Environment	A09360	29	Page Of	
	Well Owner's Inform	Last Nome / Prostan	Fos Develo	E-mail Address	Dy Well Constructed by Well Owner	
	Mailing Address (Stream	uniberName)	Trail Way (province Po	BIJ Code, 'Telephone No. (Inc. profil parlo)	
	Well Location	(Skeet Numper/Name)	C Township	inder 10	Billssecond' B	
	CNO CIVI Coyety/District/Municipi	CLEMPIC	Chyllown/Villege	and and	Province Pasial Code Outario	
	UTM Coordinates Zone	ACTIL KIND	Thunicipal Man and Sublice N		Čther	
	NED 8131 & Overhunden and Bed General Colour 1	Mast Common Material	Bealing Record (see instructions on the be Other Materials	de de trias form) General (Description Erom (nm)	
		and, Gra	vel a bould	2	41/2 180	
		Shert + Edg				
			+	······································		
			<u> </u>			
	 				-DETE PRIMA	
		Annular Space		Re was of year yield we	Public of Well Yield Testing	
	Depth Set at (m(t)) From Te	I ype of Sezient L (Material and Typ	Volume Placed	Cisarpool Gad Her		
	48'10	Next Benton	ntestur × 16.8	if purping discolutioned.	1 33' 1 34'2'	
			·	Pump intake set at (n)	3 21 7" 3	
	Merhod of Go	Diamond Public	Well Use	Pumping Tate (uman ()	4.0'5"	
	Cable Tool Runary (Conventional Recently (Revention)	H) Jening Domesti	* Test Hole U Monitoring	Final water level and of	Rumping (mil) 10 1218" 10	
	Bong	Drugeing Infrastree Industrie Other, s	al specify	If flowing give rate (Um		
		Material Wall Tock Provide State (Mail Tack Provide State (Mail Thickness Martin State (Mail)	Status of Wall Depth (m/l) Overaler Subply From To	Rabommenged pump	25 45 23	
	Dismater (Galveri (cm/m) Corrota	2 Plantic, Bhaol) (cmulin)	From To Toat Hole	Recommended pump	20 455" 30 40 55" 40	
	6'18" OP	nhele - 5	B' BC Montoring Hole	Well production /Umin		
			(Construction)		6044.2" 80 V.	
	Outside	Construction Record - Screen	Depth (77/ft) Wates Quality	Please provide 9 mad	PE BROUE	
	Olemania (condit)	Baivanice(), Swell		Enti		
		Water Details	Hole Dameter		LA CO	
	11 1 10 10	The Kind of Water Fresh 25	Britezted Deptiti (mrif) Diameter From To (envin)		JA O	
	Water found of Dor	th Kind of Water:	- GO INT INT		Arm E	
	Water found at Day (mm) \ (0	While of Water: Fresh in it is contractor and Well To		OV	(b)	
	Business Name ph	Well Contractor	NGGLTDIUS	Contrares		-
	Province	Sired Numberniame)	RICHMOND	- Ce	of Well#5	
	A low	KANTO	Ginician (Last Narros First Name)	paciesge	Percease Deliverso Ministry Use Only Oli Cial Che Z 108216	
	Wint Technoon's Lo	A CA: (O STA	and or Conuscier Data Submitted		Work Completed	
	1348 6505E (12/2007)	440-5	DMinistry's Co		O Cruster (> Proget for Denaido, 20	~

	nistry of the Environment, onservation and Parks	Well Tag No. (Place Sticker a	nd/or Print Below)		Nell Record
easurements recorded in:	Metric Minperial	A09360	9	Regulation 903 Ontario V	
lell Owner's Informati	on				
st Name	Last Name/Organization	Cuando C	E-mail Address	tion	Well Constructed by Well Owner
iling Address (Street Numb	per/Name)	Municipality	Province		e No. (inc. area code)
05-7610	Village Const	herface a	reey 8	NO EAPOC	[\$]]]]
II Location Iress of Well Location (Stre	eet Number/Name)	Township	4	Lot Concess	ion
unty/District/Municipality	gecooch Fo	City/Town/Village	de	Province	Postal Code
Hawa	Corletor	1 area	ely	Ontario	
NAD 8 3 8	TABB POP	Municipal Plan and Suble	ot Number	# 3 °C	
		aling Record (see instructions on th	e back of this form)		
eneral Colour Mos	st Common Material	Other Materials	Gene	nal Description	Depth (m(ft)) From To
EKie	sting 6" ar	iled well -	Atedee	K	0' (80'
4	INCH LINE	R INSTALL	ED 13	SFEET	
	11-24 P41VD				
				<i>i</i> o	
THE S	ratris De	relopment	-Dec. 23	,2009 (Prev	TWS)
	Annular Space	Volumo Bloood	After test of well yield,	Results of Well Yield Testin water was: Draw Dowr	 Produce state and a state of the state of th
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed	Clear and sand fr		evel Time Water Level
35' 65 Pc	ett Plug	(fail	Other, specify If pumping discontinue	Static -	
25'50 Ne	at Ceneur SI	uny 3.9		1 379	
00 10 Fe	21t Plug	2 Pails	Pump intake set at (ng	D 239.8	2 33
ŝ.	0		Pumping rate (Vmin G	PMD 340	3329
Method of Construc	ition	Well Use	20	4 41 7	4 328
Rotary (Conventional)	Jetting Domestic	Municipal Dewatering Test Hole Monitoring	Duration of pumping		5 82.7
Boring	Digging Irrigation	Cooling & Air Conditioning	Final water level end of		7 10324
Air percussion Other, specify	Industrial Other, specify		If flowing give rate (I/min	1 15 1 - 1	15 32
Inside Open Hole OR Ma	tion Record - Casing aterial Wall Depth	(mft) Water Supply	Recommended pump	depth (m/ft) 20 44.	20 31.9
iameter (Galvanized, Fibre cm/in) Concrete, Plastic,	glass, Thickness	To Replacement Well	100'	25 44.	3 25 31.7
1" Plasti	C ,250 135'	Recharge Well	Recommended pump	30 44.5	5 30 31.6
		Dewatering Weil Observation and/or	Well production (I/mik/	PMD 40 44.7	40 31-4
		Monitoring Hole	Disjnfected?	50 44,2	3 50 31.3
		Construction)	Yes No	60 44	7º031.2
and an experimentation of the strategy of the	tion Record - Screen	Insufficient Supply	Disses provide a mor	Map of Well Location	n the backs
outside ameter cm/in) (Plastic, Galvanized	i, Steel) Slot No. Depth	To Abandoned, other,	TIN		(AN)
		specify		1	T
		Other, specify	ste l	600 Stoger Road	bainty
Wa	ter Detalls	Hole Diameter			
	f Water: Fresh Untested	Depth (m/ft) Diameter From To (cm/in)	KNO CIVIC	JEMPINE GIOL	ed &
	f Water: Fresh Untested			1000 -	
Contract Contract	ner, specify f Water: Fresh Untested			#5 0:7 FA	~ 0
	ner, specify		1 27EN		10
	ntractor and Well Technician			14 million	8
	DUI INKCE	Well Contractor's Licence No.			15
siness Address (Street Nun	M L . D.	Municipality	Comments:		
wince Postal C	ode Business E-mail Add	el fichavd	12/4HP-12	Stop Mid	2 100 mg
not Kon	A 220	ast Name First Name	Well owner's Date Information	Mir Audit No	istry Use Only
DODDAN	de) Name of Well Technician (L	ast Name, First Name)	delivered		4081/3
	gnature of Technician and/or Cor		Yes Datewood	22 Int Al	
26 30 interest	r for Operio 200	Miniature's Conv	in the		

0506E (2020/06) © Queen's Printer for Ontario, 2020

Ministry's Copy

Onta	rio 🕅		of the Envir		W T	ag#:/	437894	7 Print Below)			W Dotario Wat		leco
Measuren	nents recorde	ed in: 🗌 N	Metric	Imperial		<u>/</u> 37	8947	TWI		1903 0	Page	er Resi	of
Well Ow	ner's Infor		.ast Name/O	monization				E-mail Addres	¢		Te	7 M/-11 C	Construct
-irst Name	е				Canad			E-mail Addres				by We	II Owner
	ldress (Street 5 - 7610			Jaco		Municipalit	y sel y	Province	Postal Code	000	Telephone N	lo. (inc.	area cod
Vell Loc		village (Jennie r	nate		011			N71	10pq	<u>• </u>		
	f Well Location					Township	loode		Lot 8		Concession	1	
	DO Stage strict/Municipe		030			City/Town/			0	Provi	nce	Postal	Code
Ot	tawa Ca	rleton	N				ely	Number		Ont	ario		
	dinates Zone	-		orthing 5009		Can a	Plan and Sublot	Ance TT			est Well	# C	
Overburd	len and Bed	rock Materia	als/Abando		aling Rec		CONTRACTOR CONTRACTOR	back of this form)				-	h (mt)
General C	-	Most Comm	j			her Materia			eneral Description	1		From	10
	alca 1	cled -) Grav		de de	1.	Boulders	-				35	35 [°]
	& Black			stone V	1, 1	rs Gino		1.00			-	30 186	194
and the second second second second	/ & Black / & Black			stone W stone W	laje	15Gre	Y Sandstor	- BINNE				194	200
Grey			Linie	SCOTTICE W	layer	5 610	1 001102.01	TWE					
										, Sec. 1		_	
courses and the									5 K (1)	11 1/2 1	1.00		Sector Contraction
Depth S	et at (ndi?		Annular Type of Sea	and a second		Volur	ne Placed	After test of well yie	Results of W ld, water was:	Concernation and and	aw Down	Re	covery
From 131	To /		(Material and			(m ³ /O	Clear and san		111	Water Level (m/ft)	Time \ (min)	Nater Le (m/ft)
	0							If pumping discontin		Static Level			60/2
121	0.	Benton	iite slurry	e a constanta da seria da seria. A constanta da seria d		in control on all in	42.00	V		1	28.7	1	41
								Pump intake set at	(n(nft)	2	31.4	2	34
		di Seretta		-				180	~	3	34.9	3	29
	hod of Cons	na nanosina konstantina so			Well Us	esenteren er en		Pumping rate (I/min 20	(GPM)	4	37.7	4	26
Cable To Rotary (0	ool Conventional)	Diamond	Pub		Comme		Dewatering	Duration of pumping	and the second second second second		and the state of the second se	tas paga p	1-1997 (A.C.)
] Rotary (F] Boring	Reverse)	Driving	Live		Cooling	le [& Air Condit		final water level en	The second second second second second	5	40	5	24
Air percu		C 0.999	🗌 Indu	strial		uru oonu		60.21	s of partipling (naid)	10	48.8	10	21
] Other, sp		truction Re		er, specify _		Statu	s of Well	If flowing give rate (I	(min/GPM)	15	50.1	15	18
Inside	Open Hole C	OR Material	Wall		n (m /ft)	Water	Supply	Recommended pur	np depth ((//t))	20	52.5	20	18
Ccm/h	(Galvanized, Concrete, Pla	Fibreglass, astic, Steel)	Thickness (cm/n)	From	To	Repla	cement Well	100r		25	54.2	25	18
61/4"	Steel		.1884	+2/	131'	Recha		Recommended pur (I/min(GPM))	np rate	30	55.4	30	18
14	Open H	lole		1311	200	Obser	vation and/or	Well production (I/m		40	57.1	40	18
6					1.1.1.2.13	Monitera	oring Hole	do		50	58.6	50	18
						(Cons	truction) loned,	Disintected?		60	60.2	60	18
	Cons	truction Re	cord - Scre	en			cient Supply loned, Poor		Map of W	ell Loc	ation		
Outside Diameter	Mate		Slot No.	Depth	The second se	Water	Quality loned, other,	Please provide a n	nap below followi	ng instri	uctions on th	e back.	<u>th</u>
(cm/in)	(Plastic, Galva	nized, Steel)		From	To	specif			C	0	. 7KM		1
		/		>		Other,	specify					2	18
	/			workersteinen				cede #1600	ickke	S	War	{	togecoach Road
later found	d at Depth Ki	Water Deta		htested		h (mft)	Diameter	6					ax
	-	Other, spec		L	From	To	(cm/m)	\$1600			TU)	15
Vater found		nd of Water:		Intested		0/ 13	1 93/44	STAGEC	ortet v	3	40	5	lå
1 1		Other, spec nd of Water:		Untested	4	31 20	0 6"	RAA	A V	×	-94		10
(m.	/ft) 🗌 Gas [Other, speci	ify					port					18
N1	the second second second	Contractor	and Well T	echniciar	WEENGALDER STEREZ	resold Selected and			S)	\bigcirc			店
	ame of Well C ook Drilling					2681	's Licence No.			e			r A A
	eress (Street		10)		Mu	njeipality.	nd I	Comments:		~	\sim	~	D
				-mail Add				140-20	GOME	set	011	20	5
rovince ON		al Code ADA 2ZD	Duamess I	alr-roc	ress k@symp	atico.ca			Package Delivere	d T	Minist	y Use (Only
us.Telepho							11:	information			Audit No. 💙	A () -	001
	ne No. (inc. are	a code) Nam				First Name	, , , , , , , , , , , , , , , , , , , ,	package	2023 M NO			101	30.
613830	82170		Hanna	, Jeremy	1				2023 M M0		Addit No. 🦾	407	33.
613830			Hanna	, Jeremy	/ htractor Dat	e Stopitte		package	-2023 M MO		Received	107	33

Onta	rio 🕅		of the Envir		We	ag#:A378	948		Regulation	903 O			ecord
Measuren	nents recorde	din: 🗌 l	Metric	mperial		A378948		TW E			Page_		of
Well Ow	/ner's Infor	the shows of the second states	1						-				
First Name	9	L	ast Name/O. 69	-	Canada	a Corporation		E-mail Address					onstructed
	ldress (Street I		ne)			Municipality		Province	Postal Code		Telephone N	o. (inc. a	area code)
10: Well Loc	<u>5 - 7610</u> ation	Village (<u>Centre F</u>	<u>'lace</u>		Greely		ON	<u> </u>	<u>nra</u>			
Address of	f Well Location				1	Fownship			Lot 8		Concession 3		
	00 Stage strict/Municipa		(080		(Osgoode City/Town/Village			0	Provin	ICO	Postal	Code
	tawa Ca		bla	atta in a			lot Num	abor	3	Ont	ario		
	dinates Zone	Easting		sob97		Cedar a ke	25 1	haseTU	-)		st Well	#6	
part and part of the second	10 stand the part of the	ock Materi	als/Abando		ling Reco	ord (see instructions on	the back			lan de se			h (m
General C	Colour	Most Comn	non Material			ner Materials		Gen	eral Description			From	20
Grou	& Black			l & Grave stone		4 Bould	Prs					20 (184
	/ & Black	-		stone								184	194
	/ & Black			stone								1941	200 1
						•							
						-							
												-	
				-					Results of We	m vest		an you and a	
Depth S	et at (nutto)		Annular Type of Sea	lant Used		Volume Placed		r test of well yield,	water was:	Dra	aw Down		соvегу
From 131/	To 121 '	Neat c	(Material an ement	d Type)		(m³∰3)' 10.92		Clear and sand Other, specify	ree Not teste	(min)	Water Level (m/ft)	Time V (min)	(m/ft)
121/	0/		nite slurry			54.80	If pu	imping discontinue	ed, give reason:	Static Level	14'3"	alara d	57.84
								X		1	23	1	39.8
							- Pum	np intakle set at (m 180		2	28.5	2	31.6
Met	hod of Cons	truction			Well Us	8	Pum	nping rate (I/min A		3	32.2	3	28
Cable To	ool	Diamond	Put				Dura	20 ation of pumping	ana alamana di sa	4	35.3	4	22.1
Rotary (F	Conventional) Reverse)	Driving		stock [Municipa	e 🗌 Monitoring			and the second	5	37.8	5	19.4
Air percu		Digging	Irrig	Istrial		& Air Conditioning	Fina	l water level end o 57.6	or pumping (m/it)	10	45.5	10	15.2
Other, sp			cord - Cas	er, specify		1 Status of Well	If flo	wing give rate (I/m	in/GPM)	15	49.6	15	14.3
Inside	Open Hole C	R Material	Wall	Depth (m	Vater Supply	Reo	ommended pump		20	51.8	20	14.3
Diameter (cm(in)	(Galvanized, Concrete, Pla		Thickness (cm(in)	From	То	Replacement Well	II Boo			25	53.1	25	14.3
614"	Steel	lena (danganina) Ang dangangan	.188″	+2 1	131 /	Recharge Well		in/GPM)	Idle	30	54	30	14.3
bu	Open H	lole	ana ang ang ang ang ang ang ang ang ang	131	200′	Observation and/or Monitoring Hole	Well	I production (I/min/	(PM)	40	55.2	40	14.3
1.5						Alteration (Construction)	Disir	do		50	56.1	50	14.3 14.34
						Abandoned, Insufficient Supply	K	Yes No		60	57.6	: 60	14.3
Outside	Cons		ecord - Scre	en Depth (ˈm/ft)	Abandoned, Poor Water Quality	Piec	ase provide a ma	Map of We p below following			e back	(MA
Diameter (cm/in)	(Plastic, Galva		Slot No.	From	10	Abandoned, other, specify				0.	7KM		
	-)	Other, specify		. L	15.1	R	in lier	-	2
		/					10	shitat	SKI	F	toeu	1	2
Water foun	d at Dapth	Water Detaind of Water:		Untested		ole Diameter h (n/ft) Diameter							K
184-184 (m		Other, sper		A	From	To (cm/in)		1111-	- 100	KY.			Coact
Water foun	d at Depth Kl	nd of Water: Other, spec		Wintested		0'131'92	#1	# 1600	2 6	~	-80)	50
Water found		nd of Water:		Untested	1	31' 200 Eu		STAGE	coact	t	Titt	6	0
n)	,	Other, spec	r and Well					ROAE	2		-C had	C	8
	lame of Well C	ontractor	r and wen	rechnician		Il Contractor's Licence No							【沃
	ock Drilling		mo)		C	,7681	Com	ments:					t V .
DUSIDESS A	deress (Street	RUBEINA	me)			nieipality, and		107	20.00	AR	DIN	R	2
Province ON		tal Code KOA 220	Business	E-mail Addro air-rock	oss @symp	atico.cs		owner's Date P	ackage Delivere		<u> </u>	y Use	Only
	one No. (inc. are	ea code) Nar		chnician (La			- inform	mation age	2023 M (b		Audit No. Z	107	940
	82170	. Signature		and/or Cont	ractor Dat	e Submitted 10 3	18th	ered Yes					
	ian's Licence No	1 min	All		Y			No Dog	28/10/	3	Received		
0506E (2020/0	16) © Queen's I	Printer for Ontai	io, 2020			Ministry's Cop	1						

00000 (0000/00)	@ Ourses's Delether feel Ostanial
0506E (2020/06)	
, , , , ,	© Queen's Printer for Ontario,

PRIVATE WELL RECORDS

Ontario	Ministry of the Environment and Climate Change	Well Tag No. (Place Sticker and/or Print Below)	1
Measurements recorded	in: 🗌 Metric 🕅 Imperial	A229133	Regulation 9

Well Record

903 Ontario Water Resources Act Page___ _ of _

Address of	Well Loca	tion (Street Nur	nber/Name)		Te	ownship	1	_ot		Concession		
<u> </u>	4 Ceda trict/Munic	i <mark>rlakes \A/:</mark> Sipality	ay		c	Osgoode ity/Town/Village		P/L 7	Provin		Posta	l Code
	Sinates Zo			orthing		Grocky Iunicipal Play and Sublo	t Number		Ont: Other	ario		
NAD	83.	lo lidok	ok	Ishnbo		***			~ "	100		
				onmentse	aling Reco	rd (see instructions on th	e back of this form)		-SIL	16-2		_
General C	olour	Most Comr	non Materia		Oth	er Materials	General	Description			Dep From	oth (<i>m7tb)</i> ∣ To
			Sand	& Grave							n (10 1
Grey			Limes								• 19 ′	83 1
Grey			Sands		WIE	any Limeston						
						ineston	e				83	107 '
<u>Grey</u>			Sand		· · · · · · · · · ·						<u>107 </u>	186
<u>Grey</u>			Sand	stone					··		188	192
			Annula	Space			Re	sults of We	ell Yiel	d Testing		
Depth Se From	et at (<i>m/@</i> To		Type of Se (Material a	alant Used		Volume Placed	After test of well yield, wa		Dra	aw Down Water Level		ecovery
131 /	121 /	Neat ce							(min)	vvater Level (m/ft)	(min)	Water Level (m/ft)
						10.9	If pumping discontinued,	give reason:	Static Level	29:5	,	46.5"
121	0'	Bentoni	te slurry			33.6	X		1	*	1	
							Pump intake set at (mm)		2	37.2		33.7
							180			40.8	2	31.4
Meti	hod of C	onstruction			Well Use	÷	Pumping rate (Vmin / GPM	Ø	3	42.5	3	30.8
Cable To		Diamono			Commer	and a second	20 Duration of pumping		. 4	43.6	4	30.4
Rotary (C		al) 🗌 Jetting		omestic	Municipa		hrs +min		5	44.3	5	30.2
Boring		Digging		gation		Air Conditioning	Final water level end of pu		10		10	
Air percu Other, sp	ission hecify			dustrial her, <i>specify</i>			48'5 "			45.8		29.5
		onstruction R				Status of Well	If flowing give rate (Vmin /	GPM)	15	46.1	15	29.5
Inside	1	ole OR Material	Wall	The second s	h (<i>m</i> 🕖	Water Supply	Recommended pump der	nth (m@	20	46.1	20	29.5
Diameter (cm/fo	(Galvani Concrete	zed, Fibreglass, e, Plastic, Steel)	. Thickness	From	То	Replacement Well		00'	25	46.2	25	29.5
1 110		,	()	(Test Hole	Recommended pump rati		30		30	
0 14-	Steel		.188	+2'	131'	Dewatering Well	20		40	46.3	40	28.5
<u> </u>	Open	Hole		131	192	Observation and/or Monitoring Hole	Well production (I/min / 🍕	±₽		48.4		29.5
						Alteration (Construction)	20 Disinfected?		50	48.5	50	29.5
						Abandoned,	🛛 🖓 🖓 s 🗆 No		60	46.5*	60	28.5 "
	¢	onstruction R	ecord - Sci	reen	-1	Insufficient Supply Abandoned, Poor		Map of We				
Outside Diameter		Vaterial Salvanized, Steel)	Slot No.	Dept	h (<i>m/ft</i>)	Water Quality	Please provide a map b	elow followir	ng instru	uctions on th	ne back	
(cm/in)	(Flaslic, G	aivanizeu, Steel)	-~	From	То	specify			~			1
							4	+179	14			
		\mathcal{C}				Other, specify	05	DAD	LA	KES		
		Water Det	ails	<u></u>	H	ole Diameter	CE	*179 DAR WA		I		6
Water found	-		: 🗍 Fresh			(<i>m/ft</i>) Diameter		WA	7			X
100	1⁄ @ □ Ga	Of and		<u> </u>	From	To (cm/in)			ţ	_	_	$ \mathbf{Y} \rangle$
Water found	oat Deptn 1/ft) ⊡ Ga:			Untested	' <u> </u> ε	131 974)	1 g
		Kind of Water		Untested	134	192' 6"					*	10
(m	t/ft) ⊡Ga	s 🗌 Other, <i>spe</i>	cify				180	\swarrow	. 6	r KW		2
		Vell Contracto	or and Well	Technicia								Stage Conel
		ell Contractor				Contractor's Licence No.					I	ち
		n <mark>g Co. Ltd.</mark> reet Number/Na	ime)			1 [9	Comments:				4/01	
8659 Fi	ranktów	n Road, RR				ichmond	3/4 HP 15 GPM	SETAT	100 5	FET	I	
Province	1	Postal Code	Business	s E-mail Add								
	ne No. //	KOA 2ZO . area code) Na	me of Woll 7		@sympat		information	age Delivere	112	Minist Audit No. 🍞		hoor on contrast and all products
Bus. relepho		. area codej Na				nsuvame)	package delivered			AUUI, NO. 2	27	6745
Well Technici	an's Licenc	e No. Signature	of Technicia	Jeremy in and/or Ce	ontractor Date	Submitted	Yes Date Work	Completed	[_]	OCT 2	3 21)18
13632	2	<u> </u>			Y	₩ŶŶŶ Ŷ Ϻ ʹϺ ϐʹϲ		₽ <u>~</u> <u>0</u> 9 <u>%</u> 4	3.9			
0506E (2014/1	11)	7-				Ministry's Copy				© Queen's	Printer fo	r Ontario, 2014

7 -----

0

Onta	rio 🕅		the Environme on and Parks	™ [Tag	g#:A30	5058	Print Belo	w) Regulation	903 ()			ecord
Measurem	ents record	ed in: 🗌 Met	ric Amperia	ı 📃	A305058	5				Page		of
Address of	Well Locatio	n (Street Numbe	r/Name)		ownship			Lot	1	Concessio	n	
1820		lakes Wav	,		Os good a Dity/Town/Villag				P/L Provin	<u>7</u>	Bostal	Code
Otta	awa Car	leton			Greely				Ont			
UTM Coord NAD	dinates Zone			belae ∣^	/unicipal Pla/i a 4M-15F	1	Ohar i	2)	Other	20-2		
Overburd General C	en and Bec		/Abandonmen	Sealing Reco			Eback of this for	n) General Description		20-2	Dept	h (m ff)
General C		Wost Common				oulders		General Description			From	16'
Grey			Sand Limestone			ouiders					16 '	115 1
Grey			Limestone	w/Gr	ey Sar	nd si	me M	řγς			115 1	171
Grey			Limestone	_w/G	Ney Sa	nds	store r	wp			171	177 177
Grey			Sandstone		-						<u>177</u>	234 /
Grey			Sandstone				1				234	240
							· · · · · · · · · · · · · · · · · · ·					
Depth Se	et at (m 😰		Annular Space		Volume P	Haçed I	04005491470000000000000000000	Results of Wi Il yield, water was:	Provide stability	d Testing aw Down	Re	covery
From 131	To 121 1		laterial and Type		(m³/¶¥	<u>م</u>	Clear and		Time (min)	Water Leve (m/ft)	el Time ' (min)	Water Level (m/ft)
121 '	01	Bentonite			25.2		If pumping disc	continued, give reason:	Static Level	4.3	'	154.5
	-							<u> </u>	1	26.3	1	111
							Pump intake s 220	et at (n/ft)	2	36.2		101
PERMIT AND A COMPLEX COMPLEX	a deserve and it is the second second second second	Istruction			e		Pumping rate (l/min / CPM)	3	44.8		92.6
Cable To	ol Conventional)	Diamond	Bublic Comestic	Comme	_	ot used ewatering	18 Duration of pu		4	52.5	+_+	84.4
Bong (F	Reverse)	Driving Digging	Livestock	Test Hol Cooling	e 🛄 M & Air Conditionin	onitoring G		el end of pumping (6)(1)	10	54.3 85.3		
	ussion St	IPGE	Other, spec	:лу		_	154 [°] .	3" ate (Vmin/GPM)	15	102	15	25
	T		ord - Casing	-	Status of Water Sup	the stream site igent site		C	20	113	20	15.2
Inside Diameter (cm/60)	(Galvanize	OR Material d, Fibreglass, T Plastic, Steel)	Wall I hickness (cm	Depth (m/ f)) п То	Replacem		Recommende	d pump depth (mff)	25	121	25	14.3
61/4"	Steel		.188″ +2	1311	Test Hole Recharge		Recommende (I/min CPM)	d pump rate	30	126	30	14.3
515/16	^{//} Open H	lole	13	1′ 240′	Dewatering	on and/or	18 Well production	n (l/min©PM)	40	136	40	14.3
<u>2 µ</u> 2					Monitoring		18 Disinfected?		50	146	50	14.3
					Abandone	d,			60	154	3 60	14.3"
Outside	1	torial	ord - Screen	Depth (m/ft)	Abandone Water Qua	d Poor	Please provid	Map of W e a map below followi			the baok	(4+
Diameter (cm/in)		vanized, Steel)	Slot No. From	то То	Abandone specify	d, other,		17			Ģ	
		$-\mathcal{Z}$			Other, spe	cify		# (8,	26			
inanis dan kancantakan fi bada								TAP 11	1/4			R
Water foun		Pole development of the party of the second	s]Fresh ∏⊉ nte	sted Dep	Hole Diameter th (m66) □ [□ To □	Diameter (cm/00)		WAY	\ \			$ \langle$
171 (m Water foun		Other, specify Kind of Water:		From		93/1		WAY			\frown	a a
		Other, specify Kind of Water:			31 2401	515/16	r				,	0 V
Water foun (n		Other, specify						_			21	gecoach
	We lame of Well		and Well Techn		ion Il Contractor's Li			FT L		-5K	$h \downarrow$	đ_
Air Ro	ick Drilling	g Co. Ltd.	<u></u>		7681		139	▷ \ () `			[(1
		et Number/Name) Road			nicipality Richmond		Comments:	150005	Z 1	Θ	ر م_ ا	ন্থ
Province QN	Po	stal Code KDA 2Z0	Business E-mai air-	l Address rock@sympa	atico.ca		Well owner's	Date Package Deliver	<u>, 1997</u>		Stry Use	Only
Bus.Teleph			e of Well Technici	ian (Last Name,			information package delivered		DIA	Audit No.	z34	4113
Well Technic	ian's Licence	No. Signature of	Hanna, Jere Technician and/c	or Contractor Da	te Submitted 1	1 30	(Yy)	Date Work Completed	11	11	N A 8	2021
T363	2	's Printer for Ontario	my from	Y	Ministry	M D D	No	YYYYMM	DD	Received	₩3-8 -7	LUL1
		O	V									

leasurements re	rio Minis the E		Imperial	1	A144728	<u></u>		l		Page	ater Res	of
Nell Owner's		T	<u> </u>					•				
irst Name			/ Organizatio			E-m	nail Address			· [Construct ell Owner
Address (S	Street Number/Na		<u>illium Ho</u>		Municipality	Prov	vince	Postal Code)	Telephone		
	Pierre Road	<u> </u>			Vars		ON	KOA	BHD			
Vell Location	ocation (Street Nu	umber/Name	3)	1	Township			Lot		Concessio	on	
	darlakes W	lay			Osgooode City/Town/Village	digitisees aanaanaa		PIL	7 Provi	3	Posta	I Code
County/District/Mu					, ,				Ont	tario		
	Carleton Easting		Northing		Greeiv Municipal Plan and Sub	lot Number	۶r		Other			
NAD 8 3 Verburden and	19 453 Bedrock Mater	Station and and and and and and and and and an	50098 Ionment Se		4M-1479 ord (see instructions on th	e back of th	nis form)		∟s/I	L 29		
General Colour	Most Com	mon Materia	al	Ot	her Materials		Gene	ral Descriptior	1		Dep From	oth (mt) To
		Boul	ders	4	Sand+Cl	ау	1.1.1.1.1				0	28'
Grey	<u>palang apablikan</u> nang Standard	Lime	stone	anana tananga	n. Karangan di Karangan di Kar		a depa	1. 1. 1. <u>1</u>	<u></u>	agaa jaan ji	26 (188
Grey		Lime	estone	an a	et e se s		and program.	an a		adalah sa	188'	190
Brown			dstone	Rhysenner -		<u> </u>	e, and he are		in dael	Surgers	190	255
Brown			dstone	10			ingene Gerennetten i	<u>ene postatilitzan</u>	andiyadiy.		255	260
Brown			dstone (dstone	2010	<u>کم Limesto</u> می Limesto				<u>unning</u> waantat	gerkelen på det vilse och Jaholen anderen	_260 [′] _293 [′]	293 [°] 300 [°]
		teer fait i fle		~101	ey Limesto				e guerra de la composition de la compos La composition de la c			
												-
			r Space		1			Results of Wo			and the second	
Depth Set at (mg From To		Type of Se (Material a	ealant Used and Type)		Volume Placed		t of well yield, v ar and sand fr		Time	raw Down Water Leve		ecovery Water Lev
131 ' 12'	I' Neat c	ement			7.8-7	and the second	er, specify	Not tester	(<i>min</i>) Static	(m/ft)	(min)	(m/ft)
121 0					a haran ya y a kanjerisi	I n pumpi	ng discortande	u, give reason.	Level	23.6	Solar period	48
121 0	Bentor	nite slurry	line in the		29.4		V/		1	3	1	- mm +
121 0	Bentor	nite slurry			29.4	Pump in	take set at (n	Ð	1	307	1	28/3
	Bentor	nte slurry			29.4	2	80		2	34.7	2	28;: 24,(
Method of	Construction	-		Well Us	Se	Pumping	80 g rate (l/min /		2	307 34.7 35.5	2	28;3 24,1 23.6
Method of] Cable Tool] Rotary (Convention	Construction		ublic	Comme	Se Proceeding International I	Pumping Duration	80 g rate (<i>Ilmin</i> /€ 0 ∩ of pumping	SEM)	2 3 4	36.6	2 3 4	28,3 24,(23,(23,(
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring	Construction		ublic	Comme Municip	Se Proceeding International I	Pumping 2 Duration	280 g rate <i>(llmin /</i> √ 20 n of pumping ^{hrs +} 0_m	SEM)	2 3 4 5		2 3 4 5	28; 24,1 23,0 23,0
Method of] Cable Tool] Rotary (Convention] Rotary (Reverse)	Construction		ublic omestic vestock	Comme Municip	se ercial Dewatering ble Monitoring	2 Pumping 2 Duration <u>1</u> Final wat	BD g rate (<i>Ilmin</i> / C C o of pumping hrs + m ter level end of B	in pumping (m/ft)	2 3 4 5 10	36.6 37.6 37.4	2 3 4 5 10	28; 24,1 23,0 23,0
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Doring Air percussion Other, specify	Construction Diamon		ublic omestic vestock igation dustrial ther, <i>specify</i> _ sing	Comme Municip Test Ho Cooling	se ercial Dewatering le Monitoring & Air Conditioning Status of Well	2 Pumping 2 Duration <u>1</u> Final wat	BD g rate (<i>Ilmin</i> / CD n of pumping hrs + m ter level end of	in pumping (m/ft)	2 3 4 5 10 15	36.6 37.6 37.4 40,3	2 3 4 5 10 15	28; 24,1 23,1 23,1
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Air percussion Other, specify Inside Open Diameter (Galva	Construction Diamon Diamon Diamon Diy Diy Digging Construction R Hole OR Material nized, Fibreqlass,	ecord Car Wall	ublic omestic vestock igation dustrial ther, <i>specify</i> _ sing Depth	Comme Municip Test Hc Cooling	se ercial Not used pal Dewatering be Monitoring & Air Conditioning	Pumping Pumping Duration Final wat If flowing	BO g rate (<i>IImin</i> / CO o of pumping hrs +O m ter level end of B g give rate (<i>IIm</i>	in ipumping (m/ft) in / GPM)	2 3 4 5 10 15 20	36.6 37.6 37.4	2 3 4 5 10 15 20	28; 24,1 23,1 23,1
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Other, specify Inside Diameter (Galva Concert	Construction Diamond Diamond Digging Digging Construction R Hole OR Material nized, Fibreglass, ate, Plastic, Steel)	d Pu Liv Liv Co Co Co Co Co Co Co Co Co Co Co Co Co	ublic omestic vestock igation dustrial ther, <i>specify</i> _ sing Depth From	Comme Municip Test Hc Cooling		21 Pumping 21 Duration Final wat 1f flowing Recomm	g rate (<i>IImin</i> / c c c c c c c c c c c c c	in pumping (m/lt) in I GPM) depth (n(tt)	2 3 4 5 10 15 20 25	36.6 37.6 37.4 40,3	2 3 4 5 10 15 20 25	28; 24,(23,(23,(
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Dirr percussion Other, specify Inside Canton Concert Co	Construction Diamon Diamon Diamon Diamon Diamon Digging Digging Construction R Hole OR Material Hole OR Material Real	d Pu Liv Liv Brind Cot Cot Cot Cot Cot Cot Cot Cot Cot Cot	ublic omestic vestock igation dustrial ther, <i>specify</i> _ sing Depth From	Comme Municip Test Hc Cooling	Se rcial Not used bal Dewatering be Monitoring & Air Conditioning Status of Well Replacement Well Replacement Well Recharge Well Dewatering Well	Pumping 2 Duration <u>1</u> Final wat 4 If flowing Recomm (<i>limi</i> / 4 2	BO g rate (IImin / O O o of pumping hrs + m ter level end of B g give rate (IIm M nended pump	in pumping (m/it) in / GPM) depth (n(it) rate	2 3 4 5 10 15 20 25 30	36.6 37.6 37.4 40,3	2 3 4 5 10 15 20 25 30	282 24.1 23.1 23.1
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Dirr percussion Other, specify Inside Canton Concert Co	Construction Diamond Diamond Digging Digging Construction R Hole OR Material nized, Fibreglass, ate, Plastic, Steel)	d Pu Liv Liv Co Co Co Co Co Co Co Co Co Co Co Co Co	ublic omestic vestock igation dustrial ther, <i>specify</i> _ sing Depth From	Comme Municip Test Hc Cooling		Pumping 2 Duration 4 Final wat 4 If flowing Recomm (<i>limin</i> / 2 Well proc	BO g rate (IImin / O o of pumping hrs +m ter level end of g give rate (IIm ended pump for ded pump duction (IImin	in pumping (m/it) in / GPM) depth (n(it) rate	2 3 4 5 10 15 20 25 30 40	36.6 37.6 37.4 40,3	2 3 4 5 10 15 20 25 30 40	287: 24.1 23.1 23.1
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Dirr percussion Other, specify Inside Canton Concert Co	Construction Diamon Diamon Diamon Diamon Diamon Digging Digging Construction R Hole OR Material Hole OR Material Real	d Pu Liv Liv Co Co Co Co Co Co Co Co Co Co Co Co Co	ublic omestic vestock igation dustrial ther, <i>specify</i> _ sing Depth From	Comme Municip Test Hc Cooling	Se rccial Not used hal Dewatering he Monitoring & Air Conditioning Status of Well Status of Well Air Conditioning Replacement Well Becharge Well Observation and/or Monitoring Hole Alteration (Construction)	2 Pumping 2 Duration 1 Final wat 1 f flowing Recomm (<i>Imin</i> / ≪ 2 Well proc	g rate (IImin / g rate (IImin / n of pumping hrs + m ter level end of g give rate (IImin nended pump duction (IImin 0 0	in pumping (m/it) in / GPM) depth (n(it) rate	2 3 4 5 10 15 20 25 30 40 50	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.9	2 3 4 5 10 15 20 25 30 40 50	28:2
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Dirr percussion Other, specify Inside Canton Concert Co	Construction Dlamon Dlamon Dlamon Dlamon Dlamon Dlamon Dirving Digging Construction R Hole OR Material nized, Fibreglass, ste, Plastic, Steel) C Plan Dlamon	ecord - Cas Wall Thickness (cm/in) ',	ublic omestic vestock igation dustrial ther, <i>specify</i> _ sing Depth From +2 ' 131 '	Comme Municip Test Hc Cooling	Se rcial Not used bal Dewatering be Monitoring be Monitoring be Monitoring be Monitoring be Monitoring be Not used be Not	Pumping 2 Duration 4 Final wat 4 If flowing Recomm (<i>limin</i> / 2 Well proc	g rate (IImin / g rate (IImin / n of pumping hrs + m ter level end of g give rate (IImin nended pump duction (IImin 0 0	in ipumping (m/lt) in / GPM) depth (n(tt) rate	2 3 4 5 10 15 20 25 30 40 50 60	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48.	2 3 4 5 10 15 20 25 30 40	
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Other, specify Inside Diameter Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Conc	Construction Diamond Diamond Dial) Disting Dirving Digging Construction R Hole OR Material nized, Fibreglass, ate, Plastic, Steel) The Hole Construction R Material Material	ecord - Scre	ublic omestic vestock igation dustrial ther, <i>specify</i> sing Depth From +2 131	Comme Municip Test Hc Cooling	Se rcial Dewatering De Monitoring Air Conditioning Status of Well Replacement Well Recharge Well Dewatering Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor Water Quality	2 Pumping 2 Duration 4 Final wat 1 f flowing Recomm (<i>limin</i> / ≪ 21 Well proc 21 Well proc 21 Disinfecte × Yes	280 g rate (IImin / 20 n of pumping hrs +m ter level end of 8 g give rate (IImin 9 give rate (IImin 0 duction (IImin 0 ed? No	in pumping (m/it) in / GPM) depth (n(it) rate	2 3 4 5 10 15 20 25 30 40 50 60	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48 ation	2 3 4 5 10 15 20 25 30 40 50 60	
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Other, specify Inside Diameter Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Calva Concret Conc	Construction Diamon Construction R Diamon Di	ecord - Cas Wall Thickness (cm/in) ',	ublic omestic vestock igation dustrial ther, <i>specify</i> sing Depth From +2 131	Comme Municip Test Hc Cooling (m/ft) To 131 ´ 300 ´	Se Prcial Not used Prcial Dewatering Prcial Dewatering Prevent Supply Status of Well Water Supply Replacement Well Dewatering Well Deservation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, Poor	2 Pumping 2 Duration 4 Final wat 1 f flowing Recomm (<i>limin</i> / ≪ 21 Well proc 21 Well proc 21 Disinfecte × Yes	280 g rate (IImin / 20 n of pumping hrs +m ter level end of 8 g give rate (IImin 9 give rate (IImin 0 duction (IImin 0 ed? No	in i pumping (m/lt) in / GPM) depth (n(ff)) rate	2 3 4 5 10 15 20 25 30 40 50 60	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48. ation	2 3 4 5 10 15 20 25 30 40 50 60	
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Boring Other, specify Inside Diameter Calva Concert Calva C	Construction Diamond Diamond Dial) Disting Dirving Digging Construction R Hole OR Material nized, Fibreglass, ate, Plastic, Steel) The Hole Construction R Material Material	ecord - Scre	ublic omestic vestock igation dustrial ther, <i>specify</i> sing Depth From +2 131	Comme Municip Test Hc Cooling	Se Prcial Not used Prcial Dewatering Prcial Dewatering Prcial Dewatering Prcial Dewatering Prcial Prcial Prciad Prcial Prcial Pr	2 Pumping 2 Duration 4 Final wat 1 f flowing Recomm (<i>limin</i> / ≪ 21 Well proc 21 Well proc 21 Disinfecte × Yes	g rate (IImin / 4 g rate (IImin / 4 c 0 o of pumping hrs + _ 0 m ter level end of g give rate (IImin g give rate (IImin duction (IImin ed? No rovide a map b	in pumping (m/ft) in / GPM) depth (n(ff)) rate / EM) Map of We pelow following	2 3 4 5 10 15 20 25 30 40 50 60 80 1 Loc	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48. ation ons on the b	2 3 4 5 10 15 20 25 30 40 50 60	
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Conters specify Inside Diameter Callet Control	Construction Diamon Diamon Diamon Diamon Diamon Diamon Digging Construction R Hole OR Material nized, Fibreglass, ste, Plastic, Steel) P Construction R Material Getwanized_Steely	ecord - Scre	ublic omestic vestock igation dustrial ther, <i>specify</i> sing Depth From +2 131	Comme Municip Test Hc Cooling (<i>m/ft</i>) To 131 (<i>m/ft</i>) To (<i>m/ft</i>) To	Se Percial Not used Percial Dewatering Percial Monitoring Percial Mo	2 Pumping 2 Duration 4 Final wat 1 f flowing Recomm (<i>limin</i> / ≪ 21 Well proc 21 Well proc 21 Disinfecte × Yes	g rate (IImin / 4 g rate (IImin / 4 c 0 o of pumping hrs + _ 0 m ter level end of g give rate (IImin g give rate (IImin duction (IImin ed? No rovide a map b	in pumping (m/ft) in / GPM) depth (n(ff)) rate / EM) Map of We pelow following	2 3 4 5 10 15 20 25 30 40 50 60 80 1 Loc	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48. ation ons on the b	2 3 4 5 10 15 20 25 30 40 50 60	
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Other, specify Inside Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Concert Cable Cable Concert Cable	Construction Diamon Dia	ecord - Scre	ublic omestic vestock igation dustrial ther, <i>specify</i> sing Depth From +2 131	Comme Municip Test Hc Cooling (<i>mlft</i>) To 300 ((<i>mlft</i>) To	Se Prcial Not used Prcial Dewatering Prcial Dewatering Prcial Dewatering Prcial Dewatering Prcial Not used Prcial Dewatering Prcial Not used Prcial Dewatering Prcial D	2 Pumping 2 Duration 4 Final wat 1 f flowing Recomm (<i>limin</i> / ≪ 21 Well proc 21 Well proc 21 Disinfecte × Yes	g rate (IImin / 4 g rate (IImin / 4 c 0 o of pumping hrs + _ 0 m ter level end of g give rate (IImin g give rate (IImin duction (IImin ed? No rovide a map b	in pumping (m/ft) in / GPM) depth (n(ff)) rate / EM) Map of We pelow following	2 3 4 5 10 15 20 25 30 40 50 60 80 1 Loc	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48. ation ons on the b	2 3 4 5 10 15 20 25 30 40 50 60	
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Other, specify Inside Concer Calva Concer Calva Concer Con	Construction Diamon Dia	ecord - Cas Wall Thickness (cmin) .188 ecord - Scre Slot No.	ublic omestic vestock igation dustrial ther, <i>specify</i>	Comme Municip Test Hc Cooling (<i>mlft</i>) To 300 ((<i>mlft</i>) To	Se Prcial Not used Not use	2 Pumping 2 Duration 4 Final wat 1 f flowing Recomm (<i>limin</i> / ≪ 21 Well proc 21 Well proc 21 Disinfecte × Yes	g rate (IImin / 4 g rate (IImin / 4 c 0 o of pumping hrs + _ 0 m ter level end of g give rate (IImin g give rate (IImin duction (IImin ed? No rovide a map b	in pumping (m/ft) in / GPM) depth (n(ff)) rate / EM) Map of We pelow following	2 3 4 5 10 15 20 25 30 40 50 60 80 1 Loc	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48. ation ons on the b	2 3 4 5 10 15 20 25 30 40 50 60	ed leave A
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Other, specify Inside Diameter Carlet Diameter Control Control Carlet Control Control Carlet Control	Construction Diamon Diamon Diamon Diamon Diamon Digging Construction R Hole OR Material nized, Fibreglass, ste, Plastic, Steel) Construction R Material Getwanized_Steel/ Water Det Material Getwanized_Steel/ Construction R Material Construct	ecord - Scre	ublic omestic vestock igation dustrial ther, specify sing Depth From +2 131 131 2000 From	Comme Municip Municip Test Hc Cooling (m/ft) To 131 (m/ft) To m Dept From G	Se Protial Not used Protial Dewatering Protial Dewatering Protional Dewatering Protional Protinal Protinal Protional Protional Protional Prot	2 Pumping 2 Duration 4 Final wat 1 f flowing Recomm (<i>limin</i> / ≪ 21 Well proc 21 Well proc 21 Disinfecte × Yes	g rate (IImin / 4 g rate (IImin / 4 c 0 o of pumping hrs + _ 0 m ter level end of g give rate (IImin g give rate (IImin duction (IImin ed? No rovide a map b	in i pumping (m/lt) in / GPM) depth (n(ff)) rate	2 3 4 5 10 15 20 25 30 40 50 60 80 1 Loc	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48. ation ons on the b	2 3 4 5 10 15 20 25 30 40 50 60	et les
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Other, specify Inside Other, specify Inside Other, specify Outside Diameter (Calva Concr (Galva (Concr (Galva Concr (Galva (Concr (Galva (Concr (Galva (Concr (Galva (Concr (Galva (Concr (Galva (Concr (Galva (Concr (Galva (Concr (Galva (Concr (Galva (Concr (Galva (Concr (Galva (Concr (Galva (Construction Diamon Dia	ecord - Cas Wall Thickness (cmin) .188 ecord - Scre Slot No.	ublic omestic vestock igation dustrial ther, specify sing Depth From +2 131 131 2000 From	Comme Municip Municip Test Hc Cooling (m/ft) To (m/ft) To (m/ft) To H Dept From	Se Protial Not used Protial Dewatering Protial Dewatering Protional Dewatering Protional Protinal Protinal Protional Protional Protional Prot	2 Pumping 2 Duration 4 Final wat 1 f flowing Recomm (<i>limin</i> / ≪ 21 Well proc 21 Well proc 21 Well proc	g rate (IImin / 4 g rate (IImin / 4 c 0 o of pumping hrs + _ 0 m ter level end of g give rate (IImin g give rate (IImin duction (IImin ed? No rovide a map b	in pumping (m/ft) in / GPM) depth (n(ff)) rate / EM) Map of We pelow following	2 3 4 5 10 15 20 25 30 40 50 60 80 1 Loc	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48. ation ons on the b	2 3 4 5 10 15 20 25 30 40 50 60	et les
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Conter, specify Inside Other, specify Inside Control Co	Construction Diamon Diamon Diamon Diamon Diamon Diamon Diamon Diamon Digging Construction R Hole OR Material Getvanized Steel Water Def th Kind of Water as Other, spe th Kind of Water as Other th Kind of Water as Other th Kind of Water as Other th Kind of Water th Kind th	ecord - Cas Wall Thickness (cmin) .188 ecord - Scre Slot No. Slot No.	ublic omestic vestock igation dustrial ther, specify_ sing Depth From +2 ' 131 ' 131 ' Depth From Depth From	Comme Municip Test Hc Cooling (<i>m/ft</i>) To 131 (<i>m/ft</i>) To (<i>m/ft</i>) To H Dept From 6	Se Prcial Not used bal Dewatering be Monitoring & Air Conditioning Status of Well Vater Supply Replacement Well Dewatering Well Dewatering Well Dewatering Well Dewatering Well Dewatering Well Dewatering Well Doservation and/or Monitoring Hole Alteration (Construction) Abandoned, Poor Water Quality Abandoned, other, specify Other, specify Other, specify 0 ther, specify 131 9 ³ /4" 300 5 ⁷ /8"	2 Pumping 2 Duration 4 Final wat 1 f flowing Recomm (<i>limin</i> / ≪ 21 Well proc 21 Well proc 21 Well proc	g rate (IImin / 4 g rate (IImin / 4 c 0 o of pumping hrs + _ 0 m ter level end of g give rate (IImin g give rate (IImin duction (IImin ed? No rovide a map b	in pumping (m/ft) in / GPM) depth (n(ff)) rate / EM) Map of We pelow following	2 3 4 5 10 15 20 25 30 40 50 60 80 1 Loc	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48. ation ons on the b	2 3 4 5 10 15 20 25 30 40 50 60	et les
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Other, specify Inside Other, specify Inside Other, specify Outside Diameter (Calva Concr (Galva (G	Construction Diamon Dia	ecord - Cas Wall Thickness (cmin) .188 ecord - Scre Slot No. Slot No.	ublic omestic vestock igation dustrial ther, specify_ sing Depth From +2 ' 131 ' 131 ' Depth From Depth From	Comme Municip Municip Test Hc Cooling (<i>m/ft</i>) To 131 (<i>m/ft</i>) To (<i>m/ft</i>) To H Dept From C A31	Se Prcial Not used bal Dewatering be Monitoring & Air Conditioning Status of Well Vater Supply Replacement Well Dewatering Well Dewatering Well Dewatering Well Dewatering Well Dewatering Well Dewatering Well Doservation and/or Monitoring Hole Alteration (Construction) Abandoned, Poor Water Quality Abandoned, other, specify Other, specify Other, specify 0 ther, specify 131 9 ³ /4" 300 5 ⁷ /8"	2 Pumping 2 Duration 4 Final wat 1 f flowing Recomm (<i>limin</i> / ≪ 21 Well proc 21 Well proc 21 Well proc	g rate (IImin / 4 g rate (IImin / 4 c 0 o of pumping hrs + _ 0 m ter level end of g give rate (IImin g give rate (IImin duction (IImin ed? No rovide a map b	in pumping (m/ft) in / GPM) depth (n(ff)) rate / EM) Map of We pelow following	2 3 4 5 10 15 20 25 30 40 50 60 80 1 Loc	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48. ation ons on the b	2 3 4 5 10 15 20 25 30 40 50 60	32,00 V 600 10000000
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Other, specify Inside Diameter Concre	Construction Diamon Digging Construction R Hole OR Material Replastic, Steel Construction R Material Gevanized Steel Water Det Kind of Water as Other, spe th Kind of Water as Other as Othe	ecord - Car Wall Thickness (cm/in) , 188 ecord - Scre Slot No. Slot No. slot No.	ublic omestic vestock igation dustrial ther, specify_ sing Depth From +2 ' 131 ' 131 ' Depth From Depth From	Comme Municip Municip Test Hc Cooling (m/ft) To 131 ' 300 ' (m/ft) To H Dept From G M91 M9	Se Prcial Not used Prcial Dewatering Prcial Dewatering Prcial Dewatering Prcial Dewatering Prcial Prcial Prciae Pr	Pumping 2 Duration 1 Final wat 4 If flowing Recomm (<i>limin</i> / ◀ Well proc 20 Well proc Please pr	PBD grate (IImin / Q D of pumping hrs + m ter level end of 8 g give rate (IImi 2 g give rate (IImi 2 d duction (IImin 0 ed? No rovide a map t	in pumping (m/ft) in / GPM) depth (n(ff)) rate / EM) Map of We pelow following	2 3 4 5 10 15 20 25 30 40 50 60 Bill Locc	36.6 37.6 37.4 40.3 41.5 42.7 43.7 45.4 46.7 48. ation ons on the b	2 3 4 5 10 15 20 25 30 40 50 60	et les
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Air percussion Other, specify Inside Carrow Control Carrow Carow Carrow Carrow Carrow Carow Carrow Carrow Carrow	Construction Diamon Dia	ecord - Cas Wall Thickness (cm/in) 1 1 1 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	Jublic omestic vestock igation dustrial ther, <i>specify</i> _ sing Depth From +2 131 131 1 200 From Depth From	Comme Municip Municip Test Hc Cooling (m/ft) To 131 ' 300 ' (m/ft) To 131 ' 300 ' 1160rmat We Mu	Se Prcial Not used Prcial Dewatering Net used Nonitoring Status of Well Status of Well Water Supply Replacement Well Dewatering Well Abandoned, poor Water Quality Abandoned, other, specify Other, specify Sole Diameter To I an 9344 Solo Contractor's Licence No.	Pumping 2 Duration 1 Final wat 3 If flowing Recomm (<i>limin</i> / 2 Well proc 2 Disinfecte X Yes Please pr	PBD grate (IImin / Q D of pumping hrs + m ter level end of 8 g give rate (IImi Added pump C d d duction (IImin ed? No rovide a map t	in pumping (m/ft) in / GPM) depth (n(ff)) rate / EM) Map of We pelow following	2 3 4 5 10 15 20 25 30 40 50 60 60 60 811 Loc instructi	36.6 37.6 37.4 40.3 41.5 42.1 43.7 45.4 46.7 48. ation cons on the the second seco	2 3 4 5 10 15 20 25 30 40 50 60	ed leave A
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Air percussion Other, specify Inside Cameric Carlor Concer Carlor Concer Carlor Concer Carlor Carlor Concer Carlor Concer Carlor Concer Carlor Concer Carlor Concer Carlor Concer Carlor Concer Carlor Concer Carlor	Construction Diamon Dia	ecord - Cas Wall Thickness (cm/in) 1 1 1 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	Jublic omestic vestock igation dustrial ther, <i>specify</i> sing Depth From +2 ' 131 ' 131 ' 2000 Depth From Depth From Depth From Comparison From Comparison Secon	Comme Municip Test Hc Cooling (m/ft) To 131 ' 300 ' (m/ft) To (m/ft) To H Pept From 0 131 1	Se Prcial Not used Prcial Dewatering Prcial Dewatering Prcial Dewatering Prcial Dewatering Prcial Prcial Pr	Pumping 2 Pumping 2 Duration 4 If flowing Recomm Recomm (<i>Imin</i> / ≪ 20 Well proc 20 Well proc 20 Please pr	BD g rate (IImin / Q D of pumping hrs + m ter level end of 8 g give rate (IImin 9 G d duction (IImin 0 ed? □ No Tovide a map to 15 √ √ HP - 15 G	Map of We below following BALLA below following CALLA below following	2 3 4 5 10 15 20 25 30 40 50 60 60 81 Loc 60 81 Loc 81 Loc	36.6 37.6 37.4 40.3 41.5 42.1 43.7 45.4 46.7 45.4 46.7 45.7 7 5 7 7 7 7 7 7 7 7 7 7 7	2 3 4 5 10 15 20 25 30 40 50 60	Theyer of her A
Method of Cable Tool Rotary (Convention Rotary (Reverse) Boring Air percussion Other, specify Inside Carrow Control Carrow Carow Carrow Carrow Carrow Carow Carrow Carrow Carrow	Construction Diamon Diamon Diamon Diamon Diamon Diamon Diamon Diamon Digging Construction R Hole OR Material Revenized Steel Waterial Revenized Steel Water Det th Kind of Water as Other, spe th Kind of Water as Other	ecord - Cas Wall Thickness (cmin) .188 ecord - Scre Slot No. Slot No.	ublic omestic vestock igation dustrial ther, specify	Comme Municip Municip Test Hc Cooling (m/ft) To 131 (m/ft) To (m/ft) To H Dept From H Dept From Mul ess @\$\$ympa	Se Prcial Not used And Dewatering And Conditioning Status of Well Becharge Well Dewater Supply Replacement Well Dewatering Well Abandoned, Poor Water Quality Abandoned, other, specify Other, specify Iole Diameter To Ion Contractor's Licence No. 1119 Incipality Richmond Stico.ca	Pumping 2 Duration 1 Final wat 3 If flowing Recomm (<i>limin</i> / 2 Well proc 2 Disinfecte X Yes Please pr	BD g rate (IImin / Q D of pumping hrs + m ter level end of g give rate (IImin g give rate (IImin Q d duction (IImin Q ed? novide a map t CEE1 (IS) HP - 15 G n Date Page	in pumping (m/lt) in / GPM) depth (n(1)) rate / CEM) Map of Wee pelow following CALLA SO ALLA	2 3 4 5 10 15 20 25 30 40 50 60 60 60 60 81 Loc 60 81 Loc 84 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	36.6 37.6 37.4 40.3 41.5 42.1 43.7 45.4 46.7 45.4 46.7 45.7 7 5 7 7 7 7 7 7 7 7 7 7 7	2 3 4 5 10 15 20 25 30 40 50 60	They have a have

Ministry's Copy

Measurem			ry of		N	ം പ്രം പ്രം	Print Below)					Recor
	ents reco	the En	vironment ^{Netric}	Imperial		A144727	R	egulation	903 (Dntario Wa Page_	ter Res	of
Address of 1851	Well Loca 8 Ced	ition (Street Nur Ariakes W	nber/Name) a y)		^{Township} Osgoode	Lot	P/L 7		Concession]	
County/Dis		cipality arleton				City/Town/Village			Provir Ont		Posta	Code
UTM Coordi	inates Zo	ne Easting 18 4534		orthing		Municipal Plan and Subl 4M-1479	lot Number		Other		entered and a second	
NAD Overburde	in the second		فتتنا بتخلط ومراجب	خبار فيشاب	با بينيات تنبا بسيدات	ord (see instructions on the	e back of this form)		-0/1	_ 30		
General Co	olour	Most Comm			Ot	ner Materials	General D	escription			From	
			Sand		- •	Clay Boulders					0.1	11' 29'
Grey			Lime		4	Douber					29 /	1801
Grey			Lime				-				1801	1901
	8. White	n an	Sand	stone							190 '	248 '
Grey &	& White		Sand	stone							248′	294 (
Grey &	& White	ination and an anna an an Rainneadh fa dh'sann agus	Sand	stone	ar jeda e se a	en e		in an an an a'	<u></u>	<u>Chilanna</u>	294 '	300'
Depth Sc	otat (mm_1))		Annular	5		Volume Placed	Resu After test of well yield, water			d Testing	B	ccovery
From 132	To 122	Neat ce	(Material ar		- states stars - k	(<i>m</i> ³ /@)	Clear and sand free	tested	Time	· · · · · · · · · · · · · · · · · · ·		
122/	0/	in delle secolo di	ite slurry			50.4	Other, specify		Static	25-5"	1	29.81
1 Do des		Paul No. 1, 10, 107 1 11		and the second	na del por construcción 			e in grander	Level	28.7	· ···	25.
							Pump intake set at (mft)		2	29.1	2	25.0
n. Les parties							280 Pumping rate (Ilmin I GPM)	an chi tao ka ka	3	29.3	3	25.
Meth	USENIAMO DE DE LA DECENIA DE LA DECENIA	onstruction	- Pu	blic	Well Us			e (Messeerer	4	29.4	4	25.0
 Rotary (C	Convention	al) 🗌 Jetting	Xo	mestic	🗌 Municip	al 🗌 Dewatering	Duration of pumping 1 hrs + 0 min	ang series and series of the	5	29.4	5	25.5
Boring		Driving	🗌 Irri	0	Cooling	le Monitoring & Air Conditioning	Final water level end of pum	iping (m/ft)	10	29.5	10	25.5
Air percu				lustrial her, <i>specify</i>	,		29.8 '	DIA1	15	29.5	10	25.
	C	onstruction Re	ecord - Cas	sing		Status of Well		3PM)	20	29.6	20	25.
Inside Diameter (cmm)	(Galvani	ole OR Material zed, Fibreglass,	Wall Thickness	1	oth (<i>m/ft</i>)	Water Supply	Recommended pump dept	th (n @	20	29.6	25	25.
(cmm)	Concrete	e, Plastic, Šteel)	(cm/in) .188 [*]	From	To 132'	Test Hole	100 Recommended pump rate	e tradicione () Presidente ()	30	29.6	30	25.
04"		Hole	. 100	132	300	Recharge Well Dewatering Well	(Ilmin I 2000)		30 40	29.7		25.
5">[16"	hau			132	000	Observation and/or Monitoring Hole	Well production (Ilmin I @	44		29.8	40	25.8
÷.,					_	Alteration (Construction)	Disinfected?		50	29.8	50	25.5
ANIMAGE CONTRACTOR						Abandoned, Insufficient Supply	XCYes No		60		60	۰۰ کی بند
Outside	I	Construction Re		T	oth (<i>m/ft</i>)	Abandoned, Poor Water Quality	N Please provide a map below	lap of We v following i		******************************	ack.	
Diameter (cm/in)		ialvanized, Steel)	Slot No.	From	То	Abandoned, other, specify					à	
							#185	58	-<	2	1	
						Other, specify	H185 CEDAR WAN	LAK	to	2		J
		Water Det				lole Diameter	USA'	1		and the second		8
		Kind of Water		X Unteste	d Dep From	th (<i>m/ft</i>) Diameter To (<i>cm/in</i>)			_	ing the second s	7	Agencel for
Vater found	d at Deptl	n Kind of Water	: 🗌 Fresh	XUnteste	a marine a state				.51	KM		23
148 (m		S Other, spece			d 132	2 300 5 5 15/16	120'	-	-			8
	Ga:											1 de
Vall94ound		Vell Contracto	r and Well	Technici		tion ell Contractor's Licence No.						15
/a 194 ound		ng Co. Ltd.				1119						100
Va 194 ound Prad (mi usiness Na	ok unni	wet New Ber/New	的時別		Μι	Rightitrond	Comments: 3/4 HP - 15 GPM	ISET	400			
Va 194 ound Air Ro		*** * * * * * * * * * * * * * * * * *					11		5 8 Y 19 1	F-1		
Vall94ound (mi usiness Na Air Ro usiness	idenr(81		Business	E-mail Ac	idress	atico ca			; 100	FI		
Val94ound usiness Na Air Ro ustress rovince	daur (Si	Postal Code			ldrass ck@symp		Well owner's Date Packag		1	Minist	try Use	Only
Val94ound usiness Na Air Ro ustress rovince	HANKIN ne No. (inc	Postal Code	me of Well T		(Last Name,		information package	Q.5	1	Minist Audit No.		
Val94ound Rusiness Na Air Ro Rusiness Na Air Ro Ro Ro Ro Ro Ro Ro Ro Ro Ro	19998 (8) Ine No. (inc 12170	Postal Code	me of Well T Hanna	rechnician , Jerem	(Last Name, V Contractor Da	First Name)	package 2014	Q.5	1	Minist Audit No.		2 Only 2 0 7 2 0 14

Do	Intario) Minist	try of wironment		Tw.	ag#: A1354	56 'rint Below)					lecord
	nents recor	the Er		mperial		A133430		Regulation	n 903 C	Page	er Kes	ources Act of
	mer's Info	mation	17. antik	Brier - Deblar, Stranger				There are a				
First Name	9		Last Name	Drganizatic BUICK &	⁶ Franc	es Muldoon	E-mail Address					Constructed all Owner
Mailing Ad	dress (Stree 7320	Blue Wat				Municipality Greely	Province	Postal Code	oc	Telephone N		
Well Loc		ion (Street Nu	mbor/Name)					Lot -	17-17-194(1)) (1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	Concession		
Address	22 Ced	arlakes	mber/Name)		-	Township Osgoode		P/L	7	J		
County/Dis	strict/Munici	pality Carleton				City/Town/Village Greely	·		Provin Onta		Postal	Code
UTM Coord	dinates Zon	e Easting	3176 No	rthing 5009		Municipal Plan and Sub 4M-1479	ot Number		Other	/L38		
	83	and and the f			1 1 1	ord (see instructions on th	e back of this form)			a sa	i ante Di	The states and
General C	1		non Material	1		her Materials	Gene	ral Description	1		From	th (matt) To
			Sano		clay	- Boulde	rs -		-		0	29
Grey				estone dstone							29 1	180
Grey				dstone		ang dan series and a series of the series	· · · · · · · · · · · ·				180	220
Grey				dstone							220	
Whil				dstone							254	280
						an a						
												1
			Annular	Space	a significantes			Results of We	JI Yieli	d Testino i	and an	
	et at (mt)	1	Type of Seal	lant Used	- -	Volume Placed	After test of well yield,	water was:	Dra	aw Down	R	ecovery
131	To 121	Neat	(Material and cement	u rype)		(m@) 10.9	Clear and sand f	Not test	(inin)	Water Level (mitt)	(min)	Water Level (mift)
121	0	Bento	nite slurry	1		42	If pumping discontinue	ed, give reason:	Static Level	18		18.6
						+	X	<u> </u>	1	16.3	1	13
	1	1	and the second				Pump intake set at (r 250-	₩£	2	16.3	2	13
							200					
	hod of Co	nstruction	anna <mark>c</mark> hraidhean	ast a thom	Wall II			<u>GPN</u>)	3	16.3	3	13
Cable To	loo	nstruction			Well U	ercial 🗌 Not used	Pumping rate (Ilmic)	<u>GPN</u>)		16.3 16.3	3	13 13
Cable To	ool Conventional	Diamono	i Pub	nestic	a second state of the second state	ercial Dewatering	Pumping rate (lime) 20 Duration of pumping hrs.+	nin	3 4 5		4	
Cable To Rotary (Rotary (Boring	ool Conventional Reverse)	Diamono Jetting	Live	nestic estock ation	Comm Municip	ercial Dewatering	Pumping rate (Ilmic)	nin	3 4 5	16.3 18.3 18.4	4	13 13 13
Cable To Rotary (Rotary (ool Conventional Reverse) ussion pecify	Diamono Diamono Jetting Driving Digging	Live	nestic estock ation ustrial er, specify	Comm Municip Test H Cooling	ercial I Not used hal Dewatering ble Monitoring g & Air Conditioning	Pumping rate (lime) 20 Duration of pumping hrs.+	nin If pumping <i>(mitt</i>)	3 4 5	16.3 18.3 18.4 18.4	3 4 5 10 15	13 13
Cable To Rotary (I Rotary (I Boring Air perce Other, sp	ool Conventional Reverse) ussion pecify Co	Diamono Jetting Driving Digging	Live	nestic estock ation ustrial er, specify	Comm Municip Test H Cooling	arcial Not used bal Dewatering ble Monitoring a & Air Conditioning Status of Well	Pumping rate (Imin) 20 Duration of pumping 1hrs + 0r Final water level end of 16.8- If flowing give, rate (Im	nin f pumping (mill) nin I GPM)	3 4 5 10	16.3 18.3 18.4	3 4 5 10 15	13 13 13
Cable To Rotary (I Rotary (I Boring	ool Conventional Reverse) ussion pecify Co Open Hol (Galvanize	Diamono Diamono Jetting Driving Digging	Live	nestic estock ation ustrial er, specify	Comm Municip Test H Cooling	arcial Not used bal Dewatering ble Monitoring g & Air Conditioning Status of Well Vytater Supply Replacement Well	Pumping rate (limit) 20 Duration of pumping hrs. + Final water level end of 16.8	nin f pumping (mill) nin I GPM)	3 4 5 10 15	16.3 18.3 18.4 18.4	3 4 5 10 15 20	13 13 13 13
Cable To Rotary (I Rotary (I Boring Air perco Other, sp Inside Diameter	ool Conventional Reverse) ussion pecify Co Open Hol (Galvanize	Diamond Diating Driving Digging Digging	ecord - Cas	nestic estock ation ustrial er, specify ing Dept	Comm Munici Test H Cooling	arcial Not used bal Dewatering ble Monitoring g & Air Conditioning Status of Well Water Supply Replacement Well Test Hole Recharge Well	Pumping rate (Ilmin 20 20 Duration of pumping 1/rs, + 0/ Final water level end of 18.6 If flowing give rate (Illi Recommended pump 100	nin f pumping (mill) nin / GPM) o depth (nfff)	3 4 5 10 15 20	16.3 18.3 18.4 18.4 18.4	3 4 5 10 15 20 25	13 13 13 13 13 13
Cable To Rotary (I Rotary (I Boring Air perco Other, sp Inside Diameter	ool Conventional Reverse) ussion pecify Open Hol (Galvaniz Concrete, Stee	Diamond Diating Driving Digging Digging	Vall Thickness (cmtD)	nestic estock lation ustrial er, <i>specify</i> Dept From	Comm Munici Test H Cooling h (m) To 131	Arcial Not used bal Dewatering ble Monitoring & Air Conditioning Status: of Well Vater Supply Replacement Well Test Hole Recharge Well Dewatering Well Dewatering Well Dewatering well	Pumping rate (Imin 1 20 Duration of pumping 1ns, + 0r Final water level end of 16.6 If flowing give, rate (III Recommended pump (Imin I G20) priv	nin f pumping (m/lt) nin / GPM) o depth (na) o rate	3 4 5 10 15 20 25	16.3 16.3 16.4 16.4 16.4 16.4	3 4 5 10 15 20 25 30	13 13 13 13 13 13
Cable To Rotary (I Rotary (I Boring Air perco Other, sp Inside Diameter	ool Conventional Reverse) ussion pecify Open Hol (Galvaniz Concrete, Stee	Diamon Diamon Diating Driving Digging Digging construction R e OR Material d, Fibreglass, Plastic, Steel)	Vall Thickness (cmtD)	nestic estock ation ustrial er, <i>specify</i> Dept From +2 4	Comm Munici Test H Cooling h (m) To 131	Arcial Not used bal Dewatering ble Monitoring & Air Conditioning Status: of Well Water Supply Replacement Well Test Hole Case Well Dewatering Well	Pumping rate (Ilmic) 20 Duration of pumping 1/rs + 0r Final water level end of 18.8 If flowing give rate (Illi Recommended pump 190 Recommended pump (Ilmin / G20 Well production (Ilmin 20 +	nin f pumping (m/lt) nin / GPM) o depth (na) o rate	3 4 5 10 15 20 25 30	16.3 18.3 18.4 16.4 16.4 16.5 , 16.5	3 4 5 10 15 20 25 30 40	13 13 13 13 13 13 13 13
Cable To Rotary (I Rotary (I Boring Air perco Other, sp Inside Diameter	ool Conventional Reverse) ussion pecify Open Hol (Galvaniz Concrete, Stee	Diamon Diamon Diating Driving Digging Digging construction R e OR Material d, Fibreglass, Plastic, Steel)	Vall Thickness (cmtD)	nestic estock ation ustrial er, <i>specify</i> Dept From +2 4	Comm Munici Test H Cooling h (m) To 131	arcial Not used bal Dewatering ble Monitoring & Air Conditioning Status: of Well Water Supply Replacement Well Chearyae Well Dewatering Well Cobservation and/or Monitoring Hole	Pumping rate (Imin 1 20 Duration of pumping 1ns, + 0r Final water level end of 16.6 If flowing give, rate (III Recommended pump 100 Recommended pump (Imin I G20) priv	nin f pumping (m/lt) nin / GPM) o depth (na) o rate	3 4 5 10 15 20 25 30 40	16.3 18.3 16.4 16.4 16.4 16.4 16.5 16.5 16.5	4 5 10 15 20 25 30 40 50	13 13 13 13 13 13 13 13 13 13
Cable To Rotary (1 Rotary (1 Boring Other, sj Inside Diameter (cmtg) 6 1/4	ool Conventional Reverse) ussion pecify Con Open Hol (Galvaniz Concrete, Steel	Diamon Diamon Diating Driving Digging Digging construction R e OR Material d, Fibreglass, Plastic, Steel)	Vall Thickness (cmff) .188	nestic istock jation istrial er, specify ing Dept From +2 4 131	Comm Munici Test H Cooling h (m) To 131	Arcial Not used bal Dewatering ble Monitoring a & Air Conditioning Status: of Well Replacement Well Recharge Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction)	Pumping rate (Ilmin 20 20 Duration of pumping 1rs.+ 0r Final water level end of 18.6. If flowing give rate (Ilmin 100' Recommended pump (Ilmin / G20) Recommended pump (Ilmin / G20) Well production (Ilmin 20+ Disinfected? X-Yes No	nin If pumping (m/ti) nin / GPM) o depth (rate o rate nate nate Map of W/	3 4 5 10 15 20 25 30 40 50 60 ell Loc	16.3 16.4 16.4 16.4 16.4 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (1 Rotary (1 Boring CitAir percu Other, sp CitAir percu Other, sp CitAir percu Other, sp CitAir percu Other, sp CitAir percu Citareter (Criffe) Cother, sp Citareter (Criffe) Citareter Citare	ool Conventional Reverse) ussion pecify Con (Galvaniz Concrete, Steel , Oper	Diamon Diamon Diating Diating Driving Digging Distruction R oR Material d, Fibreglass, Plastic, Steel) Hole onstruction R aterial	Vall Thickness (cmff) .188	nestic istock iation istrial er, specify From +2 131 en Dept	Comm Munici Munici Test H Cooling To To 131 280 h (m(ft))	Actional Construction Abandon ad Apandon ad	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0r Final water level end of 16.6 If flowing give, rate (Illi Recommended pumpi 100 Recommended pumpi (Ilmin / G20) privil Well production (Ilmin 20 + No Please provide a map	nin / GPM) nin / GPM) o depth (nm) o rate o GPUD Map of W/ below following	3 4 5 10 15 20 25 30 40 50 60	16.3 16.4 16.4 16.4 16.4 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (I Rotary (I Boring Cl.Air perce Other, s Diameter (cmtty) 6'/4'' 5'5/16"	ool Conventional Reverse) ussion pecify Con (Galvaniz Concrete, Steel , Oper	Diamono Diamono Diating Driving Driving Digging Distruction R Armanial A	ecord - Cas	nestic stock ation strial er, specify From +2 131	Comm Munici Munici Test H Cooling To To 131 280	arcial Not used bal Dewatering ble Monitoring & Air Conditioning Status: of Well Status: of Well Replacement Well Recharge Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Jons Insufficient Supply Databased Nater Replacement Mell Diservation and/or Monitoring Hole Alteration (Construction) Abandoned, Poor Water Quality	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0r Final water level end of 16.6 If flowing give, rate (Illi Recommended pumpi 100 Recommended pumpi (Ilmin / G20) privil Well production (Ilmin 20 + No Please provide a map	nin / GPM) nin / GPM) o depth (nm) o rate o GPUD Map of W/ below following	3 4 5 10 15 20 25 30 40 50 60	16.3 16.4 16.4 16.4 16.4 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (1 Rotary (1 Boring CitAir percu Other, sp CitAir percu Other, sp CitAir percu Other, sp CitAir percu Other, sp CitAir percu Citareter (Criffe) Cother, sp Citareter (Criffe) Citareter Citare	ool Conventional Reverse) ussion pecify Con (Galvaniz Concrete, Steel , Oper	Diamon Diamon Diating Diating Driving Digging Distruction R oR Material d, Fibreglass, Plastic, Steel) Hole onstruction R aterial	ecord - Cas	nestic istock iation istrial er, specify From +2 131 en Dept	Comm Munici Munici Test H Cooling To To 131 280 h (m(ft))	arcial Not used bal Dewatering ble Monitoring & Air Conditioning Status of Well Vater Supply Replacement Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Insufficient Supply Abandoned, other,	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0r Final water level end of 16.6 If flowing give, rate (Illi Recommended pumpi 100 Recommended pumpi (Ilmin / G20) privil Well production (Ilmin 20 + No Please provide a map	nin / GPM) nin / GPM) o depth (nm) o rate o GPUD Map of W/ below following	3 4 5 10 15 20 25 30 40 50 60	16.3 16.4 16.4 16.4 16.4 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (1 Rotary (1 Boring CitAir percu Other, sp CitAir percu Other, sp CitAir percu Other, sp CitAir percu Other, sp CitAir percu Citareter (Criffe) Cother, sp Citareter (Criffe) Citareter Citare	ool Conventional Reverse) ussion pecify Con (Galvaniz Concrete, Steel , Oper		ecord - Scree	nestic istock iation istrial er, specify From +2 131 en Dept	Comm Munici Munici Test H Cooling To To 131 280 h (m(ft) To To	arcial Not used bal Dewatering ble Monitoring 9 & Air Conditioning Status: of Well Status: of Well Status: of Well Dewatering Well Dewatering Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Poor Water Quality Abandoned, other, specify Other, specify	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0r Final water level end of 16.6 If flowing give, rate (Illi Recommended pumpi 100 Recommended pumpi (Ilmin / G20) privil Well production (Ilmin 20 + No Please provide a map	nin / GPM) nin / GPM) o depth (nm) o rate o GPUD Map of W/ below following	3 4 5 10 15 20 25 30 40 50 60	16.3 16.4 16.4 16.4 16.4 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (I Rotary (I Boring) Clair perce Other, s Clair perce Cable Diameter (cmtg) Clair Clai	ool Conventional Reverse) ussion pecify Open Hol (Galvanzy Concrete, Steel , Oper , Oper (Plastic, Ge	Diamon	ecord - Cas Wall Thickness (cmg) .188 ecord - Scree Slot No.	nestic stock jation istrial er, specify From +2 4 131 an Depti From	Comm Munici Munici Test H Cooling To To 131 260 h (m/R) To To Dep	arcial Not used bal Dewatering ble Monitoring 8 Air Conditioning Status of Well Vater Supply Replacement Well Dewatering Well Dewatering Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, poor Water Cuality Abandoned, other, specify Other, specify Hole Diameter th (m/ft) Diameter	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0r Final water level end of 16.6 If flowing give, rate (Illi Recommended pumpi 100 Recommended pumpi (Ilmin / G20) privil Well production (Ilmin 20 + No Please provide a map	nin If pumping (m/ti) nin / GPM) o depth (rate o rate nate nate Map of W/	3 4 5 10 15 20 25 30 40 50 60	16.3 16.4 16.4 16.4 16.4 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (I Rotary (I Boring Cabler To Boring Cabler To Cabler To Cab	ool Conventional Reverse) ussion pecify Con Open Hol (Galvanize Concrete, Steel , Oper (Plastic, Ga	Diamono Diamono Digging Driving Digging Restruction R ad, Fibreglass, Gribreglass, Plastic, Steel) Hole Material Wanized, Steel) Water Die Kind of Wate	ecord - Cas Wall Thickness (cmt) .188 ecord - Scree Slot No.	nestic stock jation istrial er, specify From +2 131 eri Depti From From	Comm Munici Munici Test H Cooling To To 131 260 from from Deg From	arcial Not used bal Dewatering ble Monitoring & Air Conditioning Status: of Well Vytater Supply Replacement Well Dewatering Well Observation and/or Monitoring Hole Ateration (Construction) Abandoned, poor Water Quality Abandoned, other, specify Other, specify th (m/lf) Diameter To Control Control Control Construction)	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0r Final water level end of 16.6 If flowing give, rate (Illi Recommended pumpi 100 Recommended pumpi (Ilmin / G20) privil Well production (Ilmin 20 + No Please provide a map	nin / GPM) nin / GPM) o depth (nm) o rate o GPUD Map of W/ below following	3 4 5 10 15 20 25 30 40 50 60 60 ell Locc RLA	16.3 16.4 16.4 16.4 16.4 16.4 16.5 16.6 16.6 16.6 16.6 16.6 16.6 16.6	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (I Rotary (I Boring Cabir perce Other, s Other, s Inside Diameter (cmtg) Collection Collection Diameter (cmtg) Collection Diameter (cmtg) Collection Diameter (cmtg) Collection Collec	ool Conventional Reverse) ussion pecify Con (Galvanizi Concrete, Steel Open Hol (Galvanizi Concrete, Steel Open (Plastic, Ga M (Plastic, Ga d at Depth m (Calvanizi Concrete, Steel Concrete, Galvanizi Galvanizi Concrete, Galvanizi Concrete, Concrete, Concrete, Concrete, Concrete, Concrete, Concrete, Concre	Diamono Diamono Digging Driving Digging Restruction R ad, Fibreglass, Plastic, Steel) Hole Mater Die Kind of Wate Other, spe Kind of Wate	ecord - Cas Wall Thickness (ang) .188 ecord - Scree Slot No.	nestic stock alion strial er, specify From +2 131 en Dept From Pert From	Comm Munici Munici Test H Cooling To To 131 260 from m(m/t) To Dei From Lat	arcial Not used bal Dewatering ble Monitoring g & Air Conditioning Status: of Well Wyater Supply Replacement Well Dewatering Well Deseration and/or Monitoring Hole Alteration (Construction) Abandoned, Poor Water Quality Abandoned, other, specify Other, specify Other, specify th (m/it) Diameter To (cm/in) 131	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0 Final water level end of 18.8 If flowing give rate (Ilmin Recommended pumping Ilmin I G20 PA Well production (Ilmin Disinfected? Say I No Please provide a map	nin / GPM) nin / GPM) o depth (nm) o rate o GPUD Map of W/ below following	3 4 5 10 15 20 25 30 40 50 60	16.3 16.4 16.4 16.4 16.4 16.4 16.5 16.6 16.6 16.6 16.6 16.6 16.6 16.6	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (I Rotary (I Boring Cable To Rotary (I Boring Cable To Rotary (I Boring Cable To Boring Cable To Cottes (Cable Cable To Cottes (Cable Cable To Cottes (Cable To Cable To Cottes (Cable To Cottes (Cable To Cottes (Cable To Cottes (Cable To Cable To C	ool Conventional Reverse) ussion pecify Open Hol (Galvanizz Concrete, Steel , Oper (Plastic, Ge (Plastic, Ge d at Depth) (Galvanizz Concrete, Steel , Oper (Galvanizz Concrete, Steel , Oper (Galvanizz Concrete, Steel , Oper ,	Diamono Diamono Digging Driving Digging Restruction R ad, Fibreglass, Plastic, Steel) Hole Material Ivanized, Steel) Water Die Kind of Wate Other, spe Kind of Wate	ecord - Cas Wall Thickness (antip) .188 ecord - Scree Slot No.	nestic stock alion strial er, specify From +2 131 en Dept From Pert From	Comm Munici Munici Test H Cooling To To 131 260 from m(m/t) To Dei From Lat	arcial Not used bal Dewatering ble Monitoring & Air Conditioning Status: of Well Vytater Supply Replacement Well Dewatering Well Observation and/or Monitoring Hole Ateration (Construction) Abandoned, poor Water Quality Abandoned, other, specify Other, specify th (m/lf) Diameter To Control Control Control Construction)	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0r Final water level end of 16.6 If flowing give, rate (Illi Recommended pumpi 100 Recommended pumpi (Ilmin / G20) privil Well production (Ilmin 20 + No Please provide a map	nin / GPM) nin / GPM) o depth (nm) o rate o GPUD Map of W/ below following	3 4 5 10 15 20 25 30 40 50 60 60 ell Locc RLA	16.3 16.4 16.4 16.4 16.4 16.4 16.5 16.6 16.6 16.6 16.6 16.6 16.6 16.6	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (1 Rotary (1 Boring Citar perci- Cother, sp Citar perci- Cothe	ool Conventional Reverse) ussion pecify Concrete, Steel Open Hol (Galvaniz Concrete, Steel Concrete, Concr	Diamond Diamond Diamond Digging Driving Digging Antroduction R a OR Material od, Fibreglass, Plastic, Steel) Plastic, Steel) Natical N	ecord - Cas Wall Thickness (cratter) .188 ecord - Scree Slot No.	nestic stock jation strial er, specify From +2 131 en Depti From From	Comm Munici Munici Test H Cooling To To 131 Cooling from from I31	arcial Not used bal Dewatering ble Monitoring g & Air Conditioning Status: of Well Wyater Supply Replacement Well Dewatering Well Deseration and/or Monitoring Hole Alteration (Construction) Abandoned, Poor Water Quality Abandoned, other, specify Other, specify Other, specify th (m/it) Diameter To (cm/in) 131	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0 Final water level end of 18.8 If flowing give rate (Ilmin Recommended pumping Ilmin I G20 PA Well production (Ilmin Disinfected? Say I No Please provide a map	nin / GPM) nin / GPM) o depth (nm) o rate o GPUD Map of W/ below following	3 4 5 10 15 20 25 30 40 50 60 60 ell Locc RLA	16.3 16.4 16.4 16.4 16.4 16.4 16.5 16.6 16.6 16.6 16.6 16.6 16.6 16.6	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (1 Rotary (1 Boring Citar perci- Cother, sp Citar perci- Cothe	ool Conventional Reverse) ussion pecify Concrete, Steel Open Hol (Galvaniz Concrete, Steel Concrete, Concr	Diamond Diamond Diamond Digging Driving Digging Antroduction R a OR Material od, Fibreglass, Plastic, Steel) Plastic, Steel) Natical N	ecord - Cas Wall Thickness (cratter) .188 ecord - Scree Slot No.	nestic stock jation strial er, specify From +2 131 en Depti From From	Comm Munici Munici Test H Cooling To To 131 260 De From I31	arcial Not used bal Dewatering ble Monitoring & Air Conditioning Status: of Well Vyater Supply Replacement Well Dewatering Well Dewatering Well Dewatering Well Observation and/or Monitoring Hole Alteration (Construction) Abandoned, Poor Water Quality Abandoned, other, specify Other, specify Hole Diameter To Construction Diameter At (m/fl) Diameter To Construction At (m/fl) Diameter To Construction At (m/fl) Diameter Abandoned, other, Specify Abandoned, other, Abandoned, other, Specify Abandoned, other, Specify Abandoned, other, Specify Abandoned, other, Specify Abandoned, other, Abandoned, other, A	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0 Final water level end of 18.8 If flowing give rate (Ilmin Recommended pumping Ilmin I G20 PA Well production (Ilmin Disinfected? Say I No Please provide a map	nin / GPM) nin / GPM) o depth (nm) o rate o GPUD Map of W/ below following	3 4 5 10 15 20 25 30 40 50 60 60 ell Locc RLA	16.3 16.4 16.4 16.4 16.4 16.4 16.5 16.6 16.6 16.6 16.6 16.6 16.6 16.6	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (I Rotary (I Rotary (I Bosine Cable To Rotary (I Cable To Ro	ool Conventional Reverse) Ussion pedfy Open Hol (Galvaniz, Concrete, Steel , Oper (Plastic, Ga d at Depth @ _ Gas d at Depth @ _ Gas d at Depth fift) _ Gas fid at Depth fift: _ Gas d at Depth fift: _ Gas d at Depth fift: _ Gas	Diamono Diamono Diamono Diating Driving Digging Digging Struction R Arbreglass, Plastic, Steel) Material Materia	ecord - Cas Wall Thickness (ang) . 188 ecord - Scree Slot No. Slot No. Slot No. Fr. Fresh [cofy_ r: Fresh] cofy_ r: Fresh] cofy_ r: Fresh] cofy_ r: Fresh] cofy_ r: Mrand Well	nestic stock jation strial er, specify From +2 131 en Depti From From	Comm Munici Munici Test H Cooling To To 131 260 Deg From I31 U	arcial Not used bal Dewatering ble Monitoring ble Monitoring ble Monitoring ble Replacement Well ble Replacement Well ble Dewatering Well ble Dewatering Well ble Dewatering Well ble Alteration (Construction) blanadoned, nusufficient Supply blandoned, Poor Water Quality blandoned, other, specify ble Diameter th (m/li) blandoned, other, specify blandoned, other, blandoned, blandoned, blandoned, other, blandoned, blandon	Pumping rate (Ilmin 20 Duration of pumping hrs.+ Final water level end of 18.8- If flowing give rate (Ilmin 100' Recommended pump 100' Recommended pump (Ilmin / G20' Recommended pump (Ilmin / G20' Plasse provide a map Please provide a map	nin f pumping (m/li) inin / GPM) o depth (r@) o rate in CEPMD Map: of W/ below following 2 CEDA WAY	3 4 5 10 15 20 25 30 40 50 60 60 60 60 60 15 15 20 25 30 40 50 60 60 15 15 10 15 15 10 15 15 10 15 15 10 15 15 10 15 15 10 15 15 10 15 15 10 15 15 15 10 15 15 15 15 15 15 15 15 15 15	16.3 16.4 16.4 16.4 16.4 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (I Rotary (I Boring Cable To Rotary (I Boring Cable To Buside Diameter (cmtb) Cother, s Cable To Bisside Diameter (cmtb) Cother, s Cable To Bisside Diameter (cmtb) Cother, s Cable To Bisside Diameter (cmtb) Cother, s Cable To Bisside Diameter (cmtb) Cother, s Cable To Diameter (cmtb) Cother, s Cable To Diameter (cmtb) Cother, s Cable To Diameter (cmtb) Cother, s Cable To Diameter (cmtb) Cother, s Cable To Diameter (cmtb) Cother, s Cable To Cother, s Cable To Cother	ool Conventional Reverse) ussion pecify Con Open Hol (Galvanzy Concrete, Steel , Oper (Plastic, Ge (Plastic, Ge dat Depth @ Galvanzy dat Depth @ Galvanzy Gas dat Depth @ Gas dat Depth @ Cock Drill P#PantRto	Diamon Diamon Diating Disting Driving Digging Dig	ecord - Cas Wall Thickness (cmt) .188 ecord - Scree Slot No. Slot No. Slot No. Calls r: Fresh Correct Slot No. Fr. Fresh Correct Corry r: Fresh Correct Slot No. Calls r: Fresh Correct Corry r: Fresh Correct Corry	nestic stock jation strial er, specify From +2 131 en Depti From Popti From	Comm Munici Munici Test H Cooling To To	arcial Not used bal Dewatering ble Monitoring ble Monitoring ble Air Conditioning	Pumping rate (Ilmin 20 Duration of pumping hrs.+ 0 Final water level end of 18.8 If flowing give rate (Ilmin Recommended pumping Ilmin I G20 PA Well production (Ilmin Disinfected? Say I No Please provide a map	nin f pumping (m/li) inin / GPM) o depth (r@) o rate in CEPMD Map: of W/ below following 2 CEDA WAY	3 4 5 10 15 20 25 30 40 50 60 60 60 60 60 15 15 20 25 30 40 50 60 60 15 15 10 15 15 10 15 15 10 15 15 10 15 15 10 15 15 10 15 15 10 15 15 10 15 15 15 10 15 15 15 15 15 15 15 15 15 15	16.3 16.4 16.4 16.4 16.4 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5	3 4 5 10 15 20 25 30 40 50 60	13 13 13 13 13 13 13 13 13 13 13
Cable To Rotary (I Rotary (I Rotary (I Bosine Cable To Rotary (I Cable To Ro	ool Conventional Reverse) ussion pecify Con Open Hol (Galvanzy Concrete, Steel , Oper (Plastic, Ge (Plastic, Ge dat Depth @ Galvanzy dat Depth @ Galvanzy Gas dat Depth @ Gas dat Depth @ Cock Drill P#PantRto	Diamono Diamono Diating Diating Driving Digging Driving Digging driveglass de OR Material de, Fibreglass Plastic, Steel) Hole de Orber, spe Kind of Wate Other, spe Some and Contractor fing Co. Ltc	ecord - Cas Wall Thickness (cmt) .188 ecord - Scree Slot No. Slot No. Slot No. Calls r: Fresh Correct Slot No. Fr. Fresh Correct Corry r: Fresh Correct Slot No. Calls r: Fresh Correct Corry r: Fresh Correct Corry	nestic stock jation strial er, specify From +2 131 en Depti From Popti From	Comm Munici Munici Test H Cooling To To	arcial Not used bal Dewatering ble Monitoring s & Air Conditioning Status of Well Status of Well Available Alteration Construction Abandoned, other, specify Other, specify Cother, specify C	Pumping rate (Ilmin 20 Duration of pumping 1/rs.+0 Final water level and o 18.6 If flowing give rate (Ilmin 100 Recommended pump (Ilmin / GBU 100 Recommended pump (Ilmin / GBU 100 Recommended pump (Ilmin / GBU 20 Please provide a map Please provide a map (180 Please provide a map	nin f pumping (m/li) inin / GPM) o depth (r@) o rate in CEPMD Map: of W/ below following 2 CEDA WAY	3 4 5 10 15 20 25 30 40 50 60 60 60 60 60 60 60 60 60 6	16.3 16.4 16.4 16.4 16.4 16.4 16.5 16.6 16.6 16.6 16.6 16.6 16.6 16.6	3 4 5 10 15 20 25 30 40 50 60 60	13 13 13 13 13 13 13 13 13 13 13 13 13 1
Cable To Rotary (I Rotary (I Boring Cable To Rotary (I Boring Cable To Rotary (I Boring Cable To Busineseter (cmtin) Cotter, s Cable To Bissineseter (cmtin) Cotter four Cable To Dismeter (cmtin) Cotter four Cable To Dismeter (cmtin) Cable To Dismeter (cmtin) Cable To Dismeter (cmtin) Cable To Dismeter (cmtin) Cable To Dismeter (cmtin) Cable To Dismeter (cmtin) Cable To Cable To	ool Conventional Reverse) ussion pecify Con Open Hol (Galvanzy Concrete, Steel , Oper (Plastic, Ge (Plastic, Ge dat Depth @ Galvanzy dat Depth @ Galvanzy Gas dat Depth @ Gas dat Depth @ Cock Drill P#PantRto			nestic stock ation strial er, specify From +2 131 en Depti From Popt From Certain From Certain From Certain From Certain Certai	Comm Munici Munici Test H Cooling To To	arcial Not used bal Dewatering ble Monitoring ble Monitoring ble Monitoring ble Replacement Well ble Recharge Well ble Recharge Well ble Observation and/or Monitoring Hole Alteration (Construction) Abandoned, lnsufficient Supply Abandoned, other, specify ble Diameter th (m/R) blandonet criticion bland blandonet	Pumping rate (Ilmin 20 Duration of pumping 1/rs.+0 Final water level end of 18.6 If flowing give rate (Ilmin 100 Recommended pump 100 Recommended pump (Ilmin / GBU PMA Well production (Ilmin 20 Disinfected? EVes No Please provide a map Please provide a map (180 Please provide a map	nin f pumping (m/li) min / GPM) o depth (r@) o rate n CEPMD Map: of W/ below following CEDA WAY GPM SET ackage Delivere 2014 M [P]	3 4 5 10 15 20 25 30 40 50 60 60 60 60 60 60 60 60 60 6	16.3 16.4 16.4 16.4 16.4 16.4 16.4 16.4 16.4	3 4 5 10 15 20 25 30 40 50 60 60 60 80 80 80 80 80 80 80 80 80 80 80 80 80	13 13 13 13 13 13 13 13 13 13 13 13 73 9 000 9 000 9 00000000
Cable To Rotary (I Rotary (I Boring Cable To Rotary (I Boring Cable To Rotary (I Boring Cable To Busineseter (cmtin) Cotter, s Cable To Bissineseter (cmtin) Cotter four Cable To Dismeter (cmtin) Cotter four Cable To Dismeter (cmtin) Cable To Dismeter (cmtin) Cable To Dismeter (cmtin) Cable To Dismeter (cmtin) Cable To Dismeter (cmtin) Cable To Dismeter (cmtin) Cable To Cable To	ool Conventional Reverse) ussion pecify Concrete, Steel Open Hol (Gatvanizi Concrete, Steel Open Hol (Gatvanizi Concrete, Steel Open Hol (Plastic, Ga Concrete, Gata (Plastic, Ga Concrete, Concrete			nestic stock ation strial er, specify From +2: 131 en Depti From Port From Centested Motested Motested E-mail Aft echnician (n, Dan	Comm Munici Munici Test H Cooling To To	arcial Not used hal Dewatering le Monitoring & Air Conditioning Status of Well Vyater Supply Replacement Well Dewatering Well Construction Abandoned, Poor Water Quality Abandoned, Poor Water Quality Abandoned, Poor Water Quality Abandoned, Poor Water Quality Abandoned, Poor Water Quality Abandoned, Poor Water Quality Abandoned, Other, specify Other, specify 131' 9 ³ /4' 260' 5 ¹⁵ /6' Ition all Contractor's Licence No. 1119 unitRickTornal Abandoned, Status Abandoned, Status Abandone	Pumping rate (Ilmin 20 Duration of pumping 1/13, + 0 Final water level end of 18.6 If flowing give rate (Ilmin 100 Recommended pump (Ilmin / G20 Recommended	nin f pumping (m/li) min / GPM) o depth (r@) o rate n GPM CEPAD C	3 4 5 10 15 20 25 30 40 50 60 60 60 60 60 60 60 60 60 6	16.3 16.4 16.4 16.4 16.4 16.4 16.4 16.4 16.4	3 4 5 10 15 20 25 30 40 50 60 60 60 80 80 80 80 80 80 80 80 80 80 80 80 80	13 13 13 13 13 13 13 13 13 13 13 13 13 1

Ministry's Copy

Instructio	ns for	Compl	eti	na Form	- i -	ADI	44-7	8				ntario Water	age
 For us 	e in the	e Provin	ce	of Ontario	only. This c	document is a pe	rmanen	lega	I document.	I Please retain for	future re	ference	
 All Sec 	ations n	must be	COI	mpleted in	full to avoid	delays in proces	siha Fu	ther i	nstructions a	ement Coordinate	a availah	lo on the he	ick of thi
 All me 	etre me	easurem	ien	ts shall be	reported to	o 1/10th of a met	re		wen manage				
				ue or black		II Information	MUN	16	wa		y Use Or	nly DCR	LOT
Well Owlin	er 5 m	Tormati	рп			in mormation							
		m	1	(0)	wor			$\overline{\mathbf{r}}$	0000		47		<u>ــــــــــــــــــــــــــــــــــــ</u>
RR#/Street	umber/	Name		EIKN		· · · · ·	City/To	wn/Vil	lage	Site/C	ompartme	ent/Block/Tra	act etc.
GPS Readin	\$	NAD	Zor	ie Eastin	a	Northing		ake/Mo	odel Mod	de of Operation:	Undifferen	ntiated	
Log of Ov	erburc	8 3 den and	Be	8 45 # edrock Ma	<u>×82⊦0</u> aterials (se	5008435 e instructions)	m	aç	llar	>	Differentia	ated, specify	
General Color		ost comn				her Materials			Gene	ral Description		Dept	
	C	lay			grau	el						Fror) 9
grey		ne	51	ono	0							9.1	42
<u>v</u> '			Ī										1
			<u> </u>						7.844.844				
	++												
	††												
	Diame		\square			Construction Re	cord				Test of	Well Yield	
Depth From	Metres To	Diamet		Inside diam	Material	Wall thickness	Dep	th	Metres	Pumping test me		raw Down e Water Level	Reco Time Wa
	4.4	15.55		centimetres		centimetres	Fro	m	То	Pump intake set	🔶 min	Metres	min M
	<u> </u>	13.3.	1	· · ·		Casing				(metres)	3 Statio	2.08	
			N		Steel Fibr	reglass		1		Pumping rate - (litres/min) 45	6	3,70	1 8
Water for and	er Recc			15.88	Galvanized	rcrete .48		>	10.7	Duration of pump	ing 2	4.62	2 5.
Water found atMetres	£	d of Water		[Steel		1			Final water level	min end 3	5.60	34
15, D.	Fresh Salty	U Sulphi			Plastic Cor Galvanized	ncrete				of pumping, 3	etres		
Other:	ACC -) / . Sulphi		[Steel Fibr	reglass				Recommended p type.	· – –	6.40	4 3
A Gas	Salty	Minera		[Plastic Cor	ncrete				Recommended pridepth.	imp c	7.09	5 3
	Fresh	Sted.		L	Galvanized	Screen	-			Recommended p	mp 10	8.55	10 2
Gas Other:	Salty	Minera	als	Outside diam	Steel Fibr	reglass Slot No.				Recommended p rate. (litres/min) If flowing give rate	2 15	9.68	15 2
After test of we	all yield,	water was	5		Plastic Con	ncrete	-			(litres/min)	25		20 25
Clear and s	ediment			l	Galvanized	No Cooling on Co	<u></u>			If pumping discont ued, give-reason.	in- 30	10.27	30
					Open hole	No Casing or So		-	<u> </u>	-11	40 50		40 A 50
Chlorinated		No	Ц				10,	0	24.4		60	10.3	60 á
Depth set at - N				aling Recor	r d 🛛 🟹 / urry, neat cemen	t skurnu) oto Volu	Abandonm		In diagram belo	Locat w show distances of v	on of We		nd building
From	™ 1.0		-,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	7			oic metres)	-1	Indicate north b	y arrow.			
7.0 2			10	nt	west	JIJ CH	77C			E1Ku 68 78		,	A.
			Γ			77		-		CIAN	bod	1	- E P
				· ·						68' 12		1	
	\square						·			¥ •	Ikm		
Cable Tool	+	Rota	-		onstruction	ond	Digging	-			1	veer	mea
Rotary (conv		i) 🛃 Air p	percu		🗌 Jettin	ig [Other				1		
Rotary (reve	se)	Borir	g	Water	Drivin	iy —		=					
Domestic Stock		Indu:					Other				I		
	<u> </u>			al		ng & air conditioning			Audit No. 7	11501		Completed	NAL4
Water Suppl		Recharge		Final Statu	us of Well	ished Abon	doned, (Oti			14581 wner's information	Date Deli	204	0 +
Dbservation		Abandon	ed, i	insufficient su	oply 🔲 Dewa	tering			package deliver			<u>```}•00</u>	07
Test Hole	╞╌┶			poor quality ractor/Tech	Repla					Ministry	Use Onl		
Name of Well C	ontractor			0/0	H	Well Contractor's	Licence N	0.	Data Source		Contracto	1 1 1	0
ITN' KI	ss (stree	name, nu	mbe	p LO city etc.)		LUIS			Date Received	YYYY MM DD	Date of In	spection YYY	MM Y
Business Addre		sich	4	uon	d, On	Well Technician's	Licence N	.	JUL 2 Remarks	1 2004	Well Rec	ord Number	
Business Addre	chniciar	n (last nam							. containto		1		
Business Addre	echniciar			Sha	nns	1 Taiz	≯						
Business Addre Name of Well Th Signature of Te	echniciar chnician/	Contractor		Sha	nnæ	1 7ala	> 071					1534	179

Ontario		nistry of the	Environment, and Parks
rements recorded in	n:	🗌 Metric	

E (2018/12)



A295368

Well Record

Regulation 903 Ontario Water Resources Act Page of

Idress of Well Location (Street Number/Name) Township Lot Concession 1738 Cedarlakes Way Osgoode P/L 7 3 ounty/District/Municipality City/Town/Village Province Postal Code Ottawa Carleton Ontario Greelv Northing Municipal F lan and Sublot Number Other NAD | 8 | 3 18 453853 5010034 <u>4M-1555</u> S/L 9-2 verburden and Bedrock Materials/Abandonment : aling Record (see instructions on the back of this form) eneral Colour Most Common Material Other Materials Depth (m General Description From Sand q-Boulders 0 (27 4 Gravel 27 32 1 Grey Limestone 32 112 1 Grey Sandstone ω Limestone Grey 188 / 112'Grey Sandstone N Grey Limestone 188 194 / Annular Space Results of Well Yield Testing 1. 2. 1. 1. Depth Set at (m Type of Sealant Used Volume Placed After test of well yield, water was: Draw Down Recovery (Material and Type) Clear and sand free Time Water Leve Time Water Level 131 / 121 Neat cement Other, specify Not tested (min) 12.4 (m/ft) (m/ft) (min) If pumping discontinued, give reason: Static 121 40:0" 41.24 07 Bentonite slurry 25.2 Level 1 41 1 40.6 Pump intake set at (n) 2 2 41.1 40 180 3 41.2 3 Pumping rate (I/min / CPM) 40 Method of Construction Well Use 20 Cable Tool Diamond Public Commercial Not used 4 41.2 4 40 Duration of pumping Rotary (Conventional) Jetting 🗌 Municipal Dewatering Rotary (Reverse) Driving 5 41.2 1 hrs +__0_min 5 40<u>'</u> ہ' Test Hole Monitoring Boring Digging Irrigation Cooling & Air Conditioning Final water level end of pumping (m/ft) 10 10 Air percussion Industrial 41.2 " Other, specify Other, specify flowing give rate (I/min / GPM) 15 15 Construction Record - Casing Status of Well Recommended pump depth (m®) 20 20 Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel) Inside Vater Supply Wail Depth (mm) Thicknes (cm/a) Replacement Well (cm/c) То 1 25 From 25 Test Hole 100 Recommended pump rate (Vmin / SAM) 20 3/4" Steel :188 Recharge Well +2 / 131 30 30 Dewatering Well <u>6</u>" Open Hole 131 194 40 40 Observation and/or Well production (I/min / GEM) Monitoring Hole 20 Alteration 50 50 (Construction) Disinfected? Abandoned, 60 60 Insufficient Supply **Construction Record - Screen** Mr. San Map of Well Location Abandoned, Poor Jutside iameter Water Quality Depth (m/ft) Please provide a map below following instructions on the Material #1738 CEDARLAKES WAY Slot No AN (Plastic, Galvanized, Steel) Abandoned, other, 'cm/in) TOM То specify Other, specify Water Details a la c Hole Diameter ter found at Depth Kind of Water: 🗌 Fresh 🚺 Intested Hype Chard Depth (m Diameter From (cm/i**b)** 188 (mft) Gas Other, specify 93/4 ter found at Depth Kind of Water: Fresh Untested 0 131 Dolkm (m/ft) Gas Other, specify 131 194 6" ter found at Depth Kind of Water: Fresh Untested (m/ft) Gas Other, specify Fr Well Contractor and Well Technician Information (0) iness Name of Well Contractor Well Contractor's Licence No Air Rock Drilling Co. Ltd. 7681 iness Address (Street Number/Name) Municipality Richmond Comments: 3/4 HP - 15 GPM SET @ 100 FT Postal Code /ince Business E-mail Address air-rock@sympatico.ca ON K0A12701 Well owner's Ministry Use Only Date Package Delivered information package delivered Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name) wdit No. Z337514 Y | Y**2020** | M <u>D(† 0</u> | 28 1138382170 Hanna, Jeremy 1 (Lyes Technicians Licence No. Signature of Technician and/or Contractor Date 34555114667 31 Date Work Completed 2020 20 07 24 Y M M D D SEP 0 8 2020

Ministry's Copy

3

© Queen's Printer for Ontario, 2018

Received

🕅 Ontario	Ministry of Well Well	A 059531	Well Reco	
Instructions for Completi		1159531	Regulation 903 Ontario Water Resources	
For use in the Province	of Ontario only. This docume	ent is a permanent legal doci	ument. Please retain for future reference	
 All Sections must be co Questions regarding col 	mpleted in full to avoid delays mpleting this application can t	in processing. Further instruction of the second to the Water We	ctions and explanations are available on the back of this fo ell Help Desk (Toll Free) at 1-888-396-9355.	rm.
 All metre measuremen Please print clearly in blease 	ts shall be reported to 1/10th	of a metre.	Ministry Use Only	
Well Owner's Information	and Logation of Wall Info	MUN	CON	
()Houre - (arletm	OSan	q q p r q	
RR#/Street Number/Name	ge Coad Re	Cd City/Town/Village	() Site/Compartment/Block/Tract etc.)	T
GPS Reading NAD Zo	Rel Easting Northi 7 4539,38 50		Mode of Operation: Undifferentiated Averaged	7_1
Log of Overburden and B	edrock Materials (see instr	uctions)		
General Colour Most common	Other Material	erials	General Description Depth Metr	es A
Grei	1 himesting	2 really	134 51	31
Grei	Flinestore	+ Sovel Store	Mix 51.81 60	96
	0			
				10.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
Hole Diameter	Constr	ruction Record	Test of Well Yield	
Depth Metres Diameter From To Centimetres	Inside diam Material	Wall Depth M	Aetres Pumping test method Draw Down Recovery	
0 60,96 15.3			To JUBRUM min Metres min Metro	res
	Seel Fibreglass	Casing	(metres) 4 36 Level 6	2
Water Record		480 5	85 (litres/min)	
Water found at Metres Kind of Water	Calvanized			0
Gas Salty Minerals	Plastic Concrete		Final water reveluend 3 6 200 3 6 6	7
Other:	Steel Fibreglass		Recommended pump type. Shallow Deep	<u>s</u>
Gae Salty Minerals	Plastic Concrete		Recommended pump 5 6,85 5 6,6	7
Gas Salty Minerals	Outoido	Screen	Recommended pump 10 6 8 10 6	S
Other:	diam Steel Fibreglass	Slot No.	(litred/min) 15 6 57 15 6 5 If flowing give rate - 20 6 50 20 6 5	27
alegal temper reno 1	Galvanized		(fftres/min) 25 6 1 25 6 4 If pumping discontinued, give reason. 30 6 9 30 6 4	70
Other specific TED	No Ca	sing or Screen	40 6 93 40 6 20 50 6 95 50 6 10 60 6 96 60 6	2
Chlorinated res No.				201
Plugging and Se Depth set at - Metres Material and typ	e (bentonite slurry, neat cement slurry) e	tc. Volume Placed In diag	Location of Well gram below show distances of well from road, lot line, and building	7
From To Neast	Cened Slurr-	1. (cubic metres) 1. A994 Indica	te north by arrow.	2
1219 0 Bendi	meter Slurry	.858	67	
			() 411544	inst salas
Cable Tool	air) Diamond	Digging	110	.01
Rotary (conventional) Rotary (reverse)	ussion Jetting	Other	Stogecon	7
Domestic Industria	Water Use	Other	(De Sair Kood	
Stock Comme	rcial Not used		No O F 4 0 4 Date Well Completed	_
	Final Status of Well		Z 65121 200 7 07/2	<u>8</u>
	insufficient supply	packag	ge delivered?	B
Well Cont	tractor/Technician Information		Ministry Use Only Source Contractor	
Name of Well Contractor, DR	ILIN-COLTO	Contractor's Licence No. Data S	Source Contractor	
	Tories of the			
Business Address (street) ame, numb	MOND UNT T	W Service		DD
Name St Well Technician (last name, fi Descuring the second secon	MOND ONT T irst name) CLS Ken Well	Technician's Licence No. Remai		
Name of Well Technician (last name, fi	MOND ONT T irst name) CLS Ken Well	W Service		DD

Ministry's Copy

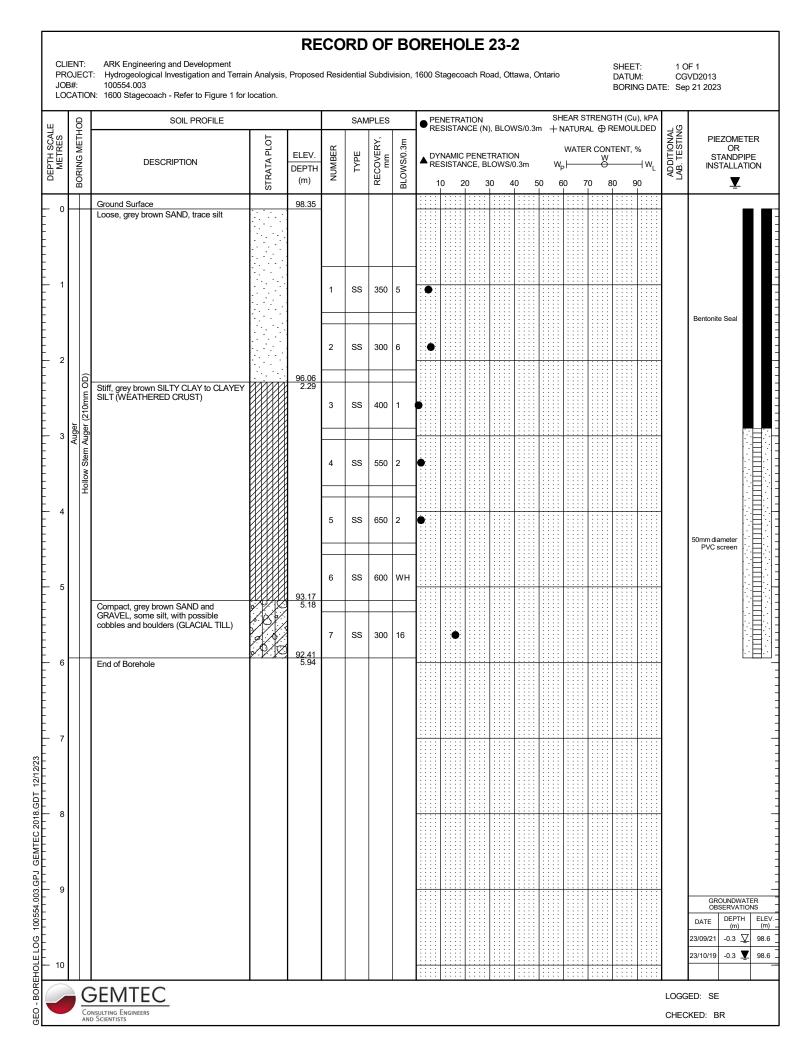
Cette formule est disponible en français

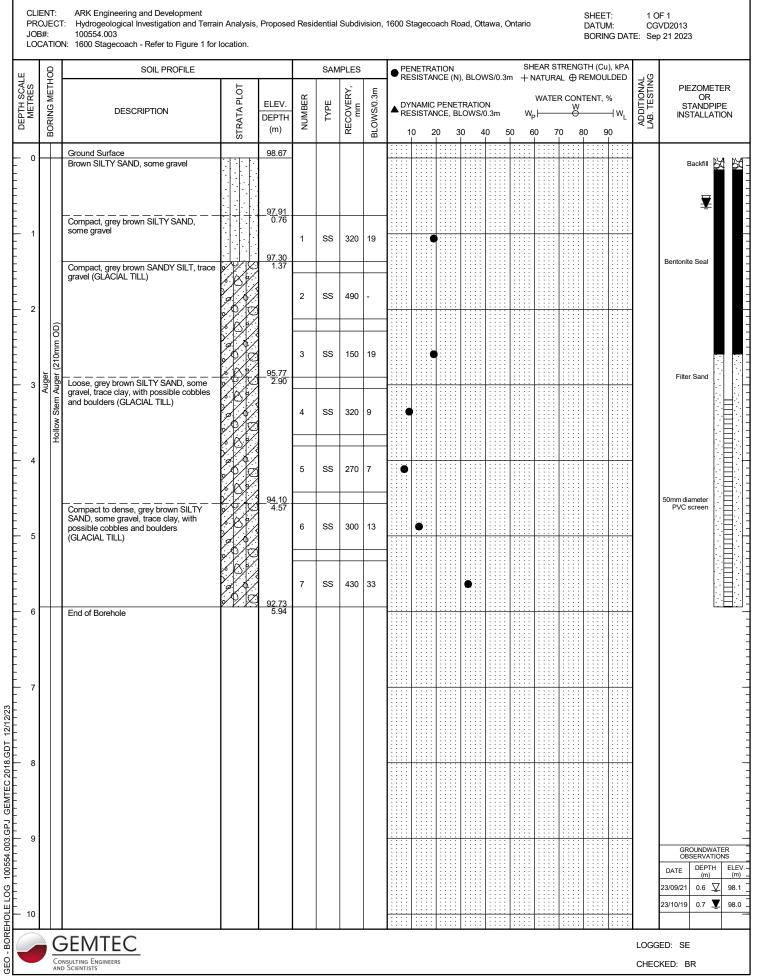
APPENDIX C

Borehole Logs and Soil Characterization GEMTEC (2023) Paterson (2011 and 2023)

	8		SOIL PROFILE				SAM	IPLES		● ^{Pl} R	ENE ESIS		TION	N). B	LOW	/S/0.3	؛ + m	SHEA	R ST	REN AL A	GTH (REMC	Cu), DULE	kPA ED	٥٦		
	BORING METHOD		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	ТҮРЕ	RECOVERY, mm	BLOWS/0.3m	▲ ^D R		MIC STAP	PENE ICE, E			N .3m				R CON W	TEN	Г, %	w	ADDITIONAL LAB. TESTING	PIEZOME OR STANDF INSTALLA	۶IP
-		-	Ground Surface Loose, brown SAND		100.23																	· · ·			Backfill	5
			Compact, grey brown SAND, trace to some gravel, trace slit		<u>98.71</u> 1.52	1	SS	380															• • • • • •		Bentonite Seal	
:	(0001)	(210mm OD)				2	SS	430	18									· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		Filter Sand	
v	Auger	Hollow Stem Auger (210mm				4	SS	380				•						· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·				
		Ĭ																								· · · · · ·
			Stiff, grey brown SILTY CLAY (WEATHERED CRUST)		96.32 3.91 95.81 4.42	5	ss	300	10		•											· · · · · · · · · · · · · · · · · · ·			50mm diameter PVC screen	
;			Compact, grey brown CLAYEY SILT, some gravel, trace sand, with possible cobbles and boulders (GLACIAL TILL)		7.72	6	ss	400	11		•							· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			· ·	· · · · · · · · · · · · · · · · · · ·			
-			5 - (0		94.29 5.94	7	ss	360	21									· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·			Cave	- THE LANG
			End of Borehole Note: auger refusal at 5.5 metres depth		0.04													· · · · · · · · · · · · · · · · · · ·					· · · · · ·			
																		· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·				
																		· · · · · · · · · · · · · · · · · · ·					· · · · · · · · · · · · · · · · · · ·			
																									GROUNDW OBSERVAT DATE DEPTI (m) 23/09/21 1.4 23/10/19 1.4	н Ţ

RECORD OF BOREHOLE 23-1





RECORD OF BOREHOLE 23-3

	PATERS GROUP	01	V				SO		G	EC	DTE	Cŀ	INIC	CAL	IN\	/ES	STI	DA GAT y, On	ION
	DATUM: Geodetic EAST	ING:	37572	29.06		NO	RTHI	NG: 5	0112	07.3	383			ELEV	ΆΤΙΟ	N: 98	3.39		
	PROJECT: Proposed Res	sident	ial De	ev C	edar L	akes	Subd	ivisior	ו			FIL	E NO	P	G68	71			
	BORINGS BY: Excavator REMARKS:				D	ATE:	Octo	ber 4,	2023	3		но	LE NO	р. Т	P 1-	23			
	SAMPLE DESCRIPTION	STRATA PLOT			SAMPLE % RECOVERY	N VALUE or RQD	WATER CONTENT %	DEPTH (m)	Rem Str		ed S h (kl			ak Sh ngth		Blo	ws/0	Resist.).3m (50). Cone)	
		S	NO.	Туре		ź	WAT		0 2	55	07	5100	0 25 I	50 I	75100	0 2	55	0 7510	
	Ground Surface EL 98.39 m	<u> </u>	G1	T#1				0											1
	<u>0.16 m</u> , EL 98.23 m			[#]				-											
	Loose, brown SILTY SAND							- 1 - -											
	Loose, grey SILTY SAND with gravel and seashells		G3	[#]				- - - - - - - - - - - - - - - - - - -											
/ admin / October 06, 2	3.7 m EL 94.69 m GLACIAL TILL: Loose, grey silty sand with gravel, cobbles, occasional boulders, trace clay 4.5 m EL 93.89 m End of Test Pit (Groundwater infiltration at 1.5m depth)		G4	[#]															
RSLog / Geotechnical Borehole - Geodetic / paterson-group	DISCLAIMER: THE DATA PRESE	NTED								2504) IP						TWAS	
RSLog / (PRODUCED. THIS LOG SHOUL	D BE	READ	IN CO		TION	WITH I	TS CO	RRES	PON	DING	REF	PORT.						

	PATERS GROUP	01	V			;	SO	IL P	G	EC	DTE	Cł	E A INIC	CAL	- IN	IVE	STI	GA	TIC	ON
	DATUM: Geodetic EAST	ING:	3758	56.03´		NO	RTHI	\G : 5	0110	975.9	963			ELE	νατι	ON:	97.53	i		
	PROJECT: Proposed Res	siden	tial De	ev C	edar L	akes	Subd	ivisior	1			FIL	E NO	· P	G6	871				
	BORINGS BY: Excavator REMARKS:				D	ATE:	Octo	ber 4,	2023	3		но	LE N	о. Т	P 2	2-23	}			
	SAMPLE DESCRIPTION	STRATA PLOT		/IPLE Type	SAMPLE % RECOVERY	N VALUE or RQD	WATER CONTENT %	DEPTH	Rem Str 0 2	engt	th (kl	Pa)	-	-	(kPa) B m	lows/ nm Dia	Resis 0.3m a. Cor	(50 ne)	Piezometer Construction
	Ground Surface EL 97.53 m		I G1	π#			r	0	· · · ·										<u> т</u>	
	. TOPSOIL 0.16 m / EL 97.37 m /		G1 G2	∎# #				- 0 - - -												
	Loose, brown SILTY SAND		G3	#															1	
	- grey by 0.9m depth							- - - - - -												
)4:17 PM								-2												
, 2023 0	<u>3.9 m</u> EL 93.63 m	: : . ///						-4						-35						
October	Firm, grey SILTY CLAY 44 mEL 93.13 m End of Test Pit	//	G4	[#]				- - - - -												
paterson-group /	(Groundwater infiltration at 1.0m depth)							- 5 - - -										+ ,		
RSLog / Geotechnical Borehole - Geodetic / paterson-group /																				
RSLog / Geote	DISCLAIMER: THE DATA PRESE PRODUCED. THIS LOG SHOU	D BE	READ	IN CO		TION	WITH I	TS CO	RRES	PON	IDING	REF	PORT.							

PATERS GROUP	01	V			;	SO		G	EOTE	ECF	INIC	CAL	. INV	'EST	F DA F IGATI ely, Ont	ON
DATUM: Geodetic EAST	ING:	37582	24.699)	NO	RTHI	NG: 5	0112	74.313			ELE\		N: 98.1	14	
PROJECT: Proposed Rea	sident	ial De	ev C	edar L	akes	Subd	livisior	۱		FIL	E NO.	Ρ	G687	71		
BORINGS BY: Excavator												, т	P 3-2	22		
REMARKS:				D	ATE:	Octo	ber 4,	2023		пО		J.	г J-2	23		
SAMPLE DESCRIPTION	STRATA PLOT		IPLE Type	SAMPLE % RECOVERY	N VALUE or RQD	WATER CONTENT %	DEPTH (m)		oulded S ength (k	Pa)		-	(kPa)	Blows mm [. Resist. s/0.3m (50 Dia. Cone) 50 75100	Piezon Constru
Cround Surface						3										<u> </u>
Ground Surface EL 98.14 m TOPSOIL 0.03 m EL 98.11 m Loose, brown SILTY SAND 0.4 m EL 97.74 m Loose, grey SILTY SAND with gravel 0.6 m EL 97.54 m Stiff, grey SILTY CLAY 1.1 m EL 97.04 m GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and seashells EL 95.84 m End of Test Pit (Groundwater infiltration at 0.7m depth)		G1 G2 G3 G4					- 0 - 1 - 1 - 2 - 3 - 4 - 4 - 5 6						79 82			
DISCLAIMER: THE DATA PRESE PRODUCED. THIS LOG SHOU	D BE	READ	IN CO	NJUNC	TION	WITH I	TS CO	RRESI		G REF	ORT.					<u>I</u>

	PATER GROU	ISOI JP	V			;	SO		GE	ΟΤΕ	ECH	INIC	AL	INV	EST	DA IGAT	ION
		ASTING:	3759	19.947	7	NO	RTHI	\G : 5	011167	.493	1	E	LEVA		1: 103.3	36	
		d Resident	tial De	ev C	edar L	akes	Subd	ivisior	ו		FIL	E NO.	PG	687	71		
	ORINGS BY: Excavato	Dr			D	ATE:	Octo	ber 4,	2023		HO	LE NO	. TP	4-2	23		
	SAMPLE DESCRIPTION	STRATA PLOT	SAN	/IPLE	SAMPLE % RECOVERY	N VALUE or RQD	WATER CONTENT %	DEPTH (m)	Remoul Streng				ık She ıgth (k		Blows	Resist. /0.3m (50 ia. Cone)	
		ST	No.	Туре	S R	N V	WATE		0 25	50 7	'5100	0 25	50	75100	0 25	50 7510	
Grour	nd Surface EL 10	3.36 m															
TOPS		0.3 m	G1	T# 1				- 0									
	e, brown SAND (pit-run) with el, cobbles and boulders		G2	[#]													
eotechnical Borehole - Geodetic / (TP d (TP d	ACIAL TILL: Grey silty clay wi rel and cobbles EL 98. of Test Pit dry upon completion) DISCLAIMER: THE DATA P	i2 <u>m</u> , ¹ i6m RESENTED															-
RSLog ,	PRODUCED. THIS LOG S	HOULD BE	READ	IN CO	NJUNC	TION	WITH I	TS CO		NDING	G REP	ORT. F					

			1		ļ	SO	IL	PR	OF	ILE		ND	TR	ES	ΓD)AT	ΓΑ
PATERS	0	N									INIC						
GROUP								Part o		8, C						Onta	ario
PROJECT: Proposed Res								01097	8.983						72		
BORINGS BY: Excavator	sident	iai De	ev C	edar L	akes	Subd	IVISIOI	ו		FIL	E NO.	PG	i6 87	71			
REMARKS:				D	ATE:	Octo	ber 4,	2023		но	LE NC	. TP	9 5-2	23			
SAMPLE DESCRIPTION	STRATA PLOT	SAN	/IPLE	SAMPLE % RECOVERY	N VALUE or RQD	WATER CONTENT %	DEPTH (m)	Remo Stre	ulded S ngth (k			ak She ngth (k		Blow	n. Res /s/0.3r Dia. C	m (50	Piezometer Construction
	ST	No.	Туре	0.15	N V	WATE		0 25	50	75100	0 25 I	50 I	75100 I	0 25 I	50 I	7 5100	шö
Ground Surface EL 98.72 m	i je ne	G1	T#1				_ 0		:			:		:		<u> </u>	
Loose, brown SILTY SAND		G2	[#]				- - - -										
0.9 m_ EL 97.82 m		G3	[#]				- - 1										
Loose, brown SAND with gravel							-										
2.3 m. EL 96.42 m							-2 - - - -			 - - - - - - - - - - - - - - -	¢2	6					
Firm to stiff, grey SILTY CLAY		G4	[#]				- 					55					
End of Test Pit (Groundwater infiltration at 1.0m depth) DISCLAIMER: THE DATA PRESE PRODUCED. THIS LOG SHOUL							-4 - - - - - - - - - - - - - - - - - -										
(Groundwater infiltration at 1.0m							- - - - - - - - - - - - - - - - - - -										
lechnical Borehole							- - - - - - - - - - - - -										
DISCLAIMER: THE DATA PRESE	LD BE	READ	IN CO	NJUNC	TION	WITH I	Y OF I TS CO		ONDIN	G REF	PORT. F						

	PATERS GROUP	01	V			;	SO		G	EC	DTE	CF	INIC	CAL) T . IN\ on 3	/E\$	STI	GA	TIC	ON
	DATUM: Geodetic EAST	ING:	3762	32.883	3	NO	RTHI	NG: 5	0114	43.5	557			ELE\	/ATIO	N: 9	8.57			
	PROJECT: Proposed Res	sident	tial De	ev C	edar L	akes	Subd	ivisior	ı			FIL	E NO	Ρ	G68	71				
	BORINGS BY: Excavator REMARKS:				П	ΔΤΕ·	Octo	her 4	2023	3		но	LE NO	р. Т	P 6-	23				
							%	,												
	SAMPLE DESCRIPTION	STRATA PLOT	SAN	MPLE	SAMPLE % RECOVERY	N VALUE or RQD	WATER CONTENT %	DEPTH (m)	Rem Str		ed S th (kl			ak Sh ngth	iear (kPa)	Blo	ws/0	Resist).3m (a. Cor	(50	Piezometer Construction
		ST	No.	Туре	ол Ш	> N	WATE		02	55	07	5100	0 25	50	7510	0 0 2	25 5	6075	300 E	-0
	Ground Surface EL 98.57 m						1	LO									1			
	PEAT 0.3 m EL 98.27 m 0.6 m 		G1 G2 G3	[#] [#]				- 0 - - - - - - - - - - - - - - - -												
	GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders																			
RSLog / Geotechnical Borehole - Geodetic / paterson-group / admin / October 06, 2023 04:17 PM	<u>3.8 m</u> EL 94.77 m End of Test Pit (Groundwater infiltration at 1.0m depth)		G4	[#]																
RSLog / Geotechi	DISCLAIMER: THE DATA PRESE PRODUCED. THIS LOG SHOUI	D BE	READ	IN CO		TION	WITH I	TS CO	RRES	PON	IDING	REF	ORT.							

Image: Second Surface EL 9666 m Compact, brown SULTY SAND Compact, brown SULTY SAND (Compact, grey SILTY SAND with graved, some day, occasional toobles, trace seashelds G1 [# 1] 0 G3 [# 1] G3 [# 1] 1 0 G4 [# 1]		PATERS GROUP	01	V			;	SO		G	EO	TE	Cŀ	INI	CAL	. IN\	/ES	STI	DA GAT /, On [*]	ON
BORINGS BY: Excavator REMARKS: DATE: October 4, 2023 HOLE NO. TP 6A-23 HOLE NO. TP 6A-23 HOLE NO. TP 6A-23 HOLE NO. TP 6A-23 HOLE NO. TP 6A-23 Frequencies of the series of the		DATUM: Geodetic EAST	ING:	37627	76.215	;	NO	RTHI	NG: 5	0114	67.1 [,]	43			ELE	VATIO	N: 98	3.66		
REMARKS: DATE: October 4, 2023 HOLE NO. TP 6A-23 SAMPLE DESCRIPTION Image: Construction of the strength (kPa) of t			sident	ial De	ev C	edar L	akes	Subd	ivisior	۱			FIL	E NO	• P	G68	71			
CLINKIG. DITL: Output SAMPLE DESCRIPTION Image: Comparison of the second													но		о Т	P 6/	1_22	2		
SAMPLE DESCRIPTION SAMPLE Starting of the second start of the s		REMARKS:				D	ATE:	Octo	ber 4,	2023			110		0. 1	1 07	1-20	,		
Ground Surface EL 68.66 m TOPSOLL Compact, Jong SULTY SAND 0.16, 17, 17, 18, 100 m Compact, grey SILTY SAND with gravel, some day, occasional could be trace seasibles 0.2 [# J] G3 [# J] GLACIAL TILL: Dense, grey silly sand with gravel, cobbles and boulders 0.4 [# J] GLACIAL TILL: Dense, grey silly sand with gravel, cobbles and boulders 0.4 [# J] GLACIAL TILL: Dense, grey silly sand with gravel, cobbles and boulders 0.4 [# J] Glace for the st Pit (Groundwater infiltration at 1.0 m 0.4 [# J] End of Test Pit (Groundwater infiltration at 1.0 m 0.5 [-5 [-5 [-5 [-5 [-5 [-5 [-5 [SAMPLE DESCRIPTION				SAMPLE % RECOVERY	N VALUE or RQD	VATER CONTENT %	DEPTH (m)	Stre	engtl	n (kF	Pa)	Stre	ength	(kPa)	Blo mm	ws/0 n Dia	.3m (50 . Cone)	Piezon Constru
TOPSOL Dog n / fill Image: fill (fill fill fill fill fill fill fil		Ground Surface EL 98.66 m	<u>ו</u>					>							I	<u> </u>			I	1
Compact. prove SILTY GAND ULL		TOPSOIL		G1	[#]				- 0		1									
Compact, grey SILTY SAND with gravel, some day, occasional cobbles, trace seashells CBLACIAL TILL: Dense, grey silty sand with gravel, cobbles and boulders ELGABER CA [#] CA [k			G2	[#]															
i cobbles, trace seashells 0.5 m² EL de tion EL de tion GLACIAL TILL: Dense, grey silty sand with gravel, cobbles and boulders G4 End of Test Pit G4 (Groundwater infiltration at 1.0m G4 bepti) G64 DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS		Compact, grey SILTY SAND with		G3	[#]				-			1								
GLACIAL TILL: Danse, grey silty sand with gravel, cobbles and boulders		achhlan traca acachalla I							-1											-
End of Test Pit (Groundwater infiltration at 1.0m depth) DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS	(GLACIAL TILL: Dense, grey silty sand																		-
End of Test Pit (Groundwater infiltration at 1.0m depth) DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS				G4	[#]				- - - -											
(Groundwater infiltration at 1.0m depth) Groundwater infiltration at 1.0m DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS	- - -		[<i>[.</i>].								1	1							 	
DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS		(Groundwater infiltration at 1.0m							- 4 - - - - - -											
DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS									5	; ;		;						T		-
DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS	16-100								-											
DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS	/ parci								F			-								
									- - 6											-
PRODUCED. THIS LOG SHOULD BE READ IN CONJUNCTION WITH ITS CORRESPONDING REPORT. PATERSON GROUP IS NOT RESPONSIBLE FOR THE UNAUTHORIZED USE OF THIS DATA.			LD BE	READ	IN CO	NJUNC	TION	WITH I	TS CO	RRES	PON	DING	REF	PORT.						

	PATERS GROUP	01	V				SO		G	EC	DTE	CF	E A INI Conc	CA		NV	'ES	STI	GA	TI	ON
	DATUM: Geodetic EAST	ING: 3	37635	51.584	1	NO	RTHI	NG: 5	0114	67.6	606			ELI	EVA	TIO	1: 98	3.9			
	PROJECT: Proposed Res	sident	tial De	ev C	edar L	akes	Subd	ivisio	٦			FIL	E NC).	PG	68	71				
	BORINGS BY: Excavator														T D	7 0					
	REMARKS:				D	ATE:	Octo	ber 4,	2023	3		но	LE N	0.	IP	1-2	23				
	SAMPLE DESCRIPTION	STRATA PLOT		/IPLE	SAMPLE % RECOVERY	N VALUE or RQD	WATER CONTENT %	DEPTH (m)	Rem Str 0 2	engt	th (ki	Pa)		engt	Shea h (k		Blo mr	ws/0 n Dia	Resis).3m 1. Co 1. 7	(50 one)	Piezometer Construction
	Ground Surface EL 98.9 m						5									I					
	TORSOIL	\\//`.	G1	ד#ז				- 0													
	Loose, brown SILTY SAND		G2	[#]				-													
	- grey by 0.8m depth		G3	[#]												<u>.</u>					
	- grey by 0.011 depth			"				-				1 1 1		1		 			 		
	1.6 m EL 97.3 m											 				- - - - - -			 	- - - - - - - -	
	GLACIAL TILL: Dense, grey silty sand with gravel, cobbles and boulders							- - - - -													
_			G4	[#]								- 			 	 			 	- 	
3 04:17 PM	3.5 m EL 95.4 m End of Test Pit	Y /_						-								 					
6, 202;	(Groundwater infiltration at 1.0m							-4											, 		
RSLog / Geotechnical Borehole - Geodetic / paterson-group / admin / October 06, 2023 04:17 PM	depth)							- - - -											 		
lpe / dr								- - -5													
on-grou								Ē											1 1		
paters								F											1		
detic /								F											 		
e - Geo								-6							, , ,				¦'		
orehole												1 1 1 1		1					 		
nical Bo								Ē				 				 			 		
otechn								- 7								 			. 	1 1 1	
RSLog / Ge	DISCLAIMER: THE DATA PRESE PRODUCED. THIS LOG SHOU	D BE	READ	IN CO		TION	WITH I	TS CO	RRES	PON	IDING	REF	PORT.								

patersong	ro	ur		nsultir gineer	ng s т				ND TEST DAT	Α
28 Concourse Gate, Unit 1, Ottawa,		_		,	R	ipley Sul ttawa (G	odivisio	n - Stagecoa	ach Road	
DATUM Grades interpolated bas	sed on to	opogra	aphic	inform	ation	by others			FILE NO. PH1276	;
REMARKS BORINGS BY Backhoe				-		O.4 Maxim			HOLE NO. TP 7	
BORINGS BY DACKING			<u>م</u> م			24 Nover			sist. Blows/0.3m	1
SOIL DESCRIPTION	A PLOT			1	Шо	DEPTH (m)	ELEV. (m)) mm Dia. Cone	Piezometer Construction
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or ROD			• Wa	ater Content %	Piezo
GROUND SURFACE	0		4	R	z °	0-	101.40	20	40 60 80	
TOPSOIL										
Red-brown to grey medium SAND	40	G	12			2-	- 100.40 - 99.40 - 98.40			¥
End of Test Pit										
(Water infiltration @ 1.1m depth)									40 60 80 100 Strength (kPa)	0

paterson	aroi	ır	Co	nsultir	ng	SOI		OFILE A	ND TEST DAT	A
28 Concourse Gate, Unit 1, Otta	-	-	Eng	gineer	R		odivisio	n - Stageco	ological Study bach Road	-
DATUM Grades interpolated	l based on to	pogra	aphic	inform					FILE NO. PH1276	<u> </u>
REMARKS										
BORINGS BY Backhoe				D	ATE	24 Nover	nber 200)9	TP 9	
SOIL DESCRIPTION	TOIT	SAMPLE			D				esist. Blows/0.3m 0 mm Dia. Cone	eter Stion
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or ROD	(m)	(m)	0 W	Vater Content %	Piezometer Construction
GROUND SURFACE	LS	H	- DN	REC	N OF			20	40 60 80	٥٦
TOPSOIL	0.25					- 0-	100.20			
		G	16			1-	-99.20			9
Red-brown to grey-brown medium SAND with gravel		G	17			2-	-98.20			Ţ
Firm, grey-brown SILTY CLAY	_ <u>2.75</u>	G	19			3-	97.20			
End of Test Pit		-								
(Water infiltration @ 2.2m depth)								20 Shear ▲ Undistur	40 60 80 100 Strength (kPa) 'bed △ Remoulded	0

patersongroup	SO
Patersong oup Engineers	Terrain A

SOIL PROFILE AND TEST DATA

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

Terrain Analysis & Hydrogeological Study Ripley Subdivision - Stagecoach Road Ottawa (Greely), Ontario

DATUM Grades interpolated bas	ed on to	opogra	aphic	inform	ation	by others	-		FILE NO. PH1	1276
REMARKS						04.04	h	•	HOLE NO. TP	
BORINGS BY Backhoe		1		C	DATE	24 Nover	nber 200		L	
SOIL DESCRIPTION	TOIT A			VIPLE 문	Що	DEPTH (m)	ELEV. (m)		esist. Blows/0.: 0 mm Dia. Cone	55
	STRATA	TYPE	NUMBER	° SECOVERY	N VALUE or RQD				/ater Content %	Constr
GROUND SURFACE			ļ	Ř	×	0-	103.60	20	40 60 80	·
· · · · · · · · · · · · · · · · · · ·	1 <u>0</u> 									
Dark brown SILTY SAND	50 · . · · · · · · · · · · · · · · · · ·	G	20							
Dense, light brown SILTY SAND/SANDY SILT with gravel		G	21			1-	- 102.60			
						2-	-101.60			
2.8 End of Test Pit	0	_								
(TP dry upon completion)								20	40 60 80	100
									Strength (kPa)	

DATUM Grades interpolated based on topographic information by others. FILE NO PH1276 REMARKS BORINGS BY Backhoe DATE 24 November 2009 PILE NO. TP11 SOIL DESCRIPTION OF SAMPLE DEPTH ELEV. (m) PLE NO. TP11 GROUND SURFACE DEPTH ELEV. PILE NO. TP11 GROUND SURFACE DEPTH ELEV. PILE NO. TP11 GROUND SURFACE DEPTH ELE NO. PLE NO. TP10 GROUND SURFACE DEPTH ELE NO. PLE NO. </th <th>patersong 28 Concourse Gate, Unit 1, Ottawa, G</th> <th></th> <th>_</th> <th>Col</th> <th>nsultii gineer</th> <th>Ri</th> <th>errain An</th> <th>alysis 8 divisio</th> <th>DFILE AND TEST DATA A Hydrogeological Study n - Stagecoach Road Ontario</th>	patersong 28 Concourse Gate, Unit 1, Ottawa, G		_	Col	nsultii gineer	Ri	errain An	alysis 8 divisio	DFILE AND TEST DATA A Hydrogeological Study n - Stagecoach Road Ontario
BORINGS BY Backhoe HOLE NO. TP11 DATE 24 November 2009 OTOPSOIL O.30 GROUND SURFACE TOPSOIL O.30 G GLACIAL TILL: Light brown silty sand with gravel, cobbles and boulders G 22 End of Test Pit 2.70		ed on to	pogr	aphic	inform				FILE NO.
DATE 24 NOVEMBER 2009 SOIL DESCRIPTION Sample Depth for the second					_		0 / N		TD44
SOIL DESCRIPTION O DEPTH M ELEV. (m) • 50 mm Dia. Cone Diggetter (m) GROUND SURFACE 0 00 101.80 0 40 60 80 TOPSOIL 0.30 0 0 101.80 0 101.80 0 101.80 0 0 101.80 0 101.80 0 101.80 0 0 101.80 0 0 101.80 0 0 101.80 0 101.80 0 101.80 0 0 101.80 0 0 101.80 0 0 101.80 0 0 101.80 0	BORINGS BY BACKHOE			0 4 4		DATE	24 Nover	nber 200	
GROUND SURFACE 0 1 1 101.80 20 40 60 80 TOPSOIL 0.30 0 101.80 0 101.80 0 101.80 0	SOIL DESCRIPTION				1	61 0	-	1	● 50 mm Dia. Cone
GROUND SURFACE 0 0 0 101.80 20 40 60 80 TOPSOIL 0.30 0 1 101.80 0 101.80 0		TRAT?	ТҮРЕ	TUMBEL	COVEI				○ Water Content %
GLACIAL TILL: Light brown silty sand with gravel, cobbles and boulders End of Test Pit (Water infiltration @ 0.35m	GROUND SURFACE			4	RE	z °	0-	101.80	20 40 60 80
	GLACIAL TILL: Light brown silty sand with gravel, cobbles and boulders 2.7 End of Test Pit (Water infiltration @ 0.35m		G	22					

paterson	aroi	ır	Cor	nsultir	ng	SOI	L PRO	OFILE A	ND TEST DAT	Ά
28 Concourse Gate, Unit 1, Otta		-	J Eng	gineer	R	errain Ar ipley Sul ttawa (G	odivisio	n - Stageco	ological Study bach Road	
DATUM Grades interpolated	based on to	pogr	aphic i	informa					FILE NO. PH1276	;
REMARKS										
BORINGS BY Backhoe				D	ATE	24 Nover	nber 200)9	TP12	
SOIL DESCRIPTION	PLOT		SAN	/IPLE		DEPTH (m)	ELEV. (m)		esist. Blows/0.3m 0 mm Dia. Cone	neter Iction
	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or RQD			• v	Vater Content %	Piezometer Construction
GROUND SURFACE			4	RE	z ^o	0.	100.50	20	40 60 80	
TOPSOIL	0.30									
Brown to grey-brown medium SAND	3.80	G	23			2-	- 99.50 - 98.50			¥
End of Test Pit										
(Water infiltration @ 1.0m depth)								20 Shear ▲ Undistur	40 60 80 100 Strength (kPa) bed △ Remoulded	0

patersong 28 Concourse Gate, Unit 1, Ottawa		-		nsultir Jineer	R	errain Ar ipley Sul	alysis &	Hydroge - Stagec	ological	EST DAT	<u>~</u>
DATUM Grades interpolated ba	ased on to	pogra	aphic i	nform	ation	by others			FILE NO	^{o.} PH1276	;
REMARKS BORINGS BY Backhoe				-		7 Decem	h a z 2010		HOLEN	^{10.} TP18	
BORINGS BY DACKING			241	IPLE			ber 2010				
SOIL DESCRIPTION	A PLOT				Шо	DEPTH (m)	ELEV. (m)		n. Resist. Blows/0.3m ● 50 mm Dia. Cone		Piezometer
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or ROD			• V	Vater Co	ontent %	Piezol
GROUND SURFACE	oj.		24	RE	z °	0-	102.00	20	40	60 80	Ļ
TOPSOIL	0.60										
SAND with cobbles and poulders	L. <u>60</u>					1-	-101.00				****
GLACIAL TILL: Silty clay with and, gravel, cobbles and boulders						2-	-100.00				
End of Test Pit	6. 10					3-	99.00				
TP dry upon completion)								20	40 6	0 80 10	

patersong	iroi		Co	nsultin	g	SO		OFILE A		ΟΑΤΑ	
28 Concourse Gate, Unit 1, Ottaw		_	- En	gineers	Ri	Terrain Analysis & Hydrogeological Study Ripley Subdivision - Stagecoach Road Ottawa (Greely), Ontario					
DATUM Grades interpolated b	· · ·		aphic	informa				Ontario	FILE NO.		
REMARKS		-	-			-			PH	1276	
BORINGS BY Backhoe DA						ATE 7 December 2010			HOLE NO. TP	19	
SOIL DESCRIPTION	PLOT		SA	MPLE		DEPTH	ELEV.	1	esist. Blows/0.	3m	
SOIL DESCRIPTION	STRATA P.	E	BER	VERY	E C C	(m) KOD	(m)		0 mm Dia. Cone	zome struc	
GROUND SURFACE	STR	ТУРЕ	NUMBER	RECOVERY	N VA of I			0 M 20	<pre>/ater Content % 40 60 80</pre>	C D S	
TOPSOIL						0	100.00			,	
	<u>0.30</u>										
SAND	0.70										
	0.70 										
						1-	-99.00				
GLACIAL TILL: Silty clay with sand, gravel, cobbles and											
boulders		i									
						2-	-98.00				
	2.60										
End of Test Pit											
Practical refusal on boulders @ 2.60m depth											
(TP dry upon completion)											
							i				
								20 Shear	40 60 80 Strength (kPa)	100	

 \blacktriangle Undisturbed \triangle Remoulded

patersongr		Ir	Col	nsultir	ng	SOI	L PRO	OFILE A	ND TEST DAT	Ą
_		_	Eng	gineer				Hydrogeo n - Stageco	ological Study bach Road	
28 Concourse Gate, Unit 1, Ottawa, ON DATUM Grades interpolated based			aphic	inform	0	ttawa (G	reely), (FILE NO	
REMARKS		F-9-	1						HOLE NO	
BORINGS BY Backhoe	BORINGS BY Backhoe DATE 7 December 2010									
	PLOT		SAN	MPLE		DEPTH	ELEV.	Pen. Re	esist. Blows/0.3m	55
SOIL DESCRIPTION			м	RY	Ľ۵	(m)	(m)	• 5	0 mm Dia. Cone	Piezometer Construction
	STRATA	TYPE NUMBER NUMBER N VALUE or RQD				• N	ater Content %	Piezo		
GROUND SURFACE	ŝ	_	E	RE	N N N	- 0	98.50	20	40 60 80	-0
TOPSOIL							00.00			
0.40									• • • • • • • • • • • • • • • • • • • •	
									•	Ţ
						 1-	97.50			
SAND										
						2-	96.50			
2.70 End of Test Pit										
(GWL @ 0.7m depth)										
							:			
									40 60 80 100 Strength (kPa))
								▲ Undistur		

DATUM Grades interpolated bas REMARKS BORINGS BY Backhoe SOIL DESCRIPTION GROUND SURFACE TOPSOIL 0.3 SAND 1.6 MARL 2.0 SAND with boulders 2.7 End of Test Pit GWL @ 1.6m depth)					R	errain Ar ipley Sul ttawa (G	bdivisio	n - Stageco	ological Study bach Road	Ά
BORINGS BY Backhoe SOIL DESCRIPTION GROUND SURFACE TOPSOIL 0.3 SAND 1.6 MARL 2.0 SAND with boulders End of Test Pit	ed on to	pogra	aphic	inform					FILE NO. PH1276	 ;
SOIL DESCRIPTION GROUND SURFACE TOPSOIL 0.3 SAND 1.6 MARL 2.0 SAND with boulders 2.7 End of Test Pit									HOLE NO. TP21	
GROUND SURFACE TOPSOIL 0.3 SAND 1.6 MARL 2.0 SAND with boulders 2.7 End of Test Pit 2.7					DATE	7 Decem	ber 2010			
TOPSOIL 0.3 SAND 1.6 MARL 2.0 SAND with boulders 2.7 End of Test Pit 2.7	PLOT		SAN	APLE		DEPTH (m)	ELEV. (m)		esist. Blows/0.3m 0 mm Dia. Cone	Piezometer
TOPSOIL 0.3 SAND 1.6 MARL 2.0 AND with boulders 2.7 Ind of Test Pit 2.7	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or RQD			• N	ater Content %	Piezon
0.3 SAND1.6 MARL2.0 SAND with boulders2.7 ind of Test Pit	S		z	Ë	¤ ⁰	0.	99.20	20	40 60 80	
SAND 1.6 MARL 2.0 SAND with boulders	20						99.20			
/IARL 2.0 SAND with boulders 2.7 End of Test Pit 2.7						1-	-98.20			
nd of Test Pit						2-	97.20			Ţ
	0									
								20	40 60 80 100	

patersongr	0	Jr	Cor	nsultir	ng				ND TEST DAT	Α
28 Concourse Gate, Unit 1, Ottawa, C			e Eng	jineer	R	errain Ar ipley Sul ttawa (G	bdivisio	n - Stageco	ological Study bach Road	
DATUM Grades interpolated base	d on to	pogra	aphic	inform				Silano	FILE NO. PH1276	;
REMARKS									HOLE NO. TP22	
BORINGS BY Backhoe		<u> </u>			ATE	7 Decem	ber 201(
SOIL DESCRIPTION	PLOT			/IPLE		DEPTH (m)	ELEV. (m)		esist. Blows/0.3m 0 mm Dia. Cone	neter uction
	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or ROD			• v	Vater Content %	Piezometer Construction
GROUND SURFACE	s.		Z	RE	z °	- - 0-	99.40	20	40 60 80	
TOPSOIL	0_							·····		
SILTY CLAY with sand	0					1-	-98.40			¥
SILT with boulders						2-	-97.40			
3.50						3-	-96.40			
End of Test Pit	4.1.1.1									
(GWL @ 1.0m depth)								20	40 60 80 100	0
								Shear ▲ Undistu	Strength (kPa)	

	ig ^s Te
--	-----------------------

SOIL PROFILE AND TEST DATA

Terrain Analysis & Hydrogeological Study Ripley Subdivision - Stagecoach Road Ottawa (Greely) Optario 28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

DATUM Grades interpolated ba	ased on to	pogra	aphic	inform		by others		mario	FILE NO. PH1276
REMARKS									
BORINGS BY Backhoe				D	ATE	7 Deceml	ber 2010		TP23
SOIL DESCRIPTION	TOIG		SAN	MPLE	1	DEPTH	ELEV. (m)		esist. Blows/0.3m 0 mm Dia. Cone
	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or RQD	Provide the second seco		• V	esist. Blows/0.3m 0 mm Dia. Cone Vater Content %
GROUND SURFACE	02		24	RE	щ°	0-	-99.00	20	40 60 80
TOPSOIL	0.30								Σ
	0.50								
GLACIAL TILL: Silty sand with cobbles and boulders						2-	- 98.00 - 97.00		
End of Test Pit (GWL @ 0.2m depth)	3.50 <u>(^^^^</u>							20	
								20 Shea ▲ Undisti	r Strength (kPa)

natersonar		In	Cor	sultin	g	SOI		FILE A	ND TEST DAT	Ά
patersongr 28 Concourse Gate, Unit 1, Ottawa, ON			Eng	ineers	R	errain An ipley Suł ttawa (G	odivisio	n - Stageco	ological Study bach Road	
DATUM Grades interpolated based			phic i	nforma				Jilanu	FILE NO. PH1276	
REMARKS										
BORINGS BY Backhoe				D	ATE	7 Decem	ber 2010)	TP24	
SOIL DESCRIPTION	TOII		SAN	IPLE		DEPTH (m)	ELEV. (m)		esist. Blows/0.3m 0 mm Dia. Cone	leter ction
	STRATA	ТҮРЕ	NUMBER	% RECOVERY	N VALUE or ROD		(,	• v	Vater Content %	Piezometer Construction
GROUND SURFACE	ŝ		E.	RE	z ö		99.70	20	40 60 80	
TOPSOIL 0.40 SILTY SAND 0.80						0	99.70	• • • • • • • • • • • • •		 ⊻
GLACIAL TILL: Slty sand with cobbles and boulders						1-	-98.70			· · · · · · · · · · · · · · · · · · ·
with cobbles and boulders							-97.70			•
<u>3.20</u> End of Test Pit										-
(GWL @ 0.7m depth)										
								20 Shea ▲ Undistu	r Strength (kPa)	00

patersongr		ir	Cor	nsultir	ng	SOI			ND TEST DAT	Α
28 Concourse Gate, Unit 1, Ottawa, ON			eng Eng	gineer	R	errain An ipley Sul ttawa (G	odivisio	n - Stagecoa	logical Study ach Road	
DATUM Grades interpolated based	l on to	pogra	aphic	inform					FILE NO. PH1276	 i
REMARKS										
BORINGS BY Backhoe				D	ATE	7 Decem	ber 2010	ן כ	TP25	
SOIL DESCRIPTION	PLOT		SAN	NPLE		DEPTH (m)	ELEV. (m)		sist. Blows/0.3m mm Dia. Cone	eter ction
	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or ROD	(,	(,	• Wa	ater Content %	Piezometer Construction
GROUND SURFACE	S		L F	REC	N O	0	101 00	20	40 60 80	щO
TOPSOIL 0.30						0-	101.20			
SAND 3.00 End of Test Pit (GWL @ 0.5m depth)						2-	- 100.20 - 99.20 - 98.20			¥
									40 60 80 100 Strength (kPa) red △ Remoulded	D

natoreona	ro		Cor	nsultir	ng	SOI	L PRC	FILE A	ND TEST DAT	Α
patersong 28 Concourse Gate, Unit 1, Ottawa,		_	Eng	jineer	R	ipley Sub	odivisior	1 - Stageco	ological Study oach Road	
DATUM Grades interpolated bas			aphic i	inform		ttawa (Gi bv others		Ontario	FILE NO.	
REMARKS		-13-				,			PH1276	j
BORINGS BY Backhoe				D	ATE	17 Decen	nber 201	0	HOLE NO. TP26	
	Ę		SAN	/IPLE				Pen. R	esist. Blows/0.3m	
SOIL DESCRIPTION	PLOT			к	M	DEPTH (m)	ELEV. (m)	• 5	0 mm Dia. Cone	mete
	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or RQD			• V	Vater Content %	Piezometer Construction
GROUND SURFACE	L S	-	I NI	REC	N OL			20	40 60 80	٥Ū
TOPSOIL						- 0-	-98.90			
0	.35	_								
Brown SAND		G	1							
<u>0</u>	.80	-								
						1-	-97.90			
										Ţ
						2-	-96.90			
Light brown SAND		G	2							
		G	2							
						3	-95.90			
					, ,		33.30			
						:				
	.80 .00	-								
End of Test Pit	.00 ////	4				4-	94.90			
(GWL @ 1.8m depth)										
								²⁰ Shea	40 60 80 10 r Strength (kPa))0
								🔺 Undisti		

SOIL PROFILE AND TEST DATA

ngineers Terrain Analysis & Hydrogeological Study Ripley Subdivision - Stagecoach Road

28 Concourse Gate, Unit 1, Ottawa, 0	ON K2E	7T7				ttawa (Gi	reely), C	ntario		
DATUM Grades interpolated base		FILE NO. PH1276	5							
REMARKS								-	HOLE NO. TP27	
BORINGS BY Backhoe	<u> </u>	1		D	ATE	17 Decer	nber 201	0		
SOIL DESCRIPTION	PLOT		SAN	NPLE		DEPTH			sist. Blows/0.3m) mm Dia. Cone	eter ction
	STRATA	TYPE	NUMBER	* RECOVERY	N VALUE or ROD	(m)	(m)		ater Content %	Piezometer Construction
GROUND SURFACE	STE	F	NUN	RECO	N OF O			20	40 60 80	۵Ğ
						- 0-	102.80			, *
	10									
Brown SAND		G	3							
						1-	-101.80			-
Light brown SAND						2-	-100.80			⊻
						3-	-99.80			• • • • • • • • • • • • • • • • • • • •
4.(00									
CLACIAL TILL Brown silty	20 <u>· · · · ·</u> 20 <u>· · · · ·</u> 20 <u>· · · · ·</u>					4-	-98.80	20	40 60 80 10	00
									Strength (kPa)	

SOIL PROFILE AND TEST DATA

Terrain Analysis & Hydrogeological Study Ripley Subdivision - Stagecoach Road

28 Concourse Gate, Unit 1, Ottawa, C	N K2E	7T7				itawa (Gi		ntario		ч	
DATUM Grades interpolated based on topographic information by others.										PH1276	
REMARKS									HOLE NO		
BORINGS BY Hand Auger				D	ATE	4 Octobe	r 2010	. <u>.</u>		[″] AH 1	1
SOIL DESCRIPTION	гол		SA	MPLE		DEPTH			esist. Blo 0 mm Dia	ows/0.3m a. Cone	eter ction
	STRATA	TYPE	NUMBER	% RECOVERY	VALUE r ROD	(m)	(m)	0 N	Vater Con	itent %	Piezometer Construction
GROUND SURFACE	LS	F	DN	REC	N OL		00.15	20	40 60	0 80	щО
TOPSOIL (high humic content)	5					0-	-99.15				
						1-	-98.15				
Brown medium SAND											
						2-	-97.15				¥
2.30											
End of Auger Hole											
(GWL @ 2.12m depth)								20 Shea ▲ Undistu	40 60 r Strength írbed △ F		0

Terrain Analysis & Hydrogeological Study Ripley Subdivision - Stagecoach Road

SOIL PROFILE AND TEST DATA

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

Ottawa (Greely), Ontario

DATUM Grades interpolated base	ed on to	opogra	aphic	inform	ation	by others	i.				FI	LE N	0.	P	H12	276	
REMARKS											н	DLE	NO.		H		
BORINGS BY Hand Auger		1.		E	DATE	7 Decem	ber 2010)						A	. П 4	4	
SOIL DESCRIPTION	PLOT		SAI	MPLE	1	DEPTH (m)	ELEV. (m)		Pen •			st. I ım D				n	eter ction
	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or RQD		(11)		0	w	ate	er C	ont	ent	%		Piezometer Construction
GROUND SURFACE	LS		NU	REC	N	0	98.50		2	0	40)	60		80		ш0
TOPSOIL						0	90.00										
0.2	25							-	 								
										•							
																	¥
SAND					:												_
						1-	97.50	-		++					++		
														• • •			
1.6																	
End of Auger Hole	<u>io</u>																
(GWL @ 0.8m depth)																	
								· · ·	20		40		60 61		: : 80 22)	 10	0
									Sr Une			ren d 4			'a) uldeo	ł	

patersongr	01	ur		nsultiı gineer		errain Ar	nalysis &	Hydroged	ological S		Α		
28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7 Ripley Subdivision - Stagecoach Road Ottawa (Greely), Ontario DATUM Grades interpolated based on topographic information by others. FILE NO.													
	d on to	pogra	aphic	inform	ation	by others	S.		FILE NO.	PH1276	I		
REMARKS				_		7 Decer	hor 0040		HOLE NO.	AH 5			
BORINGS BY Hand Auger	-		0.44	MPLE	DATE	7 Decem			aniat Dia				
SOIL DESCRIPTION	TOIT 1				N -	DEPTH (m)	ELEV. (m)		esist. Blo 0 mm Dia.		Piezometer Construction		
	STRATA	TYPE	NUMBER	& RECOVERY	N VALUE or RQD		:	0 N	Vater Cont	ent %	Piezo		
GROUND SURFACE	S		Z	RE	¤ °	0	-98.00	20	40 60	80			
TOPSOIL 0.2 SAND						1-	-97.00				¥		
End of Auger Hole (GWL @ 0.8m depth)								20 Shear ▲ Undistur	40 60 Strength	80 100 (kPa)	D		

patersongroup	SOIL PROFILE AND TEST DATA
• • •	
28 Concourse Gate Unit 1 Ottawa ON K2E 7T7	Ripley Subdivision - Stagecoach Road

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7					R	Forrain Analysis & Hydrogeological Study Ripley Subdivision - Stagecoach Road Ottawa (Greely), Ontario							
DATUM Grades interpolated bas	sed on to	opogra	aphic	inform	ation	ion by others. FILE NO. PH					5		
REMARKS									HOLE NO				
BORINGS BY Backhoe				D	ATE	28 Augus	st 2010			MW 1			
SOIL DESCRIPTION	PLOT		SAI	MPLE	1	DEPTH (m)	ELEV. (m)		esist. Blo 0 mm Dia		neter		
	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or ROD	(,		• v	tent %	Piezometer Construction			
GROUND SURFACE	N N		Z	RE	z °	- 0-	99.00	20	40 60	80			
TOPSOIL 0	.15						00.00						
Medium SAND , trace silt	20					1-	-98.00				<u> 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000</u>		
Brown SAND	00												
End of Monitoring Well						2⁼	-97.00						
(GWL @ 1.4m-Sept. 22/10)													
								20 Shea ▲ Undistu	40 60 r Strength urbed △ F	80 10 N (KPa) Remoulded	bo		

patersongroup	SOIL PROFILE AND TEST DATA
	Terrain Analysis & Hydrogeological Study
28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7	Ripley Subdivision - Stagecoach Road

28 Concours	se Gate, Unit 1, Ottawa		Ottawa (Greely), Ontario							
DATUM C	Grades interpolated ba	sed on to	pogra	aphic ii	nform	ation	by others	•		FILE NO.
REMARKS										HOLE NO.
BORINGS BY	Hand Auger		1		D	ATE	29 Augus	t 2010		
SOIL DESCRIPTION	LOT		SAN	IPLE		DEPTH	ELEV.		esist. Blov 60 mm Dia.	
301	L DESCRIPTION	LA PL	63	ĩR	ŝRΥ	Ea	(m)	(m)		iv min Dia.

PH1276

MW 3

Blows/0.3m

SOIL DESCRIPTION	PLOT		SA	MPLE		DEPTH		Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ভিন্ন
	STRATA P	TYPE	NUMBER	% RECOVERY	N VALUE or RQD	(m)	(m)	Pen. Resist. Blows/0.3m age of the second seco
GROUND SURFACE	LS		N	REC	N			20 40 60 80
	0					0.	99.20	
Red-brown SAND , trace silt								
<u>0.5</u> /								
Brown SAND						1-	98.20	
End of Monitoring Well	D 							
(GWL @ 1.2m-Sept. 22/10)								
								20 40 60 80 100
								Shear Strength (kPa) ▲ Undisturbed △ Remoulded
								L

Terrain Analysis & Hydrogeological Study Ripley Subdivision - Stagecoach Road

SOIL PROFILE AND TEST DATA

SOIL DESCRIPTION SOIL DESCRIPTION COPSOIL 0.20 Red-brown SAND, trace silt 0.50	PLOT			D	ATE (ł	IOLE	NO		H12		
SOIL DESCRIPTION SROUND SURFACE OPSOIL 0.20 Red-brown SAND, trace silt 0.50	PLOT															
SROUND SURFACE OPSOIL 0.20 Red-brown SAND, trace silt 0.50	PLOT					24 Noven	nber 2009			MW 7						
SROUND SURFACE OPSOIL 0.20 Red-brown SAND, trace silt 0.50			SAN	IPLE		DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone							Piezometer Construction	
OPSOIL 0.20	STRATA	ΡE	BER	overy •	N VALUE or RQD	(111)	(111)							0/	_	ezom nstru
OPSOIL 0.20	STR	TYPE	NUMBER	NECOVERY	N VP				0 20		ter (40	on. 60	tent	% 80		٥
Red-brown SAND , trace silt						0-	-100.90									
<u>0.5</u> C) 															
								,								
) 															n hindra Tableta
																n na serie e s En serie e serie
						1-	-99.90									annan Tanata
																III III III III III
Brown SAND																
						2-	-98.90									
														• • • • • •		
									<u>.</u>							
3.00						2_	-97.90									
nd of Monitoring Well						5	51,50									
GWL @ 1.4m-Sept. 22/10)																
				1				1 : :	: 1	: : :	1 : :	: 1	:::	1::	ΞĒ	
									20		10	60		80	10	

SOIL PROFILE AND TEST DATA Terrain Analysis & Hydrogeological Study

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

Ripley Subdivision - Stagecoach Road Ottawa (Greely), Ontario

DATUM Grades interpolated base	ed on to	pogra	aphic	inform	ation	by others			FILE NO. PH1276				
REMARKS				-		24 Novor	nhor 200	0	HOL	E NO.	MW 8		
BORINGS BY Backhoe	I		SAI	MPLE		24 Nover		Pen. R	esist.				
SOIL DESCRIPTION	A PLOT				Що	DEPTH (m)	ELEV. (m)	• 50 mm Dia. Cone				Piezometer Construction	
	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or RQD			• v	• Water Content %				
GROUND SURFACE			24	R	R A	0-	103.70	20	40	60 · · · · · ·	80		
TOPSOIL0.2	0												
Red-brown SAND, trace silt	0											្លុះជាក់ជាក់ទៅក្នុងទំនាក់ប្រាក់ជាក់ទោកក្នុងទៅក្នុងទៅក្នុងទៅក្នុងទៅក្នុងទាក់ក្រុង 111 	
<u>U</u> .										÷		1111111 ★ ₩1414111	
										*		ուրդուր անցեր	
						1-	-102.70					րիրիի ներեր	
												լիրիրի հերրի	
					1								
Brown SAND													
									•				
						2-	-101.70						
<u>3.0</u>	0					3-	-100.70						
End of Monitoring Well							100.10						
(GWL @ 0.6m depth)													
								20	40	60		00	
					-			Shea		ength (I ∆ Ren	k Pa) noulded		

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %				
Very Loose	<4	<15				
Loose	4-10	15-35				
Compact	10-30	35-65				
Dense	30-50	65-85				
Very Dense	>50	>85				

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value		
Very Soft	<12	<2		
Soft	12-25	2-4		
Firm	25-50	4-8		
Stiff	50-100	8-15		
Very Stiff	100-200	15-30		
Hard	>200	>30		

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their "sensitivity". The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called "mechanical breaks") are easily distinguishable from the normal in situ fractures.

RQD % ROCK QUALITY

90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard
		Penetration Test (SPT))

- TW Thin wall tube or Shelby tube
- PS Piston sample
- AU Auger sample or bulk sample
- WS Wash sample
- RC Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC% LL PL PI	- - -	Natural moisture content or water content of sample, % Liquid Limit, % (water content above which soil behaves as a liquid) Plastic limit, % (water content above which soil behaves plastically) Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Сс	-	Concavity coefficient = $(D30)^2 / (D10 \times D60)$
Cu	-	Uniformity coefficient = D60 / D10
Cc and	Cu are	used to assess the grading of sands and gravels:

Well-graded gravels have: 1 < Cc < 3 and Cu > 4Well-graded sands have: 1 < Cc < 3 and Cu > 4Well-graded sands have: 1 < Cc < 3 and Cu > 6Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded. Cc and Cu are not applicable for the description of soils with more than 10% silt and clay (more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

p'o	-	Present effective overburden pressure at sample depth
p'c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio)	Overconsolidaton ratio = p'_c / p'_o
Void Rat	io	Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k - Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

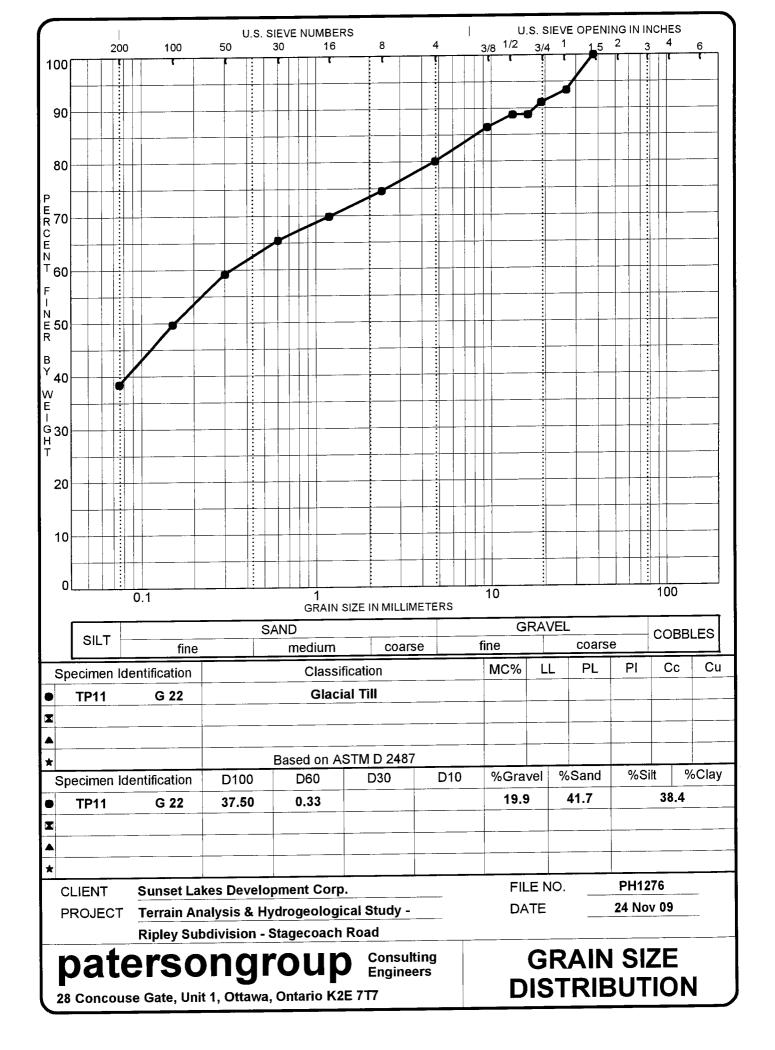
SYMBOLS AND TERMS (continued) STRATA PLOT Topsoil Asphalt Peat Sand Silty Sand Fill Δ Sandy Silt Clay Silty Clay Clayey Silty Sand Glacial Till Shale Bedrock

MONITORING WELL AND PIEZOMETER CONSTRUCTION









APPENDIX D

Water Quality Results and Lab Certificates

Summary of Test Well Water Quality Measurements

Parameter	Units	TWA-3hr 11/08/2023 10:30 AM	TW A TWA-6hr 11/08/2023 11:30 AM	TWA-6hr 11/08/2023 12:30 PM	TWB-3hr 11/02/2023 11:15 AM	TW B TWB-6hr 11/02/2023 02:15 PM	TWB-6hr 11/02/2023 02:15 PM	TWC-3hr 10/30/2023 01:00 PM	TW C TWC-6hr 10/30/2023 04:00 PM	TWC-6hr 10/30/2023 04:00 PM	TWD-3hr 10/30/2023 01:00 PM	TW D TWD-6hr 10/30/2023 04:00 PM	TWD-6hr 10/30/2023 04:00 PM	TWE-3hr 10/30/2023 01:00 PM	TW E TWE-6hr 10/30/2023 04:00 PM	TWE-6hr 10/30/2023 04:00 PM	Ontario Drinking Water Standard	Type of Standard
Microbiological Parameters			11100741			0211011		011001111	0110011			011001111		0110011	0110011		otandara	
E. Coli	CFU/100mL	ND (1)	ND (1)	NA	0	MAC												
Total Coliforms	CFU/100mL	ND (1)	ND (1)	NA	1	ND (1)	NA	14	8	NA	ND (1)	ND (1)	NA	3	10	NA	_	-
Fecal Coliforms	CFU/100mL	ND (1)	ND (1)	NA	0	MAC												
Heterotrophic Plate Count	CFU/mL	30	ND (10)	NA	ND (10)	ND (10)	NA	10	20	NA	60	30	NA	20	10	NA	_	-
General Inorganics			(- /			(- /												
Alkalinity, total	mg/L	218	232	NA	353	352	NA	249	249	NA	267	268	NA	238	238	NA	30-500	OG
Ammonia as N	mg/L	0.27	0.20	NA	ND (0.01)	0.02	NA	0.13	0.11	NA	0.20	0.19	NA	0.12	0.08	NA	-	-
Dissolved Organic Carbon	mg/L	1.4	1.2	NA	1.4	1.4	NA	1.2	1.2	NA	1.5	1.6	NA	1.0	0.7	NA	10	MAC
Colour	TCU	2	ND (2)	NA	ND (2)	ND (2)	NA	2	2	NA	ND (2)	ND (2)	NA	2	ND (2)	NA	5	AO
Colour, apparent	ACU	28	23	NA	17	15	NA	9	9	NA	37	28	NA	33	32	NA	5	AO
Conductivity	uS/cm	737	826	NA	1540	1480	NA	724	752	NA	1030	1020	NA	758	751	NA	80-100	OG
Hardness	mg/L	300	326	NA	469	465	NA	345	342	NA	373	388	NA	356	362	NA	-	-
pH	pH Units	8.3	8.3	NA	7.9	7.9	NA	8.0	8.0	NA	8.0	8.0	NA	8.1	8.1	NA	6.5-8.5	OG
Phenolics	mg/L	ND (0.001)	ND (0.001)	NA	500	AO												
Total Dissolved Solids	mg/L	432	476	NA	916	900	NA	422	426	NA	562	588	NA	416	410	NA	500	AO
Sulphide	mg/L	ND (0.02)	ND (0.02)	NA	-	-												
Tannin & Lignin	mg/L	ND (0.1)	ND (0.1)	NA	-	-												
Total Kjeldahl Nitrogen	mg/L	0.3	0.2	NA	0.2	0.2	NA	0.1	0.2	NA	0.3	0.3	NA	0.2	0.1	NA		
Turbidity	NTU	3.1	2.3	NA	2.2	2.0	NA	1.0	0.8	NA	5.0	3.7	NA	5.5	5.2	NA	5	AO
Anions																		
Chloride	mg/L	85	99	NA	246	243	NA	61	61	NA	140	143	NA	68	68	NA	250	AO
Fluoride	mg/L	0.2	0.1	NA	ND (0.1)	ND (0.1)	NA	ND (0.1)	ND (0.1)	NA	0.1	0.1	NA	0.1	0.1	NA	1.5	MAC
Nitrate as N	mg/L	ND (0.1)	ND (0.1)	NA	1.8	1.6	NA	ND (0.1)	ND (0.1)	NA	ND (0.1)	ND (0.1)	NA	ND (0.1)	ND (0.1)	NA	10(4)	MAC
Nitrite as N	mg/L	ND (0.05)	ND (0.05)	NA	1.0(4)	MAC												
Sulphate	mg/L	50	60	NA	123	125	NA	68	68	NA	82	83	NA	65	64	NA	500	AO
Metals	5																	
Mercury	mg/L	NA	NA	ND (0.0001)	NA	NA	ND (0.0001)	NA	NA	ND (0.0001)	NA	ND (0.0001)	ND (0.0001)	NA	ND (0.0001)	ND (0.0001)	0.001	
Aluminum	mg/L	NA	0.135	0.019	NA	0.006	ND (0.001)	NA	0.003	ND (0.001)	NA	0.062	0.003	NA	0.087	0.002	0.1	OG
Antimony	mg/L	NA	ND (0.0005)	ND (0.0005)	0.006	MAC												
Arsenic	mg/L	NA	ND (0.001)	ND (0.001)	0.025	MAC												
Barium	mg/L	NA	0.218	0.211	NA	0.143	0.138	NA	0.157	0.155	NA	0.212	0.206	NA	0.152	0.147	1	MAC
Beryllium	mg/L	NA	ND (0.0005)	ND (0.0005)	-	-												
Boron	mg/L	NA	0.09	0.09	NA	0.05	0.04	NA	0.02	0.02	NA	0.07	0.07	NA	0.04	0.04	5	MAC
Cadmium	mg/L	NA	ND (0.0001)	ND (0.0001)	0.005	MAC												
Calcium	mg/L	62.6	68.3	67.4	121	120	119	71.3	70.9	70.2	82.5	84.9	95.2	75.7	74.3	76.1	-	-
Chromium	mg/L	NA	ND (0.001)	ND (0.001)	0.05	MAC												
Cobalt	mg/L	NA	ND (0.0005)	ND (0.0005)	NA	0.0049	0.0049	NA	ND (0.0005)	ND (0.0005)	NA	ND (0.0005)	ND (0.0005)	NA	ND (0.0005)	ND (0.0005)	-	-
Copper	mg/L	MA	ND (0.0005)	0.0009	NA	0.0006	0.0006	NA	ND (0.0005)	ND (0.0005)	NA	ND (0.0005)	0.0005	NA	ND (0.0005)	ND (0.0005)	1	AO
Iron	mg/L	0.2	0.2	0.1	0.2	0.2	ND (0.1)	0.2	0.2	0.2	0.3	0.4	0.3	0.4	0.4	0.3	0.3	AO
Lead	mg/L	NA	0.0002	ND (0.0001)	NA	0.0004	0.0003	NA	ND (0.0001)	ND (0.0001)	NA	ND (0.0001)	ND (0.0001)	NA	0.0001	ND (0.0001)	0.01	MAC
Magnesium	mg/L	35.0	37.7	36.6	40.7	40.1	40.4	40.6	40.1	38.6	40.6	42.7	46.0	40.5	42.9	41.5	-	-
Manganese	mg/L	0.026	0.028	0.029	0.032	0.032	0.031	0.026	0.027	0.026	0.029	0.029	0.031	0.026	0.025	0.024	0.05	AO
Molybdenum	mg/L	NA	0.0192	0.0192	NA	0.0667	0.0683	NA	0.0041	0.0040	NA	0.0062	0.0072	NA	0.0085	0.0087	-	-
Nickel	mg/L	NA	ND (0.001)	ND (0.001)	NA	0.021	0.021	NA	ND (0.001)	ND (0.001)	NA	ND (0.001)	ND (0.001)	NA	ND (0.001)	ND (0.001)	-	-
Potassium	mg/L	5.6	5.9	5.7	4.6	4.6	4.5	2.5	2.5	2.5	6.3	6.3	7.5	3.4	3.5	3.4	-	-
Selenium	mg/L	NA	ND (0.001)	ND (0.001)	0.01	MAC												
Silver	mg/L	NA	ND (0.0001)	ND (0.0001)	-	-												
Sodium	mg/L	41.2	47.5	48.2	130	126	128	14.2	14.2	13.7	61.4	61.9	68.4	37.1	37.3	36.2	200 (20) ¹	AO
Strontium	mg/L	NA	1.46	1.44	NA	0.44	0.43	NA	0.53	0.52	NA	1.04	1.11	NA	0.54	0.53	-	-
Thallium	mg/L	NA	ND (0.001)	ND (0.001)	-	-												
Uranium	mg/L	NA	0.0004	0.0004	NA	0.0042	0.0040	NA	0.0002	0.0002	NA	0.0002	0.0002	NA	0.0003	0.0003	0.02	MAC
Vanadium	mg/L	NA	ND (0.0005)	ND (0.0005)	-	-												
Zinc	mg/L	NA	ND (0.005)	ND (0.005)	NA	ND (0.005)	0.007	5	AO									

Notes:

NA: Not Analyzed

ND: Non-Detect

MAC: Maximum Acceptable Concentration

AO: Aesthetic Objective

OG: Operational Guideline

1 - The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of

Health should be notified when the sodium concentration exceeds 20 mg/L so that this

information may be communicated to local physicians for their use with patients on sodium

restricted diets.



		PW-1794	PW-1826	PW-1850	PW-1858	PW-1922	PW-6266	PW-6342		
Parameter	Units	11/08/2023 10:30 AM	11/08/2023 11:30 AM	11/08/2023 12:30 PM	11/08/2023 01:30 PM	11/08/2023 02:30 PM	11/28/2023 10:30 AM	11/28/2023 11:30 AM	Ontario Drinking Water Standard	Type of Standard
Microbiological Parameters									·	
E. Coli	CFU/100mL	ND (1)	0	MAC						
Total Coliforms	CFU/100mL	ND (1)	-	-						
Fecal Coliforms	CFU/100mL	ND (1)	0	MAC						
Heterotrophic Plate Count	CFU/mL	ND (10)	ND (10)	100	10	220	90	ND (10)	-	-
General Inorganics										
Alkalinity, total	mg/L	299	288	304	281	247	324	295	30-500	OG
Ammonia as N	mg/L	0.05	0.07	0.06	0.06	0.08	0.12	0.18	-	-
Dissolved Organic Carbon	mg/L	1.1	1	1	1.1	1.3	6.2	3.8	10	MAC
Colour	TCU	2	ND (2)	ND (2)	ND (2)	ND (2)	6	3	5	AO
Colour, apparent	ACU	228	28	159	85	120	167	92	5	AO
Conductivity	uS/cm	1420	1400	916	1380	1230	1090	963	80-100	OG
Hardness	mg/L	474	468	434	458	421	415	359	-	-
pН	pH Units	7.6	7.7	7.8	7.7	7.8	7.7	7.8	6.5-8.5	OG
Phenolics	mg/L	0.001	ND (0.001)	500	AO					
Total Dissolved Solids	mg/L	844	788	534	764	678	672	534	500	AO
Sulphide	mg/L	0.05	ND (0.02)	0.04	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	-	-
Tannin & Lignin	mg/L	0.2	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.3	0.1		-
Total Kjeldahl Nitrogen	mg/L	0.1	0.1	0.1	0.2	0.1	0.3	0.3		
Turbidity	NTU	45.4	3.8	26.7	13.5	19.4	19.2	11.8	5	AO
Anions										
Chloride	mg/L	245	237	84	231	205	125	96	250 1.5	AO
Fluoride	mg/L	ND (0.1)	10(4)	MAC						
Nitrate as N	mg/L	ND (0.1)	1.0(4)	MAC						
Nitrite as N	mg/L	ND (0.05)	500	MAC						
Sulphate	mg/L	119	118	76	113	105	98	81		AO
Metals										
Calcium	mg/L	116	112	93.9	109	99.2	109	95.3	-	-
Iron	mg/L	2.6	0.4	2	1	1.4	1.8	1.1	0.3	AO
Magnesium	mg/L	44.5	45.7	48.5	45.1	42	34.6	29.4	-	-
Manganese	mg/L	0.042	0.031	0.039	0.034	0.041	0.228	0.116	0.05	AO
Potassium	mg/L	4.6	5.1	2.9	4.1	4.2	1.9	2.1	-	-
Sodium	mg/L	128	113	21	117	90	51.4	46.9	200 (20) ¹	AO

NA: Not Analyzed

ND: Non-Detect

MAC: Maximum Acceptable Concentration

AO: Aesthetic Objective

OG: Operational Guideline

1 - The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.



Summary of Monitoring Well Water Quality Measurements

		MW23-1		MM	/23-2	MW	23-3		
Parameter	Units	09/25/2023 01:00 PM	10/27/2023 09:00 AM	09/25/2023 02:13 PM	10/27/2023 09:00 AM	09/25/2023 11:53 AM	10/27/2023 09:00 AM	Ontario Drinking Water Standard	Type of Standard
General Inorganics									
Ammonia as N	mg/L	ND (0.01)	NA	0.12	NA	0.06	NA	10	MAC
Total Kjeldahl Nitrogen	mg/L	0.2	NA	1.6	NA	1.3	NA		
Anions									
Nitrate as N	mg/L	3.4	2.6	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	10	MAC
Nitrite as N	mg/L	ND (0.05)	0.09	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	1	MAC

Notes: NA: Not Analyzed

ND: Non-Detect

MAC: Maximum Acceptable Concentration



Test Well ID	Date	Time Since Initiaion of Pump (hrs)	Temp (°C)	рН	Electrical Conductivity (µS/cm)	Total Dissolved Solids (ppm)	Turbidity (NTU)	Colour (ACU ¹)	Colour (ACU ²)	Free Chlorine (mg/L)	Total Chlorine (mg/L)
TW A	31-Oct-23	3	7.5	7.78	727	304	4.38	0	-	-	0.05
	31-001-23	6	6.9	7.97	794	396	3.66	0	-	-	0
TW B	2-Nov-23	3	8.5	7.87	1314	655	1.91	2	0	-	0
	2-1100-23	6	8.6	7.7	1303	651	1.86	-	-	-	0
TW C	30-Oct-23	3	7.3	7.71	671	336	0.9	3	-	-	0.01
	30-001-23	6	8.1	7.96	647	324	0.75	-	-	-	-
TW D	25-Oct-23	3	10.1	7.44	1006	498	-	1	0	-	0
	25-001-25	6	9.8	7.54	1021	511	318	23	0	-	0
TW E	7-Nov-23	3	8.1	7.78	620	316	5.44	6	0	0	0
	7-INOV-23	6	8.6	7.89	628	314	4.28	7	0	0	0

1. ACU = Actual Colour Units

2. Field filtered using 0.45 micron filter



Test Well ID	Date	Time Purging (min)	Temp (°C)	рН	Electrical Conductivity (µS/cm)	Total Dissolved Solids (ppm)	Turbidity (NTU)	Colour (ACU ¹)	Colour (ACU ²)	Free Chlorine (mg/L)	Total Chlorine (mg/L)
PW-1922	8-Nov-23	10	9.62	7.78	1360	872	0	-	-	-	-
F VV-1922	0-1100-23	15	9.61	7.81	1350	864	0.3	-	-	-	0
PW-1826	8-Nov-23	10	11.23	8.17	1230	966	1.4	-	-	-	-
F VV-1020	0-1100-23	15	11.51	8.01	1510	936	1.4	-	-	-	0
PW-1858	8-Nov-23	10	8.84	7.41	1160	939	1.4	-	-	-	-
FVV-1000	0-1100-23	15	8.66	7.33	1460	940	0.7	-	-	-	0
PW-1850	8-Nov-23	10	10.01	7.8	997	651	3.4	-	-	-	-
FVV-1000	0-1100-23	15	9.35	7.67	981	629	2.3	0	-	-	0
PW-1794	8-Nov-23	10	11.59	8.62	1620	1041	1.5	-	-	-	-
PVV-1794	0-1100-23	15	11.2	8.51	1590	1021	1.2	-	-	-	0
	28-Nov-23	10	9.5	7.64	950	474	1.31	0	-	-	0
PW-6342	20-1100-23	15	-	7.67	926	467	1.07	0	-	-	0
	29 Nov 22	10	8.8	7.48	1180	571	1.75	0	-	-	0
PW-6266	28-Nov-23	15	8.7	7.58	1098	550	1.52	0	-	-	0

1. ACU = Actual Colour Units

2. Field filtered using 0.45 micron filter



Test Well ID	Date	Time Since Initiaion of Pump (min)	Temp (°C)	рН	Electrical Conductivity (µS/cm)	Total Dissolved Solids (ppm)	Turbidity (NTU)	Colour (ACU ¹)	Colour (ACU ²)	Free Chlorine (mg/L)	Total Chlorine (mg/L)
MW23-1	25-Sep-23	25	14.8	7.47	2517	1271	-	-	-	-	-
MW23-2	25-Sep-23	3	13	8.42	530	259	-	-	-	-	-
MW23-3	25-Sep-23	4.5	12.5	7.63	950	460	-				

1. ACU = Actual Colour Units

2. Field filtered using 0.45 micron filter



LAB CERTIFICATES

Relating Report IDs to Lab Sample IDs

Report ID	Lab Sample ID
TW A	TW1
TW B	TW2
TW C	TW3
TW D	TW4
TW E	TW5
MW23-01	MW1
MW23-02	MW2
MW23-03	MW3



100554.003 December 2023



TW1-3hr

TW1-6hr

TW1-6hr (Filtered)

1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Brent Redmond	Report Date: 7-Nov-2023
Client PO:	Order Date: 1-Nov-2023
Project: 100554.003	Order #: 2344227
Custody: 1596	Order #. 2344227
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	
Paracel ID Client ID	

Approved By:

2344227-01 2344227-02

2344227-03

Slose

Dale Robertson, BSc

Laboratory Director



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis Summary Table

Report Date: 07-Nov-2023

Order Date: 1-Nov-2023

Project Description: 100554.003

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	3-Nov-23	3-Nov-23
Ammonia, as N	EPA 351.2 - Auto Colour	2-Nov-23	2-Nov-23
Anions	EPA 300.1 - IC	1-Nov-23	1-Nov-23
Colour	SM2120 - Spectrophotometric	2-Nov-23	2-Nov-23
Colour, apparent	SM2120 - Spectrophotometric	2-Nov-23	2-Nov-23
Conductivity	EPA 9050A- probe @25 °C	3-Nov-23	3-Nov-23
Dissolved Organic Carbon	MOE 3247B - Combustion IR	1-Nov-23	2-Nov-23
E. coli	MOE E3407	1-Nov-23	1-Nov-23
Fecal Coliform	SM 9222D	1-Nov-23	1-Nov-23
Heterotrophic Plate Count	SM 9215C	1-Nov-23	1-Nov-23
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	7-Nov-23	7-Nov-23
Metals, ICP-MS	EPA 200.8 - ICP-MS	1-Nov-23	2-Nov-23
рН	EPA 150.1 - pH probe @25 °C	3-Nov-23	3-Nov-23
Phenolics	EPA 420.2 - Auto Colour, 4AAP	2-Nov-23	2-Nov-23
Hardness	Hardness as CaCO3	1-Nov-23	2-Nov-23
Sulphide	SM 4500SE - Colourimetric	3-Nov-23	6-Nov-23
Tannin/Lignin	SM 5550B - Colourimetric	6-Nov-23	6-Nov-23
Total Coliform	MOE E3407	1-Nov-23	1-Nov-23
Total Dissolved Solids	SM 2540C - gravimetric, filtration	4-Nov-23	6-Nov-23
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	2-Nov-23	3-Nov-23
Turbidity	SM 2130B - Turbidity meter	1-Nov-23	1-Nov-23

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 07-Nov-2023

Order Date: 1-Nov-2023

Project Description: 100554.003

	Client ID:	TW1-3hr	TW1-6hr	TW1-6hr (Filtered)			
	Sample Date:	31-Oct-23 13:00	31-Oct-23 15:30	31-Oct-23 15:30	-		
	Sample Date: Sample ID:	2344227-01	2344227-02	2344227-03	-	-	-
	Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
	MDL/Units	Drinking Water	Drinking Water	Drinking Water			
Microbiological Parametero	MDL/Onits						
Microbiological Parameters E. coli	1 CFU/100mL	ND	ND	-	_		-
	1 CFU/100mL					-	
Total Coliforms		ND	ND	-	-	-	-
Fecal Coliforms	1 CFU/100mL	ND	ND	-	-	-	-
Heterotrophic Plate Count	10 CFU/mL	30	<10	-	-	-	-
General Inorganics							
Alkalinity, total	5 mg/L	218	232	-	-	-	-
Ammonia as N	0.01 mg/L	0.27	0.20	-	-	-	-
Dissolved Organic Carbon	0.5 mg/L	1.4	1.2	-	-	-	-
Colour, apparent	2 ACU	28	23	-	-	-	-
Colour	2 TCU	2	<2	-	-	-	-
Conductivity	5 uS/cm	737	826	-	-	-	-
Hardness	mg/L	300	326	-	-	-	-
рН	0.1 pH Units	8.3	8.3	-	-	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-	-	-
Total Dissolved Solids	10 mg/L	432	476	-	-	-	-
Sulphide	0.02 mg/L	<0.02	<0.02	-	-	-	-
Tannin & Lignin	0.1 mg/L	<0.1	<0.1	-	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.3	0.2	-	-	-	-
Turbidity	0.1 NTU	3.1	2.3	-	-	-	-
Anions							
Chloride	1 mg/L	85	99	-	-	-	-
Fluoride	0.1 mg/L	0.2	0.1	-	-	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-	-	-
Sulphate	1 mg/L	50	60	-	-	-	-

OTTAWA - MISSISSAUGA - HAMILTON - KINGSTON - LONDON - NIAGARA - WINDSOR - RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 07-Nov-2023

Order Date: 1-Nov-2023

Project Description: 100554.003

	Client ID:	TW1-3hr	TW1-6hr	TW1-6hr (Filtered)	-		
	Sample Date:	31-Oct-23 13:00	31-Oct-23 15:30	31-Oct-23 15:30	-	-	-
	Sample ID:	2344227-01	2344227-02	2344227-03	-		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
	MDL/Units						
Metals				•			
Mercury	0.0001 mg/L	-	-	<0.0001	-	-	-
Aluminum	0.001 mg/L	-	0.135	0.019	-	-	-
Antimony	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Arsenic	0.001 mg/L	-	<0.001	<0.001	-	-	-
Barium	0.001 mg/L	-	0.218	0.211	-	-	-
Beryllium	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Boron	0.01 mg/L	-	0.09	0.09	-	-	-
Cadmium	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Calcium	0.1 mg/L	62.6	68.3	67.4	-	-	-
Chromium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Cobalt	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Copper	0.0005 mg/L	-	<0.0005	0.0009	-	-	-
Iron	0.1 mg/L	0.2	0.2	0.1	-	-	-
Lead	0.0001 mg/L	-	0.0002	<0.0001	-	-	-
Magnesium	0.2 mg/L	35.0	37.7	36.6	-	-	-
Manganese	0.005 mg/L	0.026	0.028	0.029	-	-	-
Molybdenum	0.0005 mg/L	-	0.0192	0.0192	-	-	-
Nickel	0.001 mg/L	-	<0.001	<0.001	-	-	-
Potassium	0.1 mg/L	5.6	5.9	5.7	-	-	-
Selenium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Silver	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Sodium	0.2 mg/L	41.2	47.5	48.2	-	-	-
Strontium	0.01 mg/L	-	1.46	1.44	-	-	-
Thallium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Uranium	0.0001 mg/L	-	0.0004	0.0004	-	-	-

OTTAWA - MISSISSAUGA - HAMILTON - KINGSTON - LONDON - NIAGARA - WINDSOR - RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Metals

Report Date: 07-Nov-2023

Order Date: 1-Nov-2023

Project Description: 100554.003

Client ID:	TW1-3hr	TW1-6hr	TW1-6hr (Filtered)	-		
Sample Date:	31-Oct-23 13:00	31-Oct-23 15:30	31-Oct-23 15:30	-	-	-
Sample ID:	2344227-01	2344227-02	2344227-03	-		
Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
MDL/Units						

Vanadium	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Zinc	0.005 mg/L	-	<0.005	<0.005	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Blank

Report Date: 07-Nov-2023

Order Date: 1-Nov-2023

Project Description: 100554.003

AnionsND1 mg/L ChiorideND0.1 mg/L FluorideND0.1 mg/L Nitrate as NND0.05 mg/L SulphateND1 mg/L General Inorganics mg/L Atkalinity, totalND5 mg/L Alkalinity, totalND0.01 mg/L Colour, apparentND2TCUColour, apparentND2ACUConductivityND5 uS/cm PhenolicsND0.001 mg/L Total Dissolved SolidsND0.01 mg/L Total Dissolved SolidsND0.01 mg/L Total Kjeldahl NitrogenND0.1 mg/L MercuryND0.001 mg/L AntimornND0.001 mg/L AntimornND0.001 mg/L AntimornND0.001 mg/L BaiumND0.001 mg/L BaiumND0.001 mg/L BaiumND0.001 mg/L BaiumND0.001 mg/L BariumND0.001 mg/L BariumND0.001<	Notes	RPD Limit	RPD	%REC Limit	%REC	Units	Reporting Limit	Result	Analyte
Fluoride ND 0.1 mg/L Nitrale as N ND 0.1 mg/L Sulphate ND 0.05 mg/L Sulphate ND 1 mg/L General Inorganics ND 0.01 mg/L Aklainity, total ND 0.01 mg/L Object Organic Carbon ND 0.05 mg/L Colour ND 2 RCU Colour, apparent ND 0.01 mg/L Colour Colour ND 5 uS/cm Phenolics ND 0.01 mg/L Colour Colurity ND 0.02 mg/L Sulphide ND 0.02 mg/L Total Kjeldah Nitrogen ND 0.01 mg/L Turbidty ND 0.001 mg/L Auminum ND 0.001 mg/L Autimum ND 0.001 mg/L Autimum ND 0.001 mg/L Aut									Anions
Nitrate as N ND 0.1 mg/L Nitrite as N ND 0.05 mg/L Sulphate ND 1 mg/L General Iorganics ND 5 mg/L Ammonia as N ND 0.1 mg/L Dissolved Organic Carbon ND 0.5 mg/L Colour ND 2 CU Colour apparent ND 2 ACU Conductivity ND 0.001 mg/L Total Dissolved Solids ND 0.001 mg/L Sulphide ND 0.01 mg/L Total Dissolved Solids ND 0.01 mg/L Sulphide ND 0.1 mg/L Total Kigdnin ND 0.1 mg/L Total Kigdnin ND 0.01 mg/L Autiminum ND 0.001 mg/L Autimutified ND 0.001 mg/L Autimutified ND 0.001 mg/L						mg/L	1	ND	Chloride
Nitrite as N ND 0.05 mg/L Sulphate ng/L mg/L General Inorganics mg/L Akalinity, total ND 0.01 mg/L Ammonia as N ND 0.01 mg/L Dissolved Organic Carbon ND 0.5 mg/L Colour, apparent ND 2 TCU Colour, apparent ND 0.001 mg/L Phenolics ND 0.001 mg/L Sulphide ND 0.001 mg/L Sulphide ND 0.001 mg/L Sulphide ND 0.001 mg/L Tatal Dissolved Solids ND 0.1 mg/L Sulphide ND 0.1 mg/L Tatal Dissolved Solids ND 0.1 mg/L Tatal Dissolved Solids ND 0.1 mg/L Auminum ND 0.001 mg/L Autimony ND 0.001 mg/L Aritimo						mg/L	0.1	ND	Fluoride
Sulphate ND 1 mg/L General Inorganics ND 5 mg/L Aklaninty, Itodal ND 0.01 mg/L Dissolved Organic Carbon ND 0.5 mg/L Colour, apparent ND 2 CU Colout, apparent ND 0.01 mg/L Sulphide ND 0.01 mg/L Sulphide ND 0.01 mg/L Sulphide ND 0.02 mg/L Sulphide ND 0.02 mg/L Sulphide ND 0.02 mg/L Sulphide ND 0.02 mg/L Sulphide ND 0.01 mg/L Sulphide ND 0.1 mg/L Turki Utrogen ND 0.01 mg/L Aluminum ND 0.001 mg/L Aluminum ND 0.001 mg/L Arisino ND 0.001 mg/L Beruium ND </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>mg/L</td> <td>0.1</td> <td>ND</td> <td>Nitrate as N</td>						mg/L	0.1	ND	Nitrate as N
General Inorganics Alkalinty, total ND 5 mg/L Ammonia as N ND 0.01 mg/L Dissolved Organic Carbon ND 2 TCU Colour ND 2 TCU Conductivity ND 2 ACU Conductivity ND 5 uS/cm Phenolics ND 0.001 mg/L Total Dissolved Solids ND 10 mg/L Sulphide ND 0.02 mg/L Total Dissolved Solids ND 0.1 mg/L Total Kjeldah Nitrogen ND 0.1 mg/L Turbidty ND 0.001 mg/L Aluminum ND 0.001 mg/L Aluminum ND 0.001 mg/L Arsenic ND 0.001 mg/L Barium 0.001 mg/L Berylium ND 0.001 mg/L Berylium ND 0.001 mg/L Berylium ND 0.001 mg/L <td< td=""><td></td><td></td><td></td><td></td><td></td><td>mg/L</td><td>0.05</td><td>ND</td><td>Nitrite as N</td></td<>						mg/L	0.05	ND	Nitrite as N
Alkalinity, tota ND 5 mg/L Ammonia as N ND 0.01 mg/L Dissolved Organic Carbon ND 0.5 mg/L Colour, apparent ND 2 TCU Colour, apparent ND 5 uS/cm Phenolics ND 0.001 mg/L Total Dissolved Solids ND 0.02 mg/L Sulphide ND 0.02 mg/L Total Dissolved Solids ND 0.02 mg/L Sulphide ND 0.1 mg/L Total Kieghah Nitrogen ND 0.1 mg/L Total Kieghah Nitrogen ND 0.1 mg/L Mercury ND 0.001 mg/L Aluminum ND 0.001 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Beryllium ND 0.001 mg/L Boron ND 0.001 mg/L						mg/L	1	ND	Sulphate
Alkalinity, total ND 5 mg/L Ammonia as N ND 0.01 mg/L Dissolved Organic Carbon ND 0.5 mg/L Colour ND 2 TCU Colour, apparent ND 2 ACU Conductivity ND 5 uS/cm Phenolics ND 0.001 mg/L Sulphide ND 0.02 mg/L Sulphide ND 0.02 mg/L Total Dissolved Solids ND 0.1 mg/L Sulphide ND 0.1 mg/L Total Kiegdahl Nitrogen ND 0.1 mg/L Total VisioName ND 0.1 mg/L Mercury ND 0.1 mg/L Aluminum ND 0.001 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Barium ND 0.001 mg/L Boron									General Inorganics
Dissolved Organic Carbon ND 0.5 mg/L Colour ND 2 TCU Colour, apparent ND 2 ACU Conductivity ND 5 uS/cm Phenolics ND 0.001 mg/L Total Dissolved Solids ND 0.02 mg/L Sulphide ND 0.1 mg/L Total Kignin ND 0.1 mg/L Turkidfy ND 0.1 mg/L Atuminum ND 0.0001 mg/L Aluminum ND 0.0005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Beryllium ND 0.005 mg/L Boron ND 0.001 mg/L Cadmium						mg/L	5	ND	
ColourND2TCUColour, apparentND2ACUConductivityND5US/cmPhenolicsND0.01mg/LTotal Dissolved SolidsND0.02mg/LSulphideND0.02mg/LTanin & LigninND0.1mg/LTurkiftyND0.1mg/LTurkiftyND0.1mg/LMercuryND0.001mg/LAluminumND0.001mg/LAntimonyND0.001mg/LBarlumND0.001mg/LBerylliumND0.001mg/LBoronND0.001mg/LCadmiumND0.001mg/LBoronND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/L<						mg/L	0.01	ND	Ammonia as N
Colour, apparentND2ACUConductivityND5uS/cmPhenolicsND0.001mg/LTotal Dissolved SolidsND10mg/LSulphideND0.02mg/LTannin & LigninND0.1mg/LTotal Kjeldahl NitrogenND0.1mg/LTurbidityND0.1NTUHercuryAluminumND0.001mg/LAluminumND0.001mg/LArsenicND0.001mg/LBergiumND0.001mg/LBergiumND0.001mg/LConductionND0.001mg/LBergiumND0.001mg/LBergiumND0.001mg/LBergiumND0.001mg/LCadmiumND0.001mg/LBoronND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.01mg/LCadmiumND0.01mg/LCadmiumND0.01mg/LCadmiumND0.01mg/LCadmiumND0.01mg/LCadmiumND0.01mg/LCadmiumND0.01mg/LCadmi						mg/L	0.5	ND	Dissolved Organic Carbon
ConductivityND5uS/cmPhenolicsND0.001mg/LTotal Dissolved SolidsND10mg/LSulphideND0.02mg/LTanin & LigninND0.1mg/LTotal Kjeldahl NitrogenND0.1mg/LMercuryND0.001mg/LAluminumND0.001mg/LArtimonyND0.001mg/LArtimonyND0.001mg/LBeruinuND0.001mg/LBariumND0.001mg/LBoronND0.001mg/LCodmiumND0.001mg/LBoronND0.001mg/LCadmiumND0.001mg/LBoronND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCadmiumND0.01mg/LCadmiumND0.01mg/LCadmiumND0.01mg/LCadmiumND0.01mg/L						TCU	2	ND	Colour
Phenolics ND 0.001 mg/L Total Dissolved Solids ND 10 mg/L Sulphide ND 0.02 mg/L Tanin & Lignin ND 0.1 mg/L Total Kjeldah Nitrogen ND 0.1 mg/L Turbidity ND 0.1 mg/L Metals ND 0.001 mg/L Auminum ND 0.001 mg/L Aluminum ND 0.001 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Beryllium ND 0.001 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L						ACU	2	ND	Colour, apparent
Total Dissolved Solids ND 10 mg/L Sulphide ND 0.02 mg/L Tannin & Lignin ND 0.1 mg/L Total Kjeldahl Nitrogen ND 0.1 mg/L Turbidity ND 0.1 NTU Metals Aluminum ND 0.001 mg/L Antimony ND 0.001 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L						uS/cm	5	ND	Conductivity
Sulphide ND 0.02 mg/L Tannin & Lignin ND 0.1 mg/L Total Kjeldahl Nitrogen ND 0.1 mg/L Turbidity ND 0.1 NTU Metals ND 0.001 mg/L Aluminum ND 0.001 mg/L Antimony ND 0.001 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L						mg/L	0.001	ND	Phenolics
Tanin & Lignin ND 0.1 mg/L Total Kjeldahl Nitrogen ND 0.1 mg/L Turbidity ND 0.1 NTU Metals ND 0.001 mg/L Aluminum ND 0.001 mg/L Antimony ND 0.005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.001 mg/L Boron ND 0.005 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L						mg/L	10	ND	Total Dissolved Solids
Tannin & Lignin ND 0.1 mg/L Total Kjeldahl Nitrogen ND 0.1 mg/L Turbidity ND 0.1 NTU Metals ND 0.001 mg/L Aluminum ND 0.001 mg/L Arsenic ND 0.005 mg/L Barium ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.005 mg/L Gadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L						mg/L	0.02	ND	Sulphide
TurbidityND0.1NTUMetalsND0.0001mg/LAluminumND0.001mg/LAntimonyND0.005mg/LArsenicND0.001mg/LBariumND0.001mg/LBoronND0.005mg/LBoronND0.01mg/LCadmiumND0.01mg/LCadmiumND0.001mg/LCalciumND0.001mg/LCalciumND0.001mg/L						mg/L	0.1	ND	Tannin & Lignin
Metals Mercury ND 0.0001 mg/L Aluminum ND 0.001 mg/L Antimony ND 0.005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.005 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.0001 mg/L						mg/L	0.1	ND	Total Kjeldahl Nitrogen
MercuryND0.001mg/LAluminumND0.001mg/LAntimonyND0.005mg/LArsenicND0.001mg/LBariumND0.005mg/LBerylliumND0.005mg/LBoronND0.001mg/LCadmiumND0.001mg/LCadmiumND0.001mg/LCalciumND0.001mg/L						NTU	0.1	ND	Turbidity
Aluminum ND 0.001 mg/L Antimony ND 0.0005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Beryllium ND 0.005 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Calcium ND 0.001 mg/L									Metals
Antimony ND 0.0005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Beryllium ND 0.0005 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Calcium ND 0.001 mg/L						mg/L	0.0001	ND	
Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Beryllium ND 0.005 mg/L Boron ND 0.01 mg/L Cadmium ND 0.001 mg/L Calcium ND 0.001 mg/L						mg/L	0.001	ND	Aluminum
Barium ND 0.001 mg/L Beryllium ND 0.0005 mg/L Boron ND 0.01 mg/L Cadmium ND 0.001 mg/L Calcium ND 0.1 mg/L						mg/L	0.0005	ND	Antimony
Beryllium ND 0.0005 mg/L Boron ND 0.01 mg/L Cadmium ND 0.001 mg/L Calcium ND 0.1 mg/L						mg/L	0.001	ND	Arsenic
Boron ND 0.01 mg/L Cadmium ND 0.0001 mg/L Calcium ND 0.1 mg/L						mg/L	0.001	ND	Barium
Cadmium ND 0.0001 mg/L Calcium ND 0.1 mg/L						mg/L	0.0005	ND	Beryllium
Cadmium ND 0.0001 mg/L Calcium ND 0.1 mg/L						mg/L	0.01	ND	Boron
Calcium ND 0.1 mg/L							0.0001		Cadmium
							0.1	ND	Calcium
Chromium ND 0.001 mg/L						mg/L	0.001	ND	Chromium
Cobalt ND 0.0005 mg/L							0.0005		Cobalt
Copper ND 0.0005 mg/L							0.0005		Copper
Iron ND 0.1 mg/L							0.1		

OTTAWA - MISSISSAUGA - HAMILTON - KINGSTON - LONDON - NIAGARA - WINDSOR - RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analyte

Method Quality Control: Blank

Report Date: 07-Nov-2023

Order Date: 1-Nov-2023

Project Description: 100554.003

Notes

Lead	ND	0.0001	mg/L
Magnesium	ND	0.2	mg/L
Manganese	ND	0.005	mg/L
Molybdenum	ND	0.0005	mg/L
Nickel	ND	0.001	mg/L
Potassium	ND	0.1	mg/L
Selenium	ND	0.001	mg/L
Silver	ND	0.0001	mg/L
Sodium	ND	0.2	mg/L
Strontium	ND	0.01	mg/L
Thallium	ND	0.001	mg/L
Uranium	ND	0.0001	mg/L
Vanadium	ND	0.0005	mg/L
Zinc	ND	0.005	mg/L
Microbiological Parameters			
E. coli	ND	1	CFU/100mL
Total Coliforms	ND	1	CFU/100mL
Fecal Coliforms	ND	1	CFU/100mL
Heterotrophic Plate Count	ND	10	CFU/mL

Reporting

Limit

Units

Result

%REC

Limit

%REC

RPD

Limit

RPD



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Duplicate

Report Date: 07-Nov-2023

Order Date: 1-Nov-2023

Project Description: 100554.003

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	16.8	1	mg/L	16.9			0.8	20	
Fluoride	0.39	0.1	mg/L	0.38			2.2	20	
Nitrate as N	ND	0.1	mg/L	ND			NC	20	
Nitrite as N	ND	0.05	mg/L	ND			NC	20	
Sulphate	19.4	1	mg/L	19.3			0.6	20	
General Inorganics									
Alkalinity, total	216	5	mg/L	218			1.0	14	
Ammonia as N	0.033	0.01	mg/L	0.035			5.1	17.7	
Dissolved Organic Carbon	0.9	0.5	mg/L	1.2			30.1	37	
Colour	2	2	TCU	2			0.0	12	
Colour, apparent	28	2	ACU	28			0.0	12	
Conductivity	726	5	uS/cm	737			1.5	5	
рН	8.3	0.1	pH Units	8.3			0.4	3.3	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Total Dissolved Solids	260	10	mg/L	264			1.5	10	
Sulphide	ND	0.02	mg/L	ND			NC	10	
Tannin & Lignin	ND	0.1	mg/L	ND			NC	11	
Total Kjeldahl Nitrogen	0.21	0.1	mg/L	0.23			6.5	16	
Turbidity	3.1	0.1	NTU	3.1			1.6	10	
Metals									
Mercury	ND	0.0001	mg/L	ND			NC	20	
Aluminum	ND	0.001	mg/L	ND			NC	20	
Antimony	ND	0.0005	mg/L	ND			NC	20	
Arsenic	ND	0.001	mg/L	ND			NC	20	
Barium	ND	0.001	mg/L	ND			NC	20	
Beryllium	ND	0.0005	mg/L	ND			NC	20	
Boron	0.07	0.01	mg/L	0.07			2.1	20	
Cadmium	ND	0.0001	mg/L	ND			NC	20	
Calcium	2.6	0.1	mg/L	2.7			3.8	20	
Chromium	ND	0.001	mg/L	ND			NC	20	

OTTAWA - MISSISSAUGA - HAMILTON - KINGSTON - LONDON - NIAGARA - WINDSOR - RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analyte

Cobalt

Copper

Iron

Lead

Nickel

Silver

Sodium

Thallium

Uranium

Vanadium

Microbiological Parameters

Heterotrophic Plate Count

Zinc

E. coli

Total Coliforms

Fecal Coliforms

Magnesium

Manganese

Molybdenum

Potassium

Selenium

Method Quality Control: Duplicate

Report Date: 07-Nov-2023

Order Date: 1-Nov-2023

Project Description: 100554.003

Notes

OTTAWA = MISSISSAUGA	- HAMILTON - KIN	GSTON + LONDON	• NIAGARA ·	WINDSOR	RICHMOND	HILL
----------------------	------------------	----------------	-------------	---------	----------	------

Source

Result

ND

0.0007

ND

ND

0.7

ND

0.0029

ND

1.4

ND

ND

360

ND

ND

ND

ND

ND

ND

ND

30

Units

mg/L

CFU/100mL

CFU/100mL

CFU/100mL

CFU/mL

Reporting

Limit

0.0005

0.0005

0.1

0.0001

0.2

0.005

0.0005

0.001

0.1

0.001

0.0001

0.5

0.001

0.0001

0.0005

0.005

1

1

1

10

Result

ND

0.0006

ND

0.0001

0.6

ND

0.0029

ND

1.4

ND

ND

345

ND

ND

ND

ND

ND

ND

ND

ND

%REC

Limit

%REC

RPD

Limit

20

20

20

20

20

20

20

20

20

20

20

20

20

20

20

20

30

30

30

30

RPD

NC

5.9

NC

NC

5.2

NC

1.3

NC

0.2

NC

NC

4.3

NC

NC

NC

NC

NC

NC

NC

NC



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	26.7	1	mg/L	16.9	97.6	70-124			
Fluoride	1.27	0.1	mg/L	0.38	89.1	70-130			
Nitrate as N	1.06	0.1	mg/L	ND	106	77-126			
Nitrite as N	0.946	0.05	mg/L	ND	94.6	82-115			
Sulphate	28.9	1	mg/L	19.3	96.5	70-130			
General Inorganics									
Ammonia as N	1.06	0.01	mg/L	0.035	103	81-124			
Dissolved Organic Carbon	10.8	0.5	mg/L	1.2	96.9	60-133			
Phenolics	0.027	0.001	mg/L	ND	107	67-133			
Total Dissolved Solids	108	10	mg/L	ND	108	75-125			
Sulphide	0.47	0.02	mg/L	ND	94.6	79-115			
Tannin & Lignin	1.0	0.1	mg/L	ND	99.9	71-113			
Total Kjeldahl Nitrogen	1.15	0.1	mg/L	0.23	92.5	81-126			
Metals									
Mercury	0.0028	0.0001	mg/L	ND	92.1	70-130			
Aluminum	50.4	0.001	mg/L	0.496	99.9	80-120			
Arsenic	53.6	0.001	mg/L	0.105	107	80-120			
Barium	45.9	0.001	mg/L	0.173	91.4	80-120			
Beryllium	44.0	0.0005	mg/L	0.0811	87.9	80-120			
Boron	106	0.01	mg/L	65.1	82.2	80-120			
Cadmium	42.7	0.0001	mg/L	0.0209	85.4	80-120			
Calcium	12200	0.1	mg/L	2680	94.7	80-120			
Chromium	51.6	0.001	mg/L	0.038	103	80-120			
Cobalt	49.1	0.0005	mg/L	0.0411	98.2	80-120			
Copper	45.9	0.0005	mg/L	0.686	90.5	80-120			
Iron	2220	0.1	mg/L	2.0	88.9	80-120			
Lead	43.9	0.0001	mg/L	0.0848	87.5	80-120			
Magnesium	10300	0.2	mg/L	672	96.7	80-120			
Manganese	49.7	0.005	mg/L	0.378	98.5	80-120			
Molybdenum	49.5	0.0005	mg/L	2.94	93.2	80-120			

Report Date: 07-Nov-2023

Order Date: 1-Nov-2023

Project Description: 100554.003

OTTAWA - MISSISSAUGA - HAMILTON - KINGSTON - LONDON - NIAGARA - WINDSOR - RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Nickel	47.5	0.001	mg/L	0.241	94.5	80-120			
Potassium	11300	0.1	mg/L	1400	98.9	80-120			
Selenium	45.9	0.001	mg/L	0.079	91.6	80-120			
Silver	40.1	0.0001	mg/L	0.0032	80.3	80-120			
Sodium	17600	0.2	mg/L	9500	81.2	80-120			
Thallium	45.0	0.001	mg/L	0.025	90.0	80-120			
Uranium	50.1	0.0001	mg/L	0.0613	100	80-120			
Vanadium	53.8	0.0005	mg/L	0.0485	107	80-120			
Zinc	43.4	0.005	mg/L	4.54	77.8	80-120			QM-07

Report Date: 07-Nov-2023

Order Date: 1-Nov-2023

Project Description: 100554.003



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Qualifier Notes:

Sample Qualifiers :

QC Qualifiers:

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL

Report Date: 07-Nov-2023

Order #: 2344227

Order Date: 1-Nov-2023



1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Brent Redmond	
	Report Date: 9-Nov-2023
Client PO: Cedar lakes	Order Date: 2-Nov-2023
Project: 100554.003	0.1
Custody: 13250	Order #: 2344440
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	

Client ID Paracel ID TW2-3hr 2344440-01 2344440-02 TW2-6hr TW2-6hr (Filtered) 2344440-03

Approved By:

Non

Dale Robertson, BSc

Laboratory Director



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar lakes

Analysis Summary Table

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023

Project Description: 100554.003

Analysis	Method Reference/Description	Extraction Date	Analysis Date	
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	6-Nov-23	6-Nov-23	
Ammonia, as N	EPA 351.2 - Auto Colour	6-Nov-23	6-Nov-23	
Anions	EPA 300.1 - IC	6-Nov-23	6-Nov-23	
Colour	SM2120 - Spectrophotometric	3-Nov-23	3-Nov-23	
Colour, apparent	SM2120 - Spectrophotometric	3-Nov-23	3-Nov-23	
Conductivity	EPA 9050A- probe @25 °C	6-Nov-23	6-Nov-23	
Dissolved Organic Carbon	MOE 3247B - Combustion IR	3-Nov-23	6-Nov-23	
E. coli	MOE E3407	3-Nov-23	3-Nov-23	
Fecal Coliform	SM 9222D	3-Nov-23	3-Nov-23	
Heterotrophic Plate Count	SM 9215C	4-Nov-23	4-Nov-23	
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	7-Nov-23	7-Nov-23	
Metals, ICP-MS	EPA 200.8 - ICP-MS	3-Nov-23	6-Nov-23	
рН	EPA 150.1 - pH probe @25 °C	6-Nov-23	6-Nov-23	
Phenolics	EPA 420.2 - Auto Colour, 4AAP	6-Nov-23	6-Nov-23	
Hardness	Hardness as CaCO3	3-Nov-23	6-Nov-23	
Sulphide	SM 4500SE - Colourimetric	3-Nov-23	6-Nov-23	
Tannin/Lignin	SM 5550B - Colourimetric	6-Nov-23	6-Nov-23	
Total Coliform	MOE E3407	3-Nov-23	3-Nov-23	
Total Dissolved Solids	SM 2540C - gravimetric, filtration	4-Nov-23	6-Nov-23	
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	6-Nov-23	7-Nov-23	
Turbidity	SM 2130B - Turbidity meter	4-Nov-23	4-Nov-23	



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar lakes

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023

Project Description: 100554.003

	Client ID:	TW2-3hr	TW2-6hr	TW2-6hr (Filtered)	-		
	Sample Date:	02-Nov-23 11:15	02-Nov-23 14:15	02-Nov-23 14:15	-	-	
	Sample ID:	2344440-01	2344440-02	2344440-03	-		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
	MDL/Units	-	-	-			
Microbiological Parameters	ļļ.		1				
E. coli	1 CFU/100mL	ND	ND	-	-	-	-
Total Coliforms	1 CFU/100mL	1 [1]	ND	-	-	-	-
Fecal Coliforms	1 CFU/100mL	ND	ND	-	-	-	-
Heterotrophic Plate Count	10 CFU/mL	<10	<10	-	-	-	-
General Inorganics							
Alkalinity, total	5 mg/L	353	352	-	-	-	-
Ammonia as N	0.01 mg/L	<0.01	0.02	-	-	-	-
Dissolved Organic Carbon	0.5 mg/L	1.4	1.4	-	-	-	-
Colour, apparent	2 ACU	17	15	-	-	-	-
Colour	2 TCU	<2	<2	-	-	-	-
Conductivity	5 uS/cm	1540	1480	-	-	-	-
Hardness	mg/L	469	465	-	-	-	-
рН	0.1 pH Units	7.9	7.9	-	-	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-	-	-
Total Dissolved Solids	10 mg/L	916	900	-	-	-	-
Sulphide	0.02 mg/L	<0.02	<0.02	-	-	-	-
Tannin & Lignin	0.1 mg/L	<0.1	<0.1	-	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.2	0.2	-	-	-	-
Turbidity	0.1 NTU	2.2	2.0	-	-	-	-
Anions							
Chloride	1 mg/L	246	243	-	-	-	-
Fluoride	0.1 mg/L	<0.1	<0.1	-	-	-	-
Nitrate as N	0.1 mg/L	1.8	1.6	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-	-	-
Sulphate	1 mg/L	123	125	-	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar lakes

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023

Project Description: 100554.003

	Client ID:	TW2-3hr	TW2-6hr	TW2-6hr (Filtered)	-		
	Sample Date:	02-Nov-23 11:15	02-Nov-23 14:15	02-Nov-23 14:15	-	-	
	Sample ID:	2344440-01	2344440-02	234440-03	-		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
	MDL/Units						
Metals	•		•				
Mercury	0.0001 mg/L	-	-	<0.0001	-	-	-
Aluminum	0.001 mg/L	-	0.006	<0.001	-	-	-
Antimony	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Arsenic	0.001 mg/L	-	<0.001	<0.001	-	-	-
Barium	0.001 mg/L	-	0.143	0.138	-	-	-
Beryllium	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Boron	0.01 mg/L	-	0.05	0.04	-	-	-
Cadmium	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Calcium	0.1 mg/L	121	120	119	-	-	-
Chromium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Cobalt	0.0005 mg/L	-	0.0049	0.0049	-	-	-
Copper	0.0005 mg/L	-	0.0006	0.0006	-	-	-
Iron	0.1 mg/L	0.2	0.2	<0.1	-	-	-
Lead	0.0001 mg/L	-	0.0004	0.0003	-	-	-
Magnesium	0.2 mg/L	40.7	40.1	40.4	-	-	-
Manganese	0.005 mg/L	0.032	0.032	0.031	-	-	-
Molybdenum	0.0005 mg/L	-	0.0667	0.0683	-	-	-
Nickel	0.001 mg/L	-	0.021	0.021	-	-	-
Potassium	0.1 mg/L	4.6	4.6	4.5	-	-	-
Selenium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Silver	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Sodium	0.2 mg/L	130	126	128	-	-	-
Strontium	0.01 mg/L	-	0.44	0.43	-	-	-
Thallium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Uranium	0.0001 mg/L	-	0.0042	0.0040	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client ID:

Sample Date:

MDL/Units

0.0005 mg/L

0.005 mg/L

Sample ID:

Matrix:

TW2-3hr

02-Nov-23 11:15

2344440-01

Drinking Water

-

-

Client PO: Cedar lakes

Metals

Zinc

Vanadium

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023

-

-

Project Description: 100554.003

-

-

-

OTTAWA • MISSISSAUGA	 HAMILTON 	 KINGSTON 	 LONDON 	 NIAGARA 	 WINDSOR 	 RICHMOND 	HILL
----------------------	------------------------------	------------------------------	----------------------------	-----------------------------	-----------------------------	------------------------------	------

TW2-6hr (Filtered)

02-Nov-23 14:15

2344440-03

Drinking Water

< 0.0005

<0.005

-

-

_

-

-

TW2-6hr

02-Nov-23 14:15

2344440-02

Drinking Water

< 0.0005

< 0.005



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar lakes

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	1	mg/L					
Fluoride	ND	0.1	mg/L					
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
Sulphate	ND	1	mg/L					
General Inorganics								
Alkalinity, total	ND	5	mg/L					
Ammonia as N	ND	0.01	mg/L					
Dissolved Organic Carbon	ND	0.5	mg/L					
Colour	ND	2	TCU					
Colour, apparent	ND	2	ACU					
Conductivity	ND	5	uS/cm					
Phenolics	ND	0.001	mg/L					
Total Dissolved Solids	ND	10	mg/L					
Sulphide	ND	0.02	mg/L					
Tannin & Lignin	ND	0.1	mg/L					
Total Kjeldahl Nitrogen	ND	0.1	mg/L					
Turbidity	ND	0.1	NTU					
Metals								
Mercury	ND	0.0001	mg/L					
Aluminum	ND	0.001	mg/L					
Antimony	ND	0.0005	mg/L					
Arsenic	ND	0.001	mg/L					
Barium	ND	0.001	mg/L					
Beryllium	ND	0.0005	mg/L					
Boron	ND	0.01	mg/L					
Cadmium	ND	0.0001	mg/L					
Calcium	ND	0.1	mg/L					
Chromium	ND	0.001	mg/L					
Cobalt	ND	0.0005	mg/L					
Copper	ND	0.0005	mg/L					
Iron	ND	0.1	mg/L					
			2					

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar lakes

Analyte

Magnesium

Manganese

Potassium

Selenium

Molybdenum

Lead

Nickel

Silver

Sodium

Strontium

Thallium

Uranium

Zinc

E. coli

Vanadium

Total Coliforms

Fecal Coliforms

Microbiological Parameters

Heterotrophic Plate Count

Method Quality Control: Blank

Order #: 2344440

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023

Project Description: 100554.003

Notes

OTTAWA • MISS	SISSAUGA + HAMILTON	KINGSTON	 LONDON 	 NIAGARA 	 WINDSOR 	 RICHMOND 	HILL
---------------	---------------------	----------	----------------------------	-----------------------------	-----------------------------	------------------------------	------

Reporting

Limit

0.0001

0.2

0.005

0.0005

0.001

0.1

0.001

0.0001

0.2

0.01

0.001

0.0001

0.0005

0.005

1

1

1

10

Units

mg/L

CFU/100mL

CFU/100mL

CFU/100mL

CFU/mL

Result

ND

%REC

Limit

%REC

RPD

Limit

RPD



Client: GEMTEC Consulting Engineers and Scientists Limited

Reporting

Limit

1

0.1

0.1

0.05

1

5

0.01

0.5

2

Result

79.4

ND

ND

ND

155

349

0.018

1.2

ND

Client PO: Cedar lakes

Analyte

Anions Chloride

Fluoride

Nitrate as N

Nitrite as N

General Inorganics Alkalinity, total

Dissolved Organic Carbon

Ammonia as N

Sulphate

Colour

Method Quality Control: Duplicate

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023

Project Description: 100554.003

Notes

Colour, apparent	17	2	ACU	17	0.0	12	
Conductivity	1550	5	uS/cm	1540	1.0	5	QR-05
рН	7.9	0.1	pH Units	7.9	0.0	3.3	
Phenolics	ND	0.001	mg/L	ND	NC	10	
Total Dissolved Solids	260	10	mg/L	264	1.5	10	
Sulphide	ND	0.02	mg/L	ND	NC	10	
Tannin & Lignin	ND	0.1	mg/L	ND	NC	11	
Total Kjeldahl Nitrogen	0.22	0.1	mg/L	0.24	10.2	16	
Turbidity	1.9	0.1	NTU	2.0	1.0	10	
Metals							
Mercury	ND	0.0001	mg/L	ND	NC	20	
Aluminum	0.002	0.001	mg/L	0.002	3.1	20	
Antimony	ND	0.0005	mg/L	ND	NC	20	
Arsenic	ND	0.001	mg/L	ND	NC	20	
Barium	0.079	0.001	mg/L	0.082	3.2	20	
Beryllium	ND	0.0005	mg/L	ND	NC	20	
Boron	ND	0.01	mg/L	ND	NC	20	
Cadmium	ND	0.0001	mg/L	ND	NC	20	
Calcium	101	0.1	mg/L	101	0.7	20	
Chromium	ND	0.001	mg/L	ND	NC	20	

Source

Result

79.0

ND

ND

ND

155

353

0.020

1.3

ND

Units

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

TCU

%REC

Limit

%REC

RPD

Limit

20

20

20

20

20

14

17.7

37

12

RPD

0.5

NC

NC

NC

0.0

1.2

7.8

13.2

NC



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar lakes

Analyte

Cobalt

Copper

Iron

Lead

Nickel

Silver

Sodium

Thallium

Uranium

Zinc

E. coli

Total Coliforms

Fecal Coliforms

Vanadium

Microbiological Parameters

Heterotrophic Plate Count

Magnesium

Manganese

Molybdenum

Potassium

Selenium

Method Quality Control: Duplicate

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023

Project Description: 100554.003

Notes

OTTAWA • N	AISSISSAUGA	HAMILTON •	KINGSTON	 LONDON 	NIAGARA	 WINDSOR 	 RICHMOND 	HILL
------------	-------------	------------	----------	----------------------------	---------	-----------------------------	------------------------------	------

Source

Result

ND

0.0086

ND

0.0003

27.8

0.481

0.0006

0.002

2.7

ND

ND

5.6

ND

0.0014

0.0017

0.006

ND

1

ND

ND

Units

mg/L

CFU/100mL

CFU/100mL

CFU/100mL

CFU/mL

Reporting

Limit

0.0005

0.0005

0.1

0.0001

0.2

0.005

0.0005

0.001

0.1

0.001

0.0001

0.2

0.001

0.0001

0.0005

0.005

1

1

1

10

Result

ND

0.0085

ND

0.0003

27.9

0.482

0.0005

0.002

2.7

ND

ND

5.3

ND

0.0014

0.0017

0.006

ND

ND

ND

ND

%REC

Limit

%REC

RPD

Limit

20

20

20

20

20

20

20

20

20

20

20

20

20

20

20

20

30

30

30

30

RPD

NC

1.4

NC

9.9

0.0

0.1

16.8

3.3

0.3

NC

NC

7.2

NC

3.8

2.4

3.8

NC

NC

NC

NC



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar lakes

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	88.9	1	mg/L	79.0	99.0	70-124			
Fluoride	1.02	0.1	mg/L	ND	102	70-130			
Nitrate as N	1.02	0.1	mg/L	ND	102	77-126			
Nitrite as N	0.904	0.05	mg/L	ND	90.4	82-115			
Sulphate	164	1	mg/L	155	91.9	70-130			
General Inorganics Ammonia as N	1.08	0.01	mg/L	0.020	106	81-124			
Dissolved Organic Carbon	11.0	0.5	mg/L	1.4	95.9	60-133			
Phenolics	0.026	0.001	mg/L	ND	102	67-133			
Total Dissolved Solids	108	10	mg/L	ND	108	75-125			
Sulphide	0.47	0.02	mg/L	ND	94.6	79-115			
Tannin & Lignin	1.0	0.1	mg/L	ND	99.9	71-113			
Total Kjeldahl Nitrogen	1.14	0.1	mg/L	0.24	90.3	81-126			
Metals			U						
Mercury	0.0028	0.0001	mg/L	ND	92.1	70-130			
Aluminum	44.4	0.001	mg/L	2.05	84.6	80-120			
Arsenic	53.9	0.001	mg/L	0.261	107	80-120			
Barium	52.2	0.001	mg/L	ND	104	80-120			
Beryllium	44.4	0.0005	mg/L	0.0153	88.8	80-120			
Boron	51.4	0.01	mg/L	8.67	85.5	80-120			
Cadmium	45.2	0.0001	mg/L	0.0470	90.3	80-120			
Calcium	10700	0.1	mg/L	ND	107	80-120			
Chromium	52.4	0.001	mg/L	0.459	104	80-120			
Cobalt	47.6	0.0005	mg/L	0.0907	95.1	80-120			
Copper	52.9	0.0005	mg/L	8.61	88.5	80-120			
Iron	2230	0.1	mg/L	2.8	89.0	80-120			
Lead	42.2	0.0001	mg/L	0.312	83.7	80-120			
Magnesium	10800	0.2	mg/L	ND	108	80-120			
Manganese	96.7	0.005	mg/L	49.6	94.1	80-120			
Molybdenum	46.8	0.0005	mg/L	0.649	92.3	80-120			

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023

Project Description: 100554.003



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar lakes

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Nickel	47.9	0.001	mg/L	1.61	92.7	80-120			
Potassium	12600	0.1	mg/L	2730	98.4	80-120			
Selenium	49.8	0.001	mg/L	0.158	99.2	80-120			
Silver	51.5	0.0001	mg/L	ND	103	80-120			
Sodium	14300	0.2	mg/L	5640	86.2	80-120			
Thallium	43.5	0.001	mg/L	0.027	87.0	80-120			
Uranium	45.7	0.0001	mg/L	1.41	88.5	80-120			
Vanadium	54.9	0.0005	mg/L	1.72	106	80-120			
Zinc	48.3	0.005	mg/L	6.10	84.3	80-120			

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar lakes

Qualifier Notes:

Login Qualifiers :

Report Date: 09-Nov-2023

Order Date: 2-Nov-2023

Project Description: 100554.003

Container(s) - Labeled improperly/insufficient information - All sample bottles missing the sample collection time. Applies to Samples: TW2-3hr, TW2-6hr, TW2-6hr (Filtered)

Sample Qualifiers :

1: Duplicate result for this sample analysis was determined to be ND.

QC Qualifiers:

QR-05 Duplicate RPDs higher than normally accepted. Remaining batch QA\QC was acceptable. May be sample effect.

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited 32 Steacie Drive Kanata, ON K2K 2A9	
Attn: Brent Redmond	Report Date: 6-Nov-2023
Client PO:	Order Date: 31-Oct-2023
Project: 100554.003	Order #: 2344186
Custody: 17439	Order #. 2344100
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	
Paracel ID Client ID	
2344186-01 TW3-3hr	
2344186-02 TW3-6hr	
2344186-03 TW3-6hr (Filtered)	

Approved By:

Nosa

Dale Robertson, BSc

Laboratory Director



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis Summary Table

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023

Project Description: 100554.003

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	1-Nov-23	1-Nov-23
Ammonia, as N	EPA 351.2 - Auto Colour	2-Nov-23	2-Nov-23
Anions	EPA 300.1 - IC	1-Nov-23	1-Nov-23
Colour	SM2120 - Spectrophotometric	1-Nov-23	1-Nov-23
Colour, apparent	SM2120 - Spectrophotometric	1-Nov-23	1-Nov-23
Conductivity	EPA 9050A- probe @25 °C	1-Nov-23	1-Nov-23
Dissolved Organic Carbon	MOE 3247B - Combustion IR	1-Nov-23	2-Nov-23
E. coli	MOE E3407	1-Nov-23	1-Nov-23
Fecal Coliform	SM 9222D	1-Nov-23	1-Nov-23
Heterotrophic Plate Count	SM 9215C	1-Nov-23	1-Nov-23
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	2-Nov-23	2-Nov-23
Metals, ICP-MS	EPA 200.8 - ICP-MS	1-Nov-23	2-Nov-23
рН	EPA 150.1 - pH probe @25 °C	1-Nov-23	1-Nov-23
Phenolics	EPA 420.2 - Auto Colour, 4AAP	2-Nov-23	2-Nov-23
Hardness	Hardness as CaCO3	1-Nov-23	2-Nov-23
Sulphide	SM 4500SE - Colourimetric	3-Nov-23	6-Nov-23
Tannin/Lignin	SM 5550B - Colourimetric	6-Nov-23	6-Nov-23
Total Coliform	MOE E3407	1-Nov-23	1-Nov-23
Total Dissolved Solids	SM 2540C - gravimetric, filtration	2-Nov-23	3-Nov-23
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	1-Nov-23	1-Nov-23
Turbidity	SM 2130B - Turbidity meter	1-Nov-23	1-Nov-23



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023

Project Description: 100554.003

	Client ID:	TW3-3hr	TW3-6hr	TW3-6hr (Filtered)			1
	Sample Date:	30-Oct-23 13:00	30-Oct-23 16:00	30-Oct-23 16:00			
	Sample Date:		2344186-02	2344186-03		-	-
	Matrix:	2344186-01 Drinking Water	Drinking Water	Drinking Water	-		
	MDL/Units		g	g			
Microbiological Parameters				<u> </u>	ļ I		
E. coli	1 CFU/100mL	ND	ND	-	-	-	-
Total Coliforms	1 CFU/100mL	14	8	-	-	-	-
Fecal Coliforms	1 CFU/100mL	ND	ND	-	-	-	-
Heterotrophic Plate Count	10 CFU/mL	10	20	-	-	-	-
General Inorganics							
Alkalinity, total	5 mg/L	249	249	-	-	-	-
Ammonia as N	0.01 mg/L	0.13	0.11	-	-	-	-
Dissolved Organic Carbon	0.5 mg/L	1.2	1.2	-	-	-	-
Colour, apparent	2 ACU	9	9	-	-	-	-
Colour	2 TCU	2	2	-	-	-	-
Conductivity	5 uS/cm	724	752	-	-	-	-
Hardness	mg/L	345	342	-	-	-	-
pH	0.1 pH Units	8.0	8.0	-	-	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-	-	-
Total Dissolved Solids	10 mg/L	422	426	-	-	-	-
Sulphide	0.02 mg/L	<0.02	<0.02	-	-	-	-
Tannin & Lignin	0.1 mg/L	<0.1	<0.1	-	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.1	0.2	-	-	-	-
Turbidity	0.1 NTU	1.0	0.8	-	-	-	-
Anions							
Chloride	1 mg/L	61	61	-	-	-	-
Fluoride	0.1 mg/L	<0.1	<0.1	-	-	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-	-	-
Sulphate	1 mg/L	68	68	-	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023

Project Description: 100554.003

	Client ID:	TW3-3hr	TW3-6hr	TW3-6hr (Filtered)	-		
	Sample Date:	30-Oct-23 13:00	30-Oct-23 16:00	30-Oct-23 16:00	-	-	-
	Sample ID:	Sample ID: 2344186-01 2		2344186-03	-		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
	MDL/Units						
Metals	•		•				•
Mercury	0.0001 mg/L	-	-	<0.0001	-	-	-
Aluminum	0.001 mg/L	-	0.003	<0.001	-	-	-
Antimony	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Arsenic	0.001 mg/L	-	<0.001	<0.001	-	-	-
Barium	0.001 mg/L	-	0.157	0.155	-	-	-
Beryllium	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Boron	0.01 mg/L	-	0.02	0.02	-	-	-
Cadmium	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Calcium	0.1 mg/L	71.3	70.9	70.2	-	-	-
Chromium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Cobalt	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Copper	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Iron	0.1 mg/L	0.2	0.2	0.2	-	-	-
Lead	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Magnesium	0.2 mg/L	40.6	40.1	38.6	-	-	-
Manganese	0.005 mg/L	0.026	0.027	0.026	-	-	-
Molybdenum	0.0005 mg/L	-	0.0041	0.0040	-	-	-
Nickel	0.001 mg/L	-	<0.001	<0.001	-	-	-
Potassium	0.1 mg/L	2.5	2.5	2.5	-	-	-
Selenium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Silver	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Sodium	0.2 mg/L	14.2	14.2	13.7	-	-	-
Strontium	0.01 mg/L	-	0.53	0.52	-	-	-
Thallium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Uranium	0.0001 mg/L	-	0.0002	0.0002	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Metals

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023

Project Description: 100554.003

Clier	TW3-3hr	TW3-6hr	TW3-6hr (Filtered)	-		
Sample	ate: 30-Oct-23 13:00	30-Oct-23 16:00	30-Oct-23 16:00	-	-	-
Samp	e ID: 2344186-01	2344186-02	2344186-03	-		
Μ	trix: Drinking Water	Drinking Water	Drinking Water	-		
MDL/Uni	5					
				·		

Vanadium	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Zinc	0.005 mg/L	-	<0.005	<0.005	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	1	mg/L					
Fluoride	ND	0.1	mg/L					
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
Sulphate	ND	1	mg/L					
General Inorganics								
Alkalinity, total	ND	5	mg/L					
Ammonia as N	ND	0.01	mg/L					
Dissolved Organic Carbon	ND	0.5	mg/L					
Colour	ND	2	TCU					
Colour, apparent	ND	2	ACU					
Conductivity	ND	5	uS/cm					
Phenolics	ND	0.001	mg/L					
Total Dissolved Solids	ND	10	mg/L					
Sulphide	ND	0.02	mg/L					
Tannin & Lignin	ND	0.1	mg/L					
Total Kjeldahl Nitrogen	ND	0.1	mg/L					
Turbidity	ND	0.1	NTU					
Metals								
Mercury	ND	0.0001	mg/L					
Aluminum	ND	0.001	mg/L					
Antimony	ND	0.0005	mg/L					
Arsenic	ND	0.001	mg/L					
Barium	ND	0.001	mg/L					
Beryllium	ND	0.0005	mg/L					
Boron	ND	0.01	mg/L					
Cadmium	ND	0.0001	mg/L					
Calcium	ND	0.1	mg/L					
Chromium	ND	0.001	mg/L					
Cobalt	ND	0.0005	mg/L					
Copper	ND	0.0005	mg/L					
Iron	ND	0.1	mg/L					

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023

Project Description: 100554.003



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Fecal Coliforms

Heterotrophic Plate Count

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Lead	ND	0.0001	mg/L					
Magnesium	ND	0.2	mg/L					
Manganese	ND	0.005	mg/L					
Molybdenum	ND	0.0005	mg/L					
Nickel	ND	0.001	mg/L					
Potassium	ND	0.1	mg/L					
Selenium	ND	0.001	mg/L					
Silver	ND	0.0001	mg/L					
Sodium	ND	0.2	mg/L					
Strontium	ND	0.01	mg/L					
Thallium	ND	0.001	mg/L					
Uranium	ND	0.0001	mg/L					
Vanadium	ND	0.0005	mg/L					
Zinc	ND	0.005	mg/L					
Microbiological Parameters								
E. coli	ND	1	CFU/100mL					
Total Coliforms	ND	1	CFU/100mL					

CFU/100mL

CFU/mL

1 10

ND

ND

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Duplicate

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023

Project Description: 100554.003

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	16.8	1	mg/L	16.9			0.8	20	
Fluoride	0.39	0.1	mg/L	0.38			2.2	20	
Nitrate as N	ND	0.1	mg/L	ND			NC	20	
Nitrite as N	ND	0.05	mg/L	ND			NC	20	
Sulphate	19.4	1	mg/L	19.3			0.6	20	
General Inorganics		_		0.40			4.0		
Alkalinity, total	247	5	mg/L	249			1.0	14	
Ammonia as N	0.033	0.01	mg/L	0.035			5.1	17.7	
Dissolved Organic Carbon	0.9	0.5	mg/L	1.2			30.1	37	
Colour	2	2	TCU	2			0.0	12	
Colour, apparent	9	2	ACU	9			0.0	12	
Conductivity	721	5	uS/cm	724			0.3	5	
рН	8.0	0.1	pH Units	8.0			0.3	3.3	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Total Dissolved Solids	844	10	mg/L	844			0.0	10	
Sulphide	ND	0.02	mg/L	ND			NC	10	
Tannin & Lignin	ND	0.1	mg/L	ND			NC	11	
Total Kjeldahl Nitrogen	0.11	0.1	mg/L	0.12			8.8	16	
Turbidity	0.1	0.1	NTU	0.1			0.0	10	
Metals									
Mercury	ND	0.0001	mg/L	ND			NC	20	
Aluminum	ND	0.001	mg/L	ND			NC	20	
Antimony	ND	0.0005	mg/L	ND			NC	20	
Arsenic	ND	0.001	mg/L	ND			NC	20	
Barium	ND	0.001	mg/L	ND			NC	20	
Beryllium	ND	0.0005	mg/L	ND			NC	20	
Boron	0.07	0.01	mg/L	0.07			2.1	20	
Cadmium	ND	0.0001	mg/L	ND			NC	20	
Calcium	2.6	0.1	mg/L	2.7			3.8	20	
Chromium	ND	0.001	mg/L	ND			NC	20	



Client: GEMTEC Consulting Engineers and Scientists Limited

Reporting

Limit

0.0005

0.0005

0.1

0.0001

0.2

0.005

0.0005

0.001

0.1

0.001

0.0001

0.5

0.001

0.0001

0.0005

0.005

1

1

1

10

Result

ND

0.0006

ND

0.0001

0.6

ND

0.0029

ND

1.4

ND

ND

345

ND

ND

ND

ND

ND

11

ND

10

Client PO:

Analyte

Cobalt

Copper

Iron

Lead

Nickel

Silver

Sodium

Thallium

Uranium

Vanadium

Microbiological Parameters

Heterotrophic Plate Count

Zinc

E. coli

Total Coliforms

Fecal Coliforms

Magnesium

Manganese

Molybdenum

Potassium

Selenium

Method Quality Control: Duplicate

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023

Project Description: 100554.003

Notes

OTTAWA = MISSISSAUGA	- HAMILTON - KINGSTON	LONDON - NIAGARA	WINDSOR - RICHMOND HILL	
----------------------	-----------------------	------------------	-------------------------	--

%REC

Limit

%REC

Source

Result

ND

0.0007

ND

ND

0.7

ND

0.0029

ND

1.4

ND

ND

360

ND

ND

ND

ND

ND

14

ND

10

Units

mg/L

CFU/100mL

CFU/100mL

CFU/100mL

CFU/mL

RPD

Limit

20

20

20

20

20

20

20

20

20

20

20

20

20

20

20

20

30

30

30

30

RPD

NC

5.9

NC

NC

5.2

NC

1.3

NC

0.2

NC

NC

4.3

NC

NC

NC

NC

NC

24.0

NC

0.0



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	26.7	1	mg/L	16.9	97.6	70-124			
Fluoride	1.27	0.1	mg/L	0.38	89.1	70-130			
Nitrate as N	1.06	0.1	mg/L	ND	106	77-126			
Nitrite as N	0.946	0.05	mg/L	ND	94.6	82-115			
Sulphate	28.9	1	mg/L	19.3	96.5	70-130			
General Inorganics									
Ammonia as N	1.06	0.01	mg/L	0.035	103	81-124			
Dissolved Organic Carbon	10.8	0.5	mg/L	1.2	96.9	60-133			
Phenolics	0.027	0.001	mg/L	ND	107	67-133			
Total Dissolved Solids	90.0	10	mg/L	ND	90.0	75-125			
Sulphide	0.47	0.02	mg/L	ND	94.6	79-115			
Tannin & Lignin	1.0	0.1	mg/L	ND	99.9	71-113			
Total Kjeldahl Nitrogen	1.10	0.1	mg/L	0.12	97.3	81-126			
Metals									
Mercury	0.0027	0.0001	mg/L	ND	89.3	70-130			
Aluminum	50.4	0.001	mg/L	0.496	99.9	80-120			
Arsenic	53.6	0.001	mg/L	0.105	107	80-120			
Barium	45.9	0.001	mg/L	0.173	91.4	80-120			
Beryllium	44.0	0.0005	mg/L	0.0811	87.9	80-120			
Boron	106	0.01	mg/L	65.1	82.2	80-120			
Cadmium	42.7	0.0001	mg/L	0.0209	85.4	80-120			
Calcium	12200	0.1	mg/L	2680	94.7	80-120			
Chromium	51.6	0.001	mg/L	0.038	103	80-120			
Cobalt	49.1	0.0005	mg/L	0.0411	98.2	80-120			
Copper	45.9	0.0005	mg/L	0.686	90.5	80-120			
Iron	2220	0.1	mg/L	2.0	88.9	80-120			
Lead	43.9	0.0001	mg/L	0.0848	87.5	80-120			
Magnesium	10300	0.2	mg/L	672	96.7	80-120			
Manganese	49.7	0.005	mg/L	0.378	98.5	80-120			
Molybdenum	49.5	0.0005	mg/L	2.94	93.2	80-120			

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023

Project Description: 100554.003



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Nickel	47.5	0.001	mg/L	0.241	94.5	80-120			
Potassium	11300	0.1	mg/L	1400	98.9	80-120			
Selenium	45.9	0.001	mg/L	0.079	91.6	80-120			
Silver	40.1	0.0001	mg/L	0.0032	80.3	80-120			
Sodium	17600	0.2	mg/L	9500	81.2	80-120			
Thallium	45.0	0.001	mg/L	0.025	90.0	80-120			
Uranium	50.1	0.0001	mg/L	0.0613	100	80-120			
Vanadium	53.8	0.0005	mg/L	0.0485	107	80-120			
Zinc	43.4	0.005	mg/L	4.54	77.8	80-120			QM-07

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Qualifier Notes:

Sample Qualifiers :

QC Qualifiers:

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 06-Nov-2023

Order Date: 31-Oct-2023



1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Con	sulting Engineers and Scientists Limited		
32 Steacie Driv	e		
Kanata, ON K2	K 2A9		
Attn: Ester Wils	on		
			Report Date: 2-Nov-2023
Client PO:			Order Date: 26-Oct-2023
Project: 100554.0	003		Order #: 2343287
Custody: 1904	47	Revised Report	
This Certificate of	of Analysis contains analytical data applicable to the following	samples as submitted:	
Paracel ID	Client ID		
2343287-01	TW4-3hr		

Approved By:

2343287-02

2343287-03

TW4-6hr

TW4-6hr (Filtered)

Mark Foto

Mark Foto, M.Sc.



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis Summary Table

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023

Project Description: 100554.003

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	27-Oct-23	27-Oct-23
Ammonia, as N	EPA 351.2 - Auto Colour	30-Oct-23	30-Oct-23
Anions	EPA 300.1 - IC	26-Oct-23	26-Oct-23
Colour	SM2120 - Spectrophotometric	26-Oct-23	26-Oct-23
Colour, apparent	SM2120 - Spectrophotometric	26-Oct-23	26-Oct-23
Conductivity	EPA 9050A- probe @25 °C	27-Oct-23	27-Oct-23
Dissolved Organic Carbon	MOE 3247B - Combustion IR	30-Oct-23	1-Nov-23
E. coli	MOE E3407	26-Oct-23	26-Oct-23
Fecal Coliform	SM 9222D	26-Oct-23	26-Oct-23
Heterotrophic Plate Count	SM 9215C	26-Oct-23	26-Oct-23
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	30-Oct-23	31-Oct-23
Metals, ICP-MS	EPA 200.8 - ICP-MS	26-Oct-23	26-Oct-23
рН	EPA 150.1 - pH probe @25 °C	27-Oct-23	27-Oct-23
Phenolics	EPA 420.2 - Auto Colour, 4AAP	26-Oct-23	26-Oct-23
Hardness	Hardness as CaCO3	26-Oct-23	26-Oct-23
Sulphide	SM 4500SE - Colourimetric	30-Oct-23	31-Oct-23
Tannin/Lignin	SM 5550B - Colourimetric	30-Oct-23	31-Oct-23
Total Coliform	MOE E3407	26-Oct-23	26-Oct-23
Total Dissolved Solids	SM 2540C - gravimetric, filtration	30-Oct-23	30-Oct-23
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	30-Oct-23	31-Oct-23
Turbidity	SM 2130B - Turbidity meter	26-Oct-23	26-Oct-23



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023

Project Description: 100554.003

	Client ID:	TW4-3hr	TW4-6hr	TW4-6hr (Filtered)	-		
	Sample Date:	25-Oct-23 11:00	25-Oct-23 14:00	25-Oct-23 14:00	-	_	
	Sample ID:	2343287-01	2343287-02	2343287-03	-		-
	Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
	MDL/Units	-					
Microbiological Parameters	I			ļ	ļ I		Į
E. coli	1 CFU/100mL	ND [1]	ND [1]	-	-	-	-
Total Coliforms	1 CFU/100mL	ND [1]	ND [1]	-	-	-	-
Fecal Coliforms	1 CFU/100mL	ND	ND	-	-	-	-
Heterotrophic Plate Count	10 CFU/mL	60	30	-	-	-	-
General Inorganics							
Alkalinity, total	5 mg/L	267	268	-	-	-	-
Ammonia as N	0.01 mg/L	0.20	0.19	-	-	-	-
Dissolved Organic Carbon	0.5 mg/L	1.5	1.6	-	-	-	-
Colour, apparent	2 ACU	37	28	-	-	-	-
Colour	2 TCU	<2	<2	-	-	-	-
Conductivity	5 uS/cm	1030	1020	-	-	-	-
Hardness	mg/L	373	388	-	-	-	-
рН	0.1 pH Units	8.0	8.0	-	-	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-	-	-
Total Dissolved Solids	10 mg/L	562	588	-	-	-	-
Sulphide	0.02 mg/L	<0.02	<0.02	-	-	-	-
Tannin & Lignin	0.1 mg/L	<0.1	<0.1	-	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.3	0.3	-	-	-	-
Turbidity	0.1 NTU	5.0	3.7	-	-	-	-
Anions							
Chloride	1 mg/L	140	143	-	-	-	-
Fluoride	0.1 mg/L	0.1	0.1	-	-	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-	-	-
Sulphate	1 mg/L	82	83	-	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023

Project Description: 100554.003

	Client ID:	TW4-3hr	TW4-6hr	TW4-6hr (Filtered)	-		
	Sample Date:	25-Oct-23 11:00	25-Oct-23 14:00	25-Oct-23 14:00	-	-	-
	Sample ID:	2343287-01	2343287-02	2343287-03	-		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
	MDL/Units						
Metals			•				
Mercury	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Aluminum	0.001 mg/L	-	0.062	0.003	-	-	-
Antimony	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Arsenic	0.001 mg/L	-	<0.001	<0.001	-	-	-
Barium	0.001 mg/L	-	0.212	0.206	-	-	-
Beryllium	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Boron	0.01 mg/L	-	0.07	0.07	-	-	-
Cadmium	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Calcium	0.1 mg/L	82.5	84.9	95.2	-	-	-
Chromium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Cobalt	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Copper	0.0005 mg/L	-	<0.0005	0.0005	-	-	-
Iron	0.1 mg/L	0.3	0.4	0.3	-	-	-
Lead	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Magnesium	0.2 mg/L	40.6	42.7	46.0	-	-	-
Manganese	0.005 mg/L	0.029	0.029	0.031	-	-	-
Molybdenum	0.0005 mg/L	-	0.0062	0.0072	-	-	-
Nickel	0.001 mg/L	-	<0.001	<0.001	-	-	-
Potassium	0.1 mg/L	6.3	6.3	7.5	-	-	-
Selenium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Silver	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Sodium	0.2 mg/L	61.4	61.9	68.4	-	-	-
Strontium	0.01 mg/L	-	1.04	1.11	-	-	-
Thallium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Uranium	0.0001 mg/L	-	0.0002	0.0002	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Metals

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023

Client ID:	TW4-3hr	TW4-6hr	TW4-6hr (Filtered)	-		
Sample Date:	25-Oct-23 11:00	25-Oct-23 14:00	25-Oct-23 14:00	-	-	-
Sample ID:	2343287-01	2343287-02	2343287-03	-		
Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
MDL/Units						

Vanadium	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Zinc	0.005 mg/L	-	<0.005	<0.005	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Blank

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023

Project Description: 100554.003

ChlorideND1mg/LFluorideND0.1mg/LNitrite as NND0.05mg/LSulphateND0.5mg/LSonara InorganicsnunuAmmonia as NND0.0mg/LColourND0.0mg/LColour (Saparent)ND0.0mg/LColour (Saparent)ND0.0mg/LColour (Saparent)ND0.0mg/LColour (Saparent)ND0.0mg/LColour (Saparent)ND0.0mg/LColour (Saparent)ND0.0mg/LTotal Disolved SolidsND0.0mg/LTotal Disolved SolidsND0.0mg/LTotal Disolved SolidsND0.0mg/LTotal MittingenND0.01mg/LMercuryND0.001mg/LAluminumND0.001mg/LAluminumND0.001mg/LAluminumND0.001mg/LArtimonyND0.001mg/LArtimonyND0.001mg/LArtimonyND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg	Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
ChlorideND1mg/LFluorideND0.1mg/LNitrite as NND0.05mg/LSulphateND0.5mg/LSonara InorganicsnunuAmmonia as NND0.0mg/LColourND0.0mg/LColour (Saparent)ND0.0mg/LColour (Saparent)ND0.0mg/LColour (Saparent)ND0.0mg/LColour (Saparent)ND0.0mg/LColour (Saparent)ND0.0mg/LColour (Saparent)ND0.0mg/LTotal Disolved SolidsND0.0mg/LTotal Disolved SolidsND0.0mg/LTotal Disolved SolidsND0.0mg/LTotal MittingenND0.01mg/LMercuryND0.001mg/LAluminumND0.001mg/LAluminumND0.001mg/LAluminumND0.001mg/LArtimonyND0.001mg/LArtimonyND0.001mg/LArtimonyND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg/LCardinumND0.001mg	Anions								
Nirate as N ND 0.1 mg/L Nirate as N ND 0.05 mg/L Seneral horganics mg/L Atlanily, Usda ND 5 mg/L Anmonia as N ND 0.01 mg/L Colour ND 0.01 mg/L Colour as N ND 0.5 mg/L Colour apparent ND 2 ACU Conductivity ND 0.001 mg/L Total Dissolved Solids ND 0.001 mg/L Sulphide ND 0.001 mg/L Total Solidvid Solids ND 0.1 mg/L Total Solidvid Solids ND 0.1 mg/L Total Solidvid Solids ND 0.1 mg/L Total Solidvid Solids ND 0.01 mg/L Total Solidvid Solids ND 0.001 mg/L Auminum ND 0.001 mg/L Auminum ND 0.001 mg/L <td>Chloride</td> <td>ND</td> <td>1</td> <td>mg/L</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Chloride	ND	1	mg/L					
Nirtle as N ND 0.05 mg/L Sulphate ND 1 mg/L Sulphate ND 5 mg/L Alkaliniy, total ND 0.01 mg/L Disolved Organic Carbon ND 0.5 mg/L Colour ND 2 TCU Colour Organic Carbon ND 2 ACU Conductivity ND 0.01 mg/L Colour organic Carbon ND 0.001 mg/L Colour organic Carbon ND 0.02 mg/L Colour organic Carbon ND 0.001 mg/L Colour organic Carbon ND 0.01 mg/L Sulphate ND 0.001 mg/L Sulphate ND 0.001 mg/L Sulphate ND	Fluoride	ND	0.1	mg/L					
SulphateND1mg/LGeneral InorganicsKalkalinki, totalND5mg/LArmonia as NND0.01mg/LDissolved Organic CarbonND0.2TCUColourND2.0TCUColour, apparentND2.0TCUConductivityND0.001mg/LTotal Dissolved SolidsND0.001mg/LTotal Dissolved SolidsND0.01mg/LTotal SulphideND0.01mg/LTotal KighinND0.01mg/LTotal KighinND0.01mg/LTotal KighinND0.01mg/LTotal SulphideND0.01mg/LTotal KighinND0.001mg/LTotal KighinND0.001mg/LAuminumND0.001mg/LAuminumND0.001mg/LBariumND0.001mg/LBariumND0.001mg/LBariumND0.001mg/LBoronND0.001mg/LCadmiunND0.001mg/LCadmiunND0.001mg/LCadmiunND0.001mg/LCadmiunND0.001mg/LCadmiunND0.001mg/LCadmiunND0.001mg/LCadmiunND0.001mg/LCadmiunND0.001mg/LCadmiunN	Nitrate as N	ND	0.1	mg/L					
General Inorganics ND S mg/L Alkaliniy, total ND 0.01 mg/L Dissolved Organic Carbon ND 0.5 mg/L Colour, apparent ND 2 ACU Conductivity ND 5 us/cm Phenolics ND 0.001 mg/L Total Dissolved Solids ND 0.00 mg/L Total Dissolved Solids ND 0.00 mg/L Total Dissolved Solids ND 0.00 mg/L Total Dissolved Solids ND 0.01 mg/L Total Kjeldahi Nitrogen ND 0.1 mg/L Turbidiy ND 0.001 mg/L Autimum ND 0.001 mg/L Autimum ND 0.001 mg/L Barium ND 0.001 mg/L Autimum ND 0.001 mg/L Barium ND 0.001 mg/L Barium ND 0.001	Nitrite as N	ND	0.05	mg/L					
Alkalini, total ND 5 mg/L Ammonia as N ND 0.01 mg/L Disolved Organic Carbon ND 2.0 TG/L Colour ND 2.0 ACU Colour, apparent ND 2.0 ACU Conductivity ND 0.001 mg/L Disolved Organic Carbon ND 0.001 mg/L Stabioled Solids ND 0.02 mg/L Total Disolved Solids ND 0.02 mg/L Total Signin ND 0.02 mg/L Total Klegnin ND 0.1 mg/L Total Kleghaln Nitrogen ND 0.1 mg/L Mumium ND 0.001 mg/L Aluminum ND 0.001 mg/L Artimony ND 0.001 mg/L Artimony ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.001 mg/L <	Sulphate	ND	1	mg/L					
Alkalini, total ND 5 mg/L Ammonia as N ND 0.01 mg/L Disolved Organic Carbon ND 2.0 TG/L Colour ND 2.0 ACU Colour, apparent ND 2.0 ACU Conductivity ND 0.001 mg/L Disolved Organic Carbon ND 0.001 mg/L Stabioled Solids ND 0.02 mg/L Total Disolved Solids ND 0.02 mg/L Total Signin ND 0.02 mg/L Total Klegnin ND 0.1 mg/L Total Kleghaln Nitrogen ND 0.1 mg/L Mumium ND 0.001 mg/L Aluminum ND 0.001 mg/L Artimony ND 0.001 mg/L Artimony ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.001 mg/L <	General Inorganics								
Dissolved Organic Carbon ND 0.5 mg/L Colour ND 2 TCU Colour, papernt ND 5 uS/cm Conductivity ND 5 uS/cm Phenolics ND 0.001 mg/L Stabioved Solids ND 0.02 mg/L Sulphide ND 0.02 mg/L Total Dissolved Solids ND 0.02 mg/L Sulphide ND 0.02 mg/L Total Visolved Solids ND 0.01 mg/L Sulphide ND 0.02 mg/L Total Kjeddah Nitrogen ND 0.01 mg/L Aduminum ND 0.001 mg/L Aluminum ND 0.001 mg/L Arsenic ND 0.001 mg/L Bary ND 0.005 mg/L Codmium ND 0.001 mg/L Codmium ND 0.001 mg/L	Alkalinity, total	ND	5	mg/L					
Colour ND 2 TCU Colour, apparent ND 2 ACU Conductivity ND 5 Us/cm Phenolics ND 0.001 mg/L Total Dissolved Solids ND 0.02 mg/L Sulphide ND 0.01 mg/L Total Kjeldahl Nitrogen ND 0.1 mg/L Turbidity ND 0.001 mg/L Mercury ND 0.001 mg/L Aluminum ND 0.001 mg/L Antimony ND 0.001 mg/L Barylin ND 0.001 mg/L Barylin ND 0.001 mg/L Cadium ND 0.001 mg/L Barylin ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND<	Ammonia as N	ND	0.01	mg/L					
Colour, apparent ND 2 ACU Conductivity ND 5 uS/cm Phenolics ND 0.001 mg/L Stulphide ND 0.02 mg/L Stulphide ND 0.1 mg/L Total Visoolved Solids ND 0.1 mg/L Total Visoolved Solids ND 0.1 mg/L Sulphide ND 0.1 mg/L Total Visoolved Solids ND 0.1 mg/L Total Visoolved Solids ND 0.1 mg/L Total Visoolved Solids ND 0.001 mg/L Total Visoolved Solids ND 0.001 mg/L Aluminum ND 0.001 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Goron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L	Dissolved Organic Carbon	ND	0.5	mg/L					
Conductivity ND 5 uS/cm Phenolics ND 0.001 mg/L Total Dissolved Solids ND 0.02 mg/L Sulphide ND 0.1 mg/L Tannin & Lignin ND 0.1 mg/L Total Kjeldahl Nitrogen ND 0.1 mg/L Turbidity ND 0.10 mg/L Mercury ND 0.001 mg/L Aluminum ND 0.001 mg/L Antimony ND 0.005 mg/L Beryllium ND 0.001 mg/L Beryllium ND 0.001 mg/L Cadmium	Colour	ND	2	TCU					
Phenolics ND 0.001 mg/L Total Dissolved Solids ND 10 mg/L Sulphide ND 0.02 mg/L Tanin & Lignin ND 0.1 mg/L Total Kjeldahi Nitrogen ND 0.1 mg/L Turbidity ND 0.1 mg/L Mercury ND 0.001 mg/L Aluminum ND 0.001 mg/L Atseind ND 0.001 mg/L Barium ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Chromium ND <td>Colour, apparent</td> <td>ND</td> <td>2</td> <td>ACU</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Colour, apparent	ND	2	ACU					
Total Dissolved Solids ND 10 mg/L Sulphide ND 0.02 mg/L Tannin & Lignin ND 0.1 mg/L Total Kjedahl Nitrogen ND 0.1 mg/L Turbidity ND 0.1 mg/L Mercury ND 0.01 ND Aluminum ND 0.001 mg/L Artimony ND 0.001 mg/L Barium ND 0.001 mg/L Beryllium ND 0.001 mg/L Cadmium ND 0.001 mg/L Chromium ND </td <td>Conductivity</td> <td></td> <td></td> <td>uS/cm</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Conductivity			uS/cm					
Total Dissolved Solids ND 10 mg/L Sulphide ND 0.02 mg/L Tannin & Lignin ND 0.1 mg/L Total Kjedahl Nitrogen ND 0.1 mg/L Turbidity ND 0.1 mg/L Mercury ND 0.01 mg/L Aluminum ND 0.001 mg/L Astenic ND 0.001 mg/L Astenic ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Chromium ND	Phenolics	ND	0.001	mg/L					
Sulphide ND 0.02 mg/L Tannin & Lignin ND 0.1 mg/L Total Kjeldah Nitrogen ND 0.1 mg/L Turbidity ND 0.1 NTU Metals ND 0.0001 mg/L Aturinum ND 0.001 mg/L Aturinum ND 0.005 mg/L Atrisony ND 0.001 mg/L Barium ND 0.001 mg/L Barium ND 0.001 mg/L Cadmium ND 0.001 mg/L Chromium ND 0.001 mg/L Chromium ND 0.001 mg/L Cobalt ND	Total Dissolved Solids		10						
Tannin & Lignin ND 0.1 mg/L Total Kjeldahl Nitrogen ND 0.1 mg/L Turbidity ND 0.10 NTU Metals ND 0.0001 mg/L Aluminum ND 0.001 mg/L Artimony ND 0.001 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Chromium ND 0.001 mg/L Chromium ND 0.001 mg/L Cobalt ND 0.001 mg/L Cobalt ND 0.005 mg/L Cobalt ND <t< td=""><td>Sulphide</td><td></td><td>0.02</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Sulphide		0.02						
Total Kjeldahl Nitrogen ND 0.1 mg/L Turbidity ND 0.1 NTU Metals ND 0.0001 mg/L Aluminum ND 0.001 mg/L Antimony ND 0.005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.001 mg/L Cadminum ND 0.001 mg/L Calcium ND 0.001 mg/L Cadirum ND 0.001 mg/L Chromium ND 0.001 mg/L Chromium ND 0.001 mg/L Chobalt ND 0.001 mg/L Chopper ND 0.005 mg/L	Tannin & Lignin		0.1						
Turbidity ND 0.1 NTU Metals ND 0.001 mg/L Aluminum ND 0.001 mg/L Antimony ND 0.005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadium ND 0.001 mg/L Cadium ND 0.001 mg/L Cadmium ND 0.001 mg/L Chromium ND 0.001 mg/L Chromium ND 0.001 mg/L Cobalt ND 0.005 mg/L Cobalt ND 0.005 mg/L	Total Kjeldahl Nitrogen		0.1						
Metals Mercury ND 0.001 mg/L Aluminum ND 0.001 mg/L Antimony ND 0.005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.005 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Calcium ND 0.001 mg/L Calcium ND 0.001 mg/L Cobalt ND 0.001 mg/L Cobalt ND 0.001 mg/L	Turbidity								
Mercury ND 0.001 mg/L Aluminum ND 0.001 mg/L Antimony ND 0.005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Beryllium ND 0.005 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Calcium ND 0.001 mg/L Chromium ND 0.001 mg/L Cobalt ND 0.001 mg/L Cobalt ND 0.005 mg/L Copper ND 0.005 mg/L	-								
Aluminum ND 0.001 mg/L Antimony ND 0.005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Boron ND 0.005 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.01 mg/L Chromium ND 0.001 mg/L Chromium ND 0.0005 mg/L Cobalt ND 0.0005 mg/L Copper ND 0.0005 mg/L <td>Mercury</td> <td>ND</td> <td>0.0001</td> <td>mg/L</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Mercury	ND	0.0001	mg/L					
Antimony ND 0.0005 mg/L Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Beryllium ND 0.005 mg/L Boron ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Chromium ND 0.1 mg/L Chomium ND 0.005 mg/L Cobalt ND 0.005 mg/L Copper ND 0.005 mg/L	Aluminum		0.001						
Arsenic ND 0.001 mg/L Barium ND 0.001 mg/L Beryllium ND 0.005 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Cadmium ND 0.001 mg/L Chromium ND 0.001 mg/L Chromium ND 0.001 mg/L Cobalt ND 0.005 mg/L Copper ND 0.005 mg/L	Antimony		0.0005						
Barium ND 0.001 mg/L Beryllium ND 0.005 mg/L Boron ND 0.01 mg/L Cadmium ND 0.001 mg/L Calcium ND 0.01 mg/L Chromium ND 0.1 mg/L Chromium ND 0.001 mg/L Cobalt ND 0.005 mg/L Cobalt ND 0.005 mg/L Copper ND 0.005 mg/L	Arsenic	ND	0.001						
BerylliumND0.0005mg/LBoronND0.01mg/LCadmiumND0.001mg/LCalciumND0.01mg/LChromiumND0.001mg/LCobaltND0.0005mg/LCopperND0.0005mg/L	Barium		0.001						
Cadmium ND 0.0001 mg/L Calcium ND 0.1 mg/L Chromium ND 0.001 mg/L Cobalt ND 0.005 mg/L Copper ND 0.005 mg/L	Beryllium		0.0005						
Cadmium ND 0.0001 mg/L Calcium ND 0.1 mg/L Chromium ND 0.001 mg/L Cobalt ND 0.005 mg/L Copper ND 0.005 mg/L	Boron		0.01						
Calcium ND 0.1 mg/L Chromium ND 0.001 mg/L Cobalt ND 0.0005 mg/L Copper ND 0.0005 mg/L	Cadmium		0.0001						
Chromium ND 0.001 mg/L Cobalt ND 0.0005 mg/L Copper ND 0.0005 mg/L	Calcium		0.1						
Cobalt ND 0.0005 mg/L Copper ND 0.0005 mg/L	Chromium								
Copper ND 0.0005 mg/L	Cobalt								
	Iron	ND	0.1	mg/L					



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analyte

Method Quality Control: Blank

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023

Project Description: 100554.003

Notes

Reporting

Limit

Units

Result

%REC

Limit

%REC

RPD

Limit

RPD



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analyte

Anions Chloride

Fluoride

Nitrate as N

Nitrite as N

General Inorganics Alkalinity, total

Dissolved Organic Carbon

Ammonia as N

Sulphate

Method Quality Control: Duplicate

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023

Project Description: 100554.003

Notes

Colour	ND	2	TCU	ND	NC	12
Colour, apparent	36	2	ACU	37	2.7	12
Conductivity	984	5	uS/cm	1030	4.5	5
рН	8.0	0.1	pH Units	8.0	0.2	3.3
Phenolics	0.002	0.001	mg/L	ND	NC	10
Total Dissolved Solids	572	10	mg/L	588	2.8	10
Sulphide	ND	0.02	mg/L	ND	NC	10
Tannin & Lignin	ND	0.1	mg/L	ND	NC	11
Total Kjeldahl Nitrogen	0.25	0.1	mg/L	0.31	NC	16
Turbidity	5.0	0.1	NTU	5.0	1.8	10
Metals						
Mercury	ND	0.0001	mg/L	ND	NC	20
Aluminum	0.056	0.001	mg/L	0.062	10.5	20
Antimony	ND	0.0005	mg/L	ND	NC	20
Arsenic	ND	0.001	mg/L	ND	NC	20
Barium	0.218	0.001	mg/L	0.212	2.7	20
Beryllium	ND	0.0005	mg/L	ND	NC	20
Boron	0.07	0.01	mg/L	0.07	0.8	20
Cadmium	ND	0.0001	mg/L	ND	NC	20
Calcium	84.6	0.1	mg/L	84.9	0.3	20
Chromium	ND	0.001	mg/L	ND	NC	20

Source

Result

143

0.12

ND

ND

83.4

267

0.187

1.5

Units

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

Reporting

Limit

1

0.1

0.1

0.05

1

5

0.01

0.5

Result

143

0.13

ND

ND

83.9

267

ND

1.4

%REC

Limit

%REC

RPD

Limit

20

20

20

20

10

14

17.7

37

RPD

0.2

4.1

NC

NC

0.6

0.0

NC

10.0



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analyte

Cobalt

Copper

Iron

Lead

Nickel

Silver

Sodium

Thallium

Uranium

Zinc

E. coli

Total Coliforms

Fecal Coliforms

Vanadium

Microbiological Parameters

Heterotrophic Plate Count

Magnesium

Manganese

Molybdenum

Potassium

Selenium

Method Quality Control: Duplicate

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023

Project Description: 100554.003

Notes

BAC01

BAC01

BAC04

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HIL	ILL
--	-----

Source

Result

ND

ND

0.4

ND

42.7

0.029

0.0062

ND

6.3

ND

ND

61.9

ND

0.0002

ND

ND

ND

ND

ND

30

Units

mg/L

CFU/100mL

CFU/100mL

CFU/100mL

CFU/mL

Reporting

Limit

0.0005

0.0005

0.1

0.0001

0.2

0.005

0.0005

0.001

0.1

0.001

0.0001

0.2

0.001

0.0001

0.0005

0.005

1

1

1

10

Result

ND

ND

0.4

ND

43.3

0.029

0.0059

ND

6.3

ND

ND

64.1

ND

0.0001

ND

ND

ND

ND

ND

10

%REC

Limit

%REC

RPD

Limit

20

20

20

20

20

20

20

20

20

20

20

20

20

20

20

20

30

30

30

30

RPD

NC

NC

1.0

NC

1.4

0.6

4.0

NC

0.2

NC

NC

3.5

NC

3.4

NC

NC

NC

NC

NC

100.0



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Calcium

Cobalt

Copper

Iron

Lead

Magnesium

Manganese

Molybdenum

Chromium

Method Quality

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	153	1	mg/L	143	101	70-124			
Fluoride	0.96	0.1	mg/L	0.12	83.4	70-130			
litrate as N	1.05	0.1	mg/L	ND	105	77-126			
litrite as N	0.872	0.05	mg/L	ND	87.2	82-115			
Sulphate	94.8	1	mg/L	83.4	113	74-126			
General Inorganics									
mmonia as N	1.25	0.01	mg/L	0.187	106	81-124			
issolved Organic Carbon	11.1	0.5	mg/L	1.6	95.0	60-133			
henolics	0.028	0.001	mg/L	ND	110	67-133			
otal Dissolved Solids	100	10	mg/L	ND	100	75-125			
ulphide	0.50	0.02	mg/L	ND	100	79-115			
annin & Lignin	1.1	0.1	mg/L	ND	106	71-113			
otal Kjeldahl Nitrogen	1.30	0.1	mg/L	0.31	99.3	81-126			
letals									
lercury	0.0026	0.0001	mg/L	ND	85.8	70-130			
luminum	103	0.001	mg/L	62.2	82.1	80-120			
rsenic	54.5	0.001	mg/L	0.076	109	80-120			
arium	250	0.001	mg/L	212	75.2	80-120			QM-07
eryllium	46.5	0.0005	mg/L	0.0228	93.0	80-120			
oron	108	0.01	mg/L	71.3	72.5	80-120			QM-07
admium	47.3	0.0001	mg/L	0.0022	94.6	80-120			

80-120

80-120

80-120

80-120

80-120

80-120

80-120

80-120

80-120

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023

Project Description: 100554.003

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL

ND

0.502

0.0342

0.147

360

0.0343

42700

29.3

6.17

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

10700

53.3

50.0

46.4

2730

42.0

49200

80.2

53.6

0.1

0.001

0.0005

0.0005

0.1

0.0001

0.2

0.005

0.0005

107

106

99.9

92.5

94.6

84.0

64.5

102

94.8

QM-07



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Nickel	49.6	0.001	mg/L	0.858	97.5	80-120			
Potassium	16100	0.1	mg/L	6320	97.5	80-120			
Selenium	47.1	0.001	mg/L	ND	94.1	80-120			
Silver	43.8	0.0001	mg/L	ND	87.5	80-120			
Sodium	10600	0.2	mg/L	ND	106	80-120			
Thallium	45.1	0.001	mg/L	0.006	90.1	80-120			
Uranium	49.8	0.0001	mg/L	0.154	99.4	80-120			
Vanadium	55.0	0.0005	mg/L	0.181	110	80-120			
Zinc	44.9	0.005	mg/L	0.921	88.0	80-120			

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 02-Nov-2023

Order Date: 26-Oct-2023

Project Description: 100554.003

Qua	alifi	ier N	otes:	
		-		

Login Qualifiers :		Container and COC sample IDs don't match - All bottles, with the exception of 1 x bacteria bottle are labelled as PW4-3hr, chain of custody reads TW4-3hr. Applies to Samples: TW4-3hr
Sample Qualifiers :	1:	Greater than 200 CFU of background colonies present. This may interfere with target growth and ability of the analyst to count E. coli & Total Coliform. The target colonies may be under-represented.
QC Qualifiers:		
	BAC01	Greater than 200 CFU of background colonies present. This may interfere with target growth and ability of the analyst to count E. coli & Total Coliform. The target colonies may be under-represented.
	BAC04	Duplicate QC data falls within method prescribed 95% confidence limits.
	QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.
<u>Sample Data Revisions:</u> None		

Work Order Revisions / Comments:

All bottles read PW4-3hr. 1 bacteria bottle reads TW-3hr.

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



TW5 3hr

TW5 6hr

TW5 6hr (Filtered)

1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Brent Redmond	Report Date: 13-Nov-2023
Client PO:	Order Date: 7-Nov-2023
Project: 100554.003	Order #: 2345203
Custody: 19522	Order #. 2345203
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	
Paracel ID Client ID	

Approved By:

2345203-01 2345203-02

2345203-03

Nos

Dale Robertson, BSc

Laboratory Director



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis Summary Table

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023

Project Description: 100554.003

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	9-Nov-23	9-Nov-23
Ammonia, as N	EPA 351.2 - Auto Colour	8-Nov-23	8-Nov-23
Anions	EPA 300.1 - IC	8-Nov-23	8-Nov-23
Colour	SM2120 - Spectrophotometric	8-Nov-23	8-Nov-23
Colour, apparent	SM2120 - Spectrophotometric	8-Nov-23	8-Nov-23
Conductivity	EPA 9050A- probe @25 °C	9-Nov-23	9-Nov-23
Dissolved Organic Carbon	MOE 3247B - Combustion IR	10-Nov-23	13-Nov-23
E. coli	MOE E3407	8-Nov-23	8-Nov-23
Fecal Coliform	SM 9222D	8-Nov-23	8-Nov-23
Heterotrophic Plate Count	SM 9215C	8-Nov-23	8-Nov-23
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	9-Nov-23	9-Nov-23
Metals, ICP-MS	EPA 200.8 - ICP-MS	8-Nov-23	8-Nov-23
рН	EPA 150.1 - pH probe @25 °C	9-Nov-23	9-Nov-23
Phenolics	EPA 420.2 - Auto Colour, 4AAP	8-Nov-23	8-Nov-23
Hardness	Hardness as CaCO3	8-Nov-23	8-Nov-23
Sulphide	SM 4500SE - Colourimetric	9-Nov-23	10-Nov-23
Tannin/Lignin	SM 5550B - Colourimetric	9-Nov-23	9-Nov-23
Total Coliform	MOE E3407	8-Nov-23	8-Nov-23
Total Dissolved Solids	SM 2540C - gravimetric, filtration	8-Nov-23	9-Nov-23
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	8-Nov-23	10-Nov-23
Turbidity	SM 2130B - Turbidity meter	8-Nov-23	8-Nov-23



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023

Project Description: 100554.003

	Client ID:	TW5 3hr	TW5 6hr	TW5 6hr (Filtered)			
	Sample Date:	07-Nov-23 11:00	07-Nov-23 14:00	07-Nov-23 14:00	_	_	-
	Sample ID:	2345203-01	2345203-02	2345203-03	_	-	-
	Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
	MDL/Units	U U	, , , , , , , , , , , , , , , , , , ,	Ŭ			
Microbiological Parameters	ĮĮ				ļ		
E. coli	1 CFU/100mL	ND	ND	-	-	-	-
Total Coliforms	1 CFU/100mL	3	10	-	-	-	-
Fecal Coliforms	1 CFU/100mL	ND	ND	-	-	-	-
Heterotrophic Plate Count	10 CFU/mL	20	10	-	-	-	-
General Inorganics							
Alkalinity, total	5 mg/L	238	238	-	-	-	-
Ammonia as N	0.01 mg/L	0.12	0.08	-	-	-	-
Dissolved Organic Carbon	0.5 mg/L	1.0	0.7	-	-	-	-
Colour, apparent	2 ACU	33	32	-	-	-	-
Colour	2 TCU	2	<2	-	-	-	-
Conductivity	5 uS/cm	758	751	-	-	-	-
Hardness	mg/L	356	362	-	-	-	-
рН	0.1 pH Units	8.1	8.1	-	-	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-	-	-
Total Dissolved Solids	10 mg/L	416	410	-	-	-	-
Sulphide	0.02 mg/L	<0.02	<0.02	-	-	-	-
Tannin & Lignin	0.1 mg/L	<0.1	<0.1	-	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.2	0.1	-	-	-	-
Turbidity	0.1 NTU	5.5	5.2	-	-	-	-
Anions							
Chloride	1 mg/L	68	68	-	-	-	-
Fluoride	0.1 mg/L	0.1	0.1	-	-	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-	-	-
Sulphate	1 mg/L	65	64	-	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023

Project Description: 100554.003

	Client ID:	TW5 3hr	TW5 6hr	TW5 6hr (Filtered)	-		
	Sample Date:	07-Nov-23 11:00	07-Nov-23 14:00	07-Nov-23 14:00	-	-	
	Sample ID:	2345203-01	2345203-02	2345203-03	-		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
	MDL/Units						
Metals	• • •						
Mercury	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Aluminum	0.001 mg/L	-	0.087	0.002	-	-	-
Antimony	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Arsenic	0.001 mg/L	-	<0.001	<0.001	-	-	-
Barium	0.001 mg/L	-	0.152	0.147	-	-	-
Beryllium	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Boron	0.01 mg/L	-	0.04	0.04	-	-	-
Cadmium	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Calcium	0.1 mg/L	75.7	74.3	76.1	-	-	-
Chromium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Cobalt	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Copper	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Iron	0.1 mg/L	0.4	0.4	0.3	-	-	-
Lead	0.0001 mg/L	-	0.0001	<0.0001	-	-	-
Magnesium	0.2 mg/L	40.5	42.9	41.5	-	-	-
Manganese	0.005 mg/L	0.026	0.025	0.024	-	-	-
Molybdenum	0.0005 mg/L	-	0.0085	0.0087	-	-	-
Nickel	0.001 mg/L	-	<0.001	<0.001	-	-	-
Potassium	0.1 mg/L	3.4	3.5	3.4	-	-	-
Selenium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Silver	0.0001 mg/L	-	<0.0001	<0.0001	-	-	-
Sodium	0.2 mg/L	37.1	37.3	36.2	-	-	-
Strontium	0.01 mg/L	-	0.54	0.53	-	-	-
Thallium	0.001 mg/L	-	<0.001	<0.001	-	-	-
Uranium	0.0001 mg/L	-	0.0003	0.0003	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Metals

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023

Client ID:	TW5 3hr	TW5 6hr	TW5 6hr (Filtered)	-		
Sample Date:	07-Nov-23 11:00	07-Nov-23 14:00	07-Nov-23 14:00	-	-	-
Sample ID:	2345203-01	2345203-02	2345203-03	-		
Matrix:	Drinking Water	Drinking Water	Drinking Water	-		
MDL/Units						

Vanadium	0.0005 mg/L	-	<0.0005	<0.0005	-	-	-
Zinc	0.005 mg/L	-	<0.005	0.007	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Blank

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023

Project Description: 100554.003

Anions Chloride Fluoride	ND ND	1				
		1				
Fluoride	ND	1	mg/L			
	ND	0.1	mg/L			
Nitrate as N	ND	0.1	mg/L			
Nitrite as N	ND	0.05	mg/L			
Sulphate	ND	1	mg/L			
General Inorganics						
Alkalinity, total	ND	5	mg/L			
Ammonia as N	ND	0.01	mg/L			
Dissolved Organic Carbon	ND	0.5	mg/L			
Colour	ND	2	TCU			
Colour, apparent	ND	2	ACU			
Conductivity	ND	5	uS/cm			
Phenolics	ND	0.001	mg/L			
Total Dissolved Solids	ND	10	mg/L			
Sulphide	ND	0.02	mg/L			
Tannin & Lignin	ND	0.1	mg/L			
Total Kjeldahl Nitrogen	ND	0.1	mg/L			
Turbidity	ND	0.1	NTU			
Metals						
Mercury	ND	0.0001	mg/L			
Aluminum	ND	0.001	mg/L			
Antimony	ND	0.0005	mg/L			
Arsenic	ND	0.001	mg/L			
Barium	ND	0.001	mg/L			
Beryllium	ND	0.0005	mg/L			
Boron	ND	0.01	mg/L			
Cadmium	ND	0.0001	mg/L			
Calcium	ND	0.1	mg/L			
Chromium	ND	0.001	mg/L			
Cobalt	ND	0.0005	mg/L			
Copper	ND	0.0005	mg/L			
Iron	ND	0.1	mg/L			



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Blank

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023

Project Description: 100554.003

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Lead	ND	0.0001	mg/L					
Magnesium	ND	0.2	mg/L					
Manganese	ND	0.005	mg/L					
Molybdenum	ND	0.0005	mg/L					
Nickel	ND	0.001	mg/L					
Potassium	ND	0.1	mg/L					
Selenium	ND	0.001	mg/L					
Silver	ND	0.0001	mg/L					
Sodium	ND	0.2	mg/L					
Strontium	ND	0.01	mg/L					
Thallium	ND	0.001	mg/L					
Uranium	ND	0.0001	mg/L					
Vanadium	ND	0.0005	mg/L					
Zinc	ND	0.005	mg/L					
Microbiological Parameters								
E. coli	ND	1	CFU/100mL					
Total Coliforms	ND	1	CFU/100mL					
Fecal Coliforms	ND	1	CFU/100mL					
Heterotrophic Plate Count	ND	10	CFU/mL					



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Duplicate

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023

Project Description: 100554.003

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L	ND			NC	20	
Fluoride	ND	0.1	mg/L	ND			NC	20	
Nitrate as N	0.11	0.1	mg/L	0.11			0.6	20	
Nitrite as N	ND	0.05	mg/L	ND			NC	20	
Sulphate	5.01	1	mg/L	4.96			0.9	20	
General Inorganics									
Alkalinity, total	200	5	mg/L	203			1.7	14	
Ammonia as N	0.118	0.01	mg/L	0.122			3.4	17.7	
Dissolved Organic Carbon	0.6	0.5	mg/L	0.7			19.6	37	
Colour	2	2	TCU	2			0.0	12	
Colour, apparent	33	2	ACU	33			0.0	12	
Conductivity	511	5	uS/cm	516			1.0	5	
pН	8.1	0.1	pH Units	8.0			0.7	3.3	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Total Dissolved Solids	794	10	mg/L	812			2.2	10	
Sulphide	ND	0.02	mg/L	ND			NC	10	
Tannin & Lignin	ND	0.1	mg/L	ND			NC	11	
Total Kjeldahl Nitrogen	ND	0.1	mg/L	ND			NC	16	
Turbidity	1.8	0.1	NTU	1.8			1.1	10	
Metals									
Mercury	ND	0.0001	mg/L	ND			NC	20	
Aluminum	0.082	0.001	mg/L	0.087			6.8	20	
Antimony	ND	0.0005	mg/L	ND			NC	20	
Arsenic	ND	0.001	mg/L	ND			NC	20	
Barium	0.156	0.001	mg/L	0.152			2.9	20	
Beryllium	ND	0.0005	mg/L	ND			NC	20	
Boron	0.04	0.01	mg/L	0.04			3.9	20	
Cadmium	ND	0.0001	mg/L	ND			NC	20	
Calcium	75.9	0.1	mg/L	74.3			2.2	20	
Chromium	ND	0.001	mg/L	ND			NC	20	
			0						



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analyte

Cobalt

Copper

Iron

Lead

Nickel

Silver

Sodium

Thallium

Uranium

Zinc

E. coli

Total Coliforms

Fecal Coliforms

Vanadium

Microbiological Parameters

Heterotrophic Plate Count

Magnesium

Manganese

Molybdenum

Potassium

Selenium

Method Quality Control: Duplicate

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023

Project Description: 100554.003

Notes

OTTAWA + MISSISSAUGA	 HAMILTON 	KINGSTON	 LONDON 	 NIAGARA 	 WINDSOR 	 RICHMOND 	HILL
----------------------	------------------------------	----------	----------------------------	-----------------------------	-----------------------------	------------------------------	------

Source

Result

ND

ND

0.4

0.0001

42.9

0.025

0.0085

ND

3.5

ND

ND

37.3

ND

0.0003

ND

ND

ND

3

ND

20

Units

mg/L

CFU/100mL

CFU/100mL

CFU/100mL

CFU/mL

Reporting

Limit

0.0005

0.0005

0.1

0.0001

0.2

0.005

0.0005

0.001

0.1

0.001

0.0001

0.2

0.001

0.0001

0.0005

0.005

1

1

1

10

Result

ND

ND

0.4

0.0001

40.8

0.025

0.0085

ND

3.5

ND

ND

35.4

ND

0.0003

ND

ND

ND

3

ND

ND

%REC

Limit

%REC

RPD

Limit

20

20

20

20

20

20

20

20

20

20

20

20

20

20

20

20

30

30

30

30

RPD

NC

NC

4.0

17.6

5.0

0.9

1.0

NC

1.2

NC

NC

5.1

NC

2.9

NC

NC

NC

0.0

NC

NC



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	11.5	1	mg/L	ND	115	70-124			
Fluoride	0.98	0.1	mg/L	ND	98.4	70-130			
Nitrate as N	1.13	0.1	mg/L	0.11	102	77-126			
Nitrite as N	1.06	0.05	mg/L	ND	106	82-115			
Sulphate	15.5	1	mg/L	4.96	106	70-130			
General Inorganics									
Ammonia as N	1.13	0.01	mg/L	0.122	100	81-124			
Dissolved Organic Carbon	10.8	0.5	mg/L	0.7	100	60-133			
Phenolics	0.027	0.001	mg/L	ND	107	67-133			
Total Dissolved Solids	80.0	10	mg/L	ND	80.0	75-125			
Sulphide	0.48	0.02	mg/L	ND	96.8	79-115			
Tannin & Lignin	1.0	0.1	mg/L	ND	99.9	71-113			
Total Kjeldahl Nitrogen	1.05	0.1	mg/L	ND	105	81-126			
Metals									
Mercury	0.0028	0.0001	mg/L	ND	92.7	70-130			
Aluminum	134	0.001	mg/L	87.5	93.5	80-120			
Arsenic	55.1	0.001	mg/L	0.092	110	80-120			
Barium	197	0.001	mg/L	152	90.2	80-120			
Beryllium	53.2	0.0005	mg/L	0.0211	106	80-120			
Boron	88.8	0.01	mg/L	41.4	95.0	80-120			
Cadmium	49.3	0.0001	mg/L	0.0056	98.6	80-120			
Calcium	12300	0.1	mg/L	ND	123	80-120			QS-02
Chromium	58.1	0.001	mg/L	0.620	115	80-120			
Cobalt	53.2	0.0005	mg/L	0.0559	106	80-120			
Copper	49.8	0.0005	mg/L	0.174	99.3	80-120			
Iron	3030	0.1	mg/L	426	104	80-120			
Lead	47.1	0.0001	mg/L	0.106	94.1	80-120			
Magnesium	12200	0.2	mg/L	ND	122	80-120			QS-02
Manganese	79.3	0.005	mg/L	25.5	108	80-120			
Molybdenum	58.6	0.0005	mg/L	8.54	100	80-120			

Order #: 2345203

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023

Project Description: 100554.003



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Nickel	52.7	0.001	mg/L	0.594	104	80-120			
Potassium	14000	0.1	mg/L	3480	105	80-120			
Selenium	49.6	0.001	mg/L	0.017	99.1	80-120			
Silver	50.3	0.0001	mg/L	0.0005	101	80-120			
Sodium	11800	0.2	mg/L	ND	118	80-120			
Thallium	46.8	0.001	mg/L	0.003	93.6	80-120			
Uranium	49.2	0.0001	mg/L	0.261	97.8	80-120			
Vanadium	57.9	0.0005	mg/L	0.233	115	80-120			
Zinc	45.3	0.005	mg/L	0.333	90.0	80-120			

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Qualifier Notes:

Sample Qualifiers :

QC Qualifiers:

QS-02 Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 13-Nov-2023

Order Date: 7-Nov-2023



PW-1794

PW-1826

PW-1850

PW-1858

PW-1922

1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Brent Redmond	Report Date: 14-Nov-2023
Client PO: Cedarlakes	Order Date: 8-Nov-2023
Project: 100554.003	Order #: 2345308
Custody: 12636	
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	
Paracel ID Client ID	

Approved By:

2345308-01 2345308-02

2345308-03

2345308-04

2345308-05

Non

Dale Robertson, BSc

Laboratory Director



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Analysis

Anions

Colour

E. coli

pН

Phenolics

Hardness

Sulphide

Turbidity

Tannin/Lignin

Total Coliform

Total Dissolved Solids

Total Kjeldahl Nitrogen

Analysis Summary Table

Alkalinity, total to pH 4.5

Dissolved Organic Carbon

Heterotrophic Plate Count

Ammonia, as N

Colour, apparent

Conductivity

Fecal Coliform

Metals, ICP-MS

Report Date: 14-Nov-2023

Order Date: 8-Nov-2023

Analysis Date

9-Nov-23

13-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

13-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

10-Nov-23

9-Nov-23

10-Nov-23

10-Nov-23

10-Nov-23

9-Nov-23

9-Nov-23

13-Nov-23

10-Nov-23

9-Nov-23

Project Description: 100554.003

Extraction Date

9-Nov-23

13-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

13-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

10-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

9-Nov-23

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL	OTTAWA = MIS	SISSAUGA + HAMILTOI	KINGSTON	 LONDON 	NIAGARA	 WINDSOR 	RICHMOND HILL	
---	--------------	---------------------	----------	----------------------------	---------	-----------------------------	---------------	--

Method Reference/Description

EPA 310.1 - Titration to pH 4.5

SM2120 - Spectrophotometric

SM2120 - Spectrophotometric

EPA 9050A- probe @25 °C

MOE 3247B - Combustion IR

EPA 150.1 - pH probe @25 °C

EPA 420.2 - Auto Colour, 4AAP

SM 2540C - gravimetric, filtration

EPA 351.2 - Auto Colour, digestion

SM 4500SE - Colourimetric

SM 2130B - Turbidity meter

SM 5550B - Colourimetric

EPA 351.2 - Auto Colour

EPA 300.1 - IC

MOE E3407

SM 9222D

SM 9215C

MOE E3407

EPA 200.8 - ICP-MS

Hardness as CaCO3



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Report Date: 14-Nov-2023

Order Date: 8-Nov-2023

Project Description: 100554.003

	Client ID:	PW-1794	PW-1826	PW-1850	PW-1858		
	Sample Date:	08-Nov-23 10:30	08-Nov-23 11:30	08-Nov-23 12:30	08-Nov-23 13:30	-	-
	Sample ID:	2345308-01	2345308-02	2345308-03	2345308-04		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	Drinking Water		
	MDL/Units						
Microbiological Parameters	•						
E. coli	1 CFU/100mL	ND	ND	ND	ND	-	-
Total Coliforms	1 CFU/100mL	ND	ND	ND	ND	-	-
Fecal Coliforms	1 CFU/100mL	ND	ND	ND	ND	-	-
Heterotrophic Plate Count	10 CFU/mL	<10	<10	100	10	-	-
General Inorganics							
Alkalinity, total	5 mg/L	299	288	304	281	-	-
Ammonia as N	0.01 mg/L	0.05	0.07	0.06	0.06	-	-
Dissolved Organic Carbon	0.5 mg/L	1.1	1.0	1.0	1.1	-	-
Colour, apparent	2 ACU	228	28	159	85	-	-
Colour	2 TCU	2	<2	<2	<2	-	-
Conductivity	5 uS/cm	1420	1400	916	1380	-	-
Hardness	mg/L	474	468	434	458	-	-
рН	0.1 pH Units	7.6	7.7	7.8	7.7	-	-
Phenolics	0.001 mg/L	0.001	<0.001	<0.001	<0.001	-	-
Total Dissolved Solids	10 mg/L	844	788	534	764	-	-
Sulphide	0.02 mg/L	0.05	<0.02	0.04	<0.02	-	-
Tannin & Lignin	0.1 mg/L	0.2	<0.1	<0.1	<0.1	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.1	0.1	0.1	0.2	-	-
Turbidity	0.1 NTU	45.4	3.8	26.7	13.5	-	-
Anions							
Chloride	1 mg/L	245	237	84	231	-	-
Fluoride	0.1 mg/L	<0.1	<0.1	<0.1	<0.1	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05	-	-
Sulphate	1 mg/L	119	118	76	113	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Report Date: 14-Nov-2023

Order Date: 8-Nov-2023

	Client ID: Sample Date: Sample ID: Matrix:	PW-1794 08-Nov-23 10:30 2345308-01 Drinking Water	PW-1826 08-Nov-23 11:30 2345308-02 Drinking Water	PW-1850 08-Nov-23 12:30 2345308-03 Drinking Water	PW-1858 08-Nov-23 13:30 2345308-04 Drinking Water	-	-
Г	MDL/Units	Drinking Water	Difficing Water	Difficing Water	Drinking Water		
Metals	I						
Calcium	0.1 mg/L	116	112	93.9	109	-	-
Iron	0.1 mg/L	2.6	0.4	2.0	1.0	-	-
Magnesium	0.2 mg/L	44.5	45.7	48.5	45.1	-	-
Manganese	0.005 mg/L	0.042	0.031	0.039	0.034	-	-
Potassium	0.1 mg/L	4.6	5.1	2.9	4.1	-	-
Sodium	0.2 mg/L	128	113	21.0	117	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Report Date: 14-Nov-2023

Order Date: 8-Nov-2023

Project Description: 100554.003

	Client ID:	PW-1922					
	Sample Date:	08-Nov-23 14:30				_	-
	Sample ID:	2345308-05					
	Matrix:	Drinking Water					
	MDL/Units	-					
Microbiological Parameters	ļļ			ļ	I		4
E. coli	1 CFU/100mL	ND	-	-	-	-	-
Total Coliforms	1 CFU/100mL	ND	-	-	-	-	-
Fecal Coliforms	1 CFU/100mL	ND	-	-	-	-	-
Heterotrophic Plate Count	10 CFU/mL	220	-	-	-	-	-
General Inorganics	•						
Alkalinity, total	5 mg/L	247	-	-	-	-	-
Ammonia as N	0.01 mg/L	0.08	-	-	-	-	-
Dissolved Organic Carbon	0.5 mg/L	1.3	-	-	-	-	-
Colour, apparent	2 ACU	120	-	-	-	-	-
Colour	2 TCU	<2	-	-	-	-	-
Conductivity	5 uS/cm	1230	-	-	-	-	-
Hardness	mg/L	421	-	-	-	-	-
рН	0.1 pH Units	7.8	-	-	-	-	-
Phenolics	0.001 mg/L	<0.001	-	-	-	-	-
Total Dissolved Solids	10 mg/L	678	-	-	-	-	-
Sulphide	0.02 mg/L	<0.02	-	-	-	-	-
Tannin & Lignin	0.1 mg/L	<0.1	-	-	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.1	-	-	-	-	-
Turbidity	0.1 NTU	19.4	-	-	-	-	-
Anions				-		•	
Chloride	1 mg/L	205	-	-	-	-	-
Fluoride	0.1 mg/L	<0.1	-	-	-	-	-
Nitrate as N	0.1 mg/L	<0.1	-	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-	-	-
Sulphate	1 mg/L	105	-	-	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Report Date: 14-Nov-2023

Order Date: 8-Nov-2023

Project Description: 100554.003

	Client ID: Sample Date: Sample ID: Matrix:	PW-1922 08-Nov-23 14:30 2345308-05 Drinking Water				-	-
	MDL/Units						
Metals					•		
Calcium	0.1 mg/L	99.2	-	-	-	-	-
Iron	0.1 mg/L	1.4	-	-	-	-	-
Magnesium	0.2 mg/L	42.0	-	-	-	-	-
Manganese	0.005 mg/L	0.041	-	-	-	-	-
Potassium	0.1 mg/L	4.2	-	-	-	-	-
Sodium	0.2 mg/L	90.0	-	-	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	1	mg/L					
Fluoride	ND	0.1	mg/L					
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
Sulphate	ND	1	mg/L					
General Inorganics								
Alkalinity, total	ND	5	mg/L					
Ammonia as N	ND	0.01	mg/L					
Dissolved Organic Carbon	ND	0.5	mg/L					
Colour	ND	2	TCU					
Colour, apparent	ND	2	ACU					
Conductivity	ND	5	uS/cm					
Phenolics	ND	0.001	mg/L					
Total Dissolved Solids	ND	10	mg/L					
Sulphide	ND	0.02	mg/L					
Tannin & Lignin	ND	0.1	mg/L					
Total Kjeldahl Nitrogen	ND	0.1	mg/L					
Turbidity	ND	0.1	NTU					
Metals								
Calcium	ND	0.1	mg/L					
Iron	ND	0.1	mg/L					
Magnesium	ND	0.2	mg/L					
Manganese	ND	0.005	mg/L					
Potassium	ND	0.1	mg/L					
Sodium	ND	0.2	mg/L					
Microbiological Parameters			5					
E. coli	ND	1	CFU/100mL					
Total Coliforms	ND	1	CFU/100mL					
Fecal Coliforms	ND	1	CFU/100mL					
Heterotrophic Plate Count	ND	10	CFU/mL					

Report Date: 14-Nov-2023

Order Date: 8-Nov-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Reporting

Limit

1

0.1

0.1

0.05

1

5

0.01

0.5

2

2

5

0.1

0.001

10

0.02

0.1

0.1

Result

205

ND

ND

ND

107

200

0.095

1.1

ND

228

511

8.1

ND

ND

ND

ND

0.13

Client PO: Cedarlakes

Analyte

Anions Chloride

Fluoride

Nitrate as N

Nitrite as N

General Inorganics Alkalinity, total

Dissolved Organic Carbon

Ammonia as N

Colour, apparent

Total Dissolved Solids

Total Kjeldahl Nitrogen

Conductivity

Phenolics

Sulphide

Tannin & Lignin

Sulphate

Colour

pН

Method Quality Control: Duplicate

Report Date: 14-Nov-2023

Order Date: 8-Nov-2023

Project Description: 100554.003

Notes

Turbidity	45.0	0.1	NTU	45.4	0.9	10	
Metals							
Calcium	105	0.1	mg/L	104	0.5	20	
Iron	ND	0.1	mg/L	ND	NC	20	
Magnesium	32.0	0.2	mg/L	34.2	6.6	20	
Manganese	ND	0.005	mg/L	ND	NC	20	
Potassium	3.6	0.1	mg/L	3.6	0.5	20	
Sodium	43.9	0.2	mg/L	47.1	7.2	20	
Microbiological Parameters							
E. coli	ND	1	CFU/100mL	ND	NC	30	BAC01
Total Coliforms	ND	1	CFU/100mL	ND	NC	30	BAC01
Fecal Coliforms	ND	1	CFU/100mL	ND	NC	30	

Source

Result

205

ND

ND

ND

105

203

0.077

1.0

2

228

516

8.0

ND

ND

ND

ND

0.12

Units

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

TCU

ACU

uS/cm

pH Units

mg/L

mg/L

mg/L

mg/L

mg/L

%REC

Limit

%REC

RPD

Limit

20

20

20

20

20

14

17.7

37

12

12

5

3.3

10

10

10

11

16

RPD

0.0

NC

NC

NC

1.2

1.7

NC

6.9

NC

0.0

1.0

0.7

NC

NC

NC

NC

7.2



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Heterotrophic Plate Count	ND	10	CFU/mL	ND			NC	30	

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL

Report Date: 14-Nov-2023

Order Date: 8-Nov-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Method Quality Control: Spike

Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
214	1	mg/L	205	92.6	70-124			
1.02	0.1	mg/L	ND	102	70-130			
1.02	0.1	mg/L	ND	102	77-126			
0.958	0.05	mg/L	ND	95.8	82-115			
114	1	mg/L	105	88.2	70-130			
1.08	0.01	mg/L	0.077	100	81-124			
11.4	0.5	mg/L	1.3	101	60-133			
0.027	0.001	mg/L	ND	108	67-133			
92.0	10	mg/L	ND	92.0	75-125			
0.48	0.02	mg/L	ND	96.8	79-115			
1.0	0.1	mg/L	ND	99.9	71-113			
1.14	0.1	mg/L	0.12	102	81-126			
11900	0.1	mg/L	ND	119	80-120			
2520	0.1	mg/L	11.4	100	80-120			
11400	0.2	mg/L	ND	114	80-120			
52.0	0.005	mg/L	1.21	101	80-120			
14300	0.1	mg/L	3630	107	80-120			
53200	0.2	mg/L	45000	82.1	80-120			
	214 1.02 1.02 0.958 114 1.08 11.4 0.027 92.0 0.48 1.0 1.14 11900 2520 11400 52.0 14300	Result Limit 214 1 1.02 0.1 1.02 0.1 0.958 0.05 114 1 1.08 0.01 11.4 0.5 0.027 0.001 92.0 10 0.48 0.02 1.0 0.1 1.14 0.1 11900 0.1 2520 0.1 11400 0.2 52.0 0.005 14300 0.1	Result Limit Units 214 1 mg/L 1.02 0.1 mg/L 1.02 0.1 mg/L 0.958 0.05 mg/L 114 1 mg/L 1.08 0.01 mg/L 1.08 0.01 mg/L 0.027 0.001 mg/L 92.0 10 mg/L 1.0 0.1 mg/L 1.14 0.1 mg/L 1.0 0.1 mg/L 1.14 0.1 mg/L 1.14 0.1 mg/L 1.1400 0.2 mg/L 11400 0.2 mg/L 11400 0.2 mg/L 114300 0.1 mg/L	Result Limit Units Result 214 1 mg/L 205 1.02 0.1 mg/L ND 1.02 0.1 mg/L ND 0.958 0.05 mg/L ND 114 1 mg/L 105 1.08 0.01 mg/L 0.077 11.4 0.5 mg/L ND 92.0 10 mg/L ND 92.0 10 mg/L ND 1.0 0.1 mg/L ND 1.14 0.1 mg/L ND 2520 0.1 mg/L ND 52.0 0.005 mg/L ND 52.0 0.005 mg/L 1.21 14300 0.1	Result Limit Units Result %REC 214 1 mg/L 205 92.6 1.02 0.1 mg/L ND 102 1.02 0.1 mg/L ND 102 0.958 0.05 mg/L ND 95.8 114 1 mg/L 105 88.2 1.08 0.01 mg/L 0.077 100 11.4 0.5 mg/L 1.3 101 0.027 0.001 mg/L ND 92.0 0.48 0.02 mg/L ND 96.8 1.0 0.1 mg/L ND 99.9 1.14 0.1 mg/L ND 99.9 1.14 0.1 mg/L ND 119 2520 0.1 mg/L ND 119 2520 0.1 mg/L ND 114 52.0 0.005 mg/L ND 114 <t< td=""><td>Result Limit Units Result %REC Limit 214 1 mg/L 205 92.6 70-124 1.02 0.1 mg/L ND 102 70-130 1.02 0.1 mg/L ND 102 70-130 1.02 0.1 mg/L ND 102 77-126 0.958 0.05 mg/L ND 95.8 82-115 114 1 mg/L 105 88.2 70-130 1.08 0.01 mg/L 0.077 100 81-124 11.4 0.5 mg/L 1.3 101 60-133 0.027 0.001 mg/L ND 108 67-133 92.0 10 mg/L ND 92.0 75-125 0.48 0.02 mg/L ND 96.8 79-115 1.0 0.1 mg/L ND 99.9 71-113 1.14 0.1 mg/L 1</td><td>Result Limit Units Result %REC Limit RPD 214 1 mg/L 205 92.6 70-124 1.02 0.1 mg/L ND 102 70-130 1.02 0.1 mg/L ND 102 77-126 0.958 0.05 mg/L ND 95.8 82-115 114 1 mg/L 105 88.2 70-130 1.08 0.01 mg/L ND 108 67-133 0.027 0.001 mg/L ND 92.0 75-125 0.48 0.02 mg/L ND 99.9 71-113 1.14 0.1 mg/L ND 199 80-120 11900 0.1</td><td>Result Limit Units Result %REC Limit RPD Limit 214 1 mg/L 205 92.6 70-124 102 102 102 103 1.02 0.1 mg/L ND 102 70-130 102 77-126 0.958 0.05 mg/L ND 95.8 82-115 114 1 mg/L 105 88.2 70-130 1.08 0.01 mg/L ND 95.8 82-115 114 1 mg/L 105 88.2 70-130 1.08 0.01 mg/L ND 95.8 82-115 114 1 mg/L 105 88.2 70-130 1.08 0.01 mg/L ND 108 67-133 92.0 75-125 0.48 0.02 mg/L ND 92.0 75-125 0.48 0.02 mg/L ND 99.9 71-113 1.0 0.1 mg/L 0.12 102 81-126</td></t<>	Result Limit Units Result %REC Limit 214 1 mg/L 205 92.6 70-124 1.02 0.1 mg/L ND 102 70-130 1.02 0.1 mg/L ND 102 70-130 1.02 0.1 mg/L ND 102 77-126 0.958 0.05 mg/L ND 95.8 82-115 114 1 mg/L 105 88.2 70-130 1.08 0.01 mg/L 0.077 100 81-124 11.4 0.5 mg/L 1.3 101 60-133 0.027 0.001 mg/L ND 108 67-133 92.0 10 mg/L ND 92.0 75-125 0.48 0.02 mg/L ND 96.8 79-115 1.0 0.1 mg/L ND 99.9 71-113 1.14 0.1 mg/L 1	Result Limit Units Result %REC Limit RPD 214 1 mg/L 205 92.6 70-124 1.02 0.1 mg/L ND 102 70-130 1.02 0.1 mg/L ND 102 77-126 0.958 0.05 mg/L ND 95.8 82-115 114 1 mg/L 105 88.2 70-130 1.08 0.01 mg/L ND 108 67-133 0.027 0.001 mg/L ND 92.0 75-125 0.48 0.02 mg/L ND 99.9 71-113 1.14 0.1 mg/L ND 199 80-120 11900 0.1	Result Limit Units Result %REC Limit RPD Limit 214 1 mg/L 205 92.6 70-124 102 102 102 103 1.02 0.1 mg/L ND 102 70-130 102 77-126 0.958 0.05 mg/L ND 95.8 82-115 114 1 mg/L 105 88.2 70-130 1.08 0.01 mg/L ND 95.8 82-115 114 1 mg/L 105 88.2 70-130 1.08 0.01 mg/L ND 95.8 82-115 114 1 mg/L 105 88.2 70-130 1.08 0.01 mg/L ND 108 67-133 92.0 75-125 0.48 0.02 mg/L ND 92.0 75-125 0.48 0.02 mg/L ND 99.9 71-113 1.0 0.1 mg/L 0.12 102 81-126

Report Date: 14-Nov-2023

Order Date: 8-Nov-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Report Date: 14-Nov-2023

Order Date: 8-Nov-2023

Project Description: 100554.003

<u>Qualifier Notes:</u> Login Qualifiers :		
Login Quainers .		Container(s) - Labeled improperly/insufficient information - 1 x 40 ml DOC vial is missing the client name, sample collection date/time.
		Applies to Samples: PW-1826 Container and COC sample IDs don't match - 500 ml general chemistry bottle reads as PW-1828, and 1 x 40 ml DOC vial is un-labelled, chain of custody reads as PW-1826. Applies to Samples: PW-1826
Sample Qualifiers :		
QC Qualifiers:		
	BAC01	Greater than 200 CFU of background colonies present. This may interfere with target growth and ability of the analyst to count E. coli & Total Coliform. The target colonies may be under-represented.
<u>Sample Data Revisions:</u> None		
Work Order Revisions / Cor None	<u>mments:</u>	
Other Report Notes:		
n/a: not applicable		
ND: Not Detected		
MDL: Method Dete	ection Limit	
Source Result: Da	ta used as s	ource for matrix and duplicate samples
%REC: Percent re	covery.	
RPD: Relative pero NC: Not Calculate		ce.
		r agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents e liable to you in connection with this work.



1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Brent Redmond	
	Report Date: 4-Dec-2023
Client PO:	Order Date: 28-Nov-2023
Project: 100554.003	0
Custody: 72256, 19053	Order #: 2348173
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	

 Paracel ID
 Client ID

 2348173-01
 PW-6266

 2348173-02
 PW-6342

Approved By:

Mark Froto

Mark Foto, M.Sc.

Lab Supervisor



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis Summary Table

Report Date: 04-Dec-2023

Order Date: 28-Nov-2023

Project Description: 100554.003

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	30-Nov-23	30-Nov-23
Ammonia, as N	EPA 351.2 - Auto Colour	30-Nov-23	30-Nov-23
Anions	EPA 300.1 - IC	4-Dec-23	4-Dec-23
Colour	SM2120 - Spectrophotometric	29-Nov-23	29-Nov-23
Colour, apparent	SM2120 - Spectrophotometric	29-Nov-23	29-Nov-23
Conductivity	EPA 9050A- probe @25 °C	30-Nov-23	30-Nov-23
Dissolved Organic Carbon	MOE 3247B - Combustion IR	29-Nov-23	30-Nov-23
E. coli	MOE E3407	29-Nov-23	29-Nov-23
Fecal Coliform	SM 9222D	29-Nov-23	29-Nov-23
Heterotrophic Plate Count	SM 9215C	29-Nov-23	29-Nov-23
Metals, ICP-MS	EPA 200.8 - ICP-MS	29-Nov-23	29-Nov-23
рН	EPA 150.1 - pH probe @25 °C	30-Nov-23	30-Nov-23
Phenolics	EPA 420.2 - Auto Colour, 4AAP	29-Nov-23	29-Nov-23
Hardness	Hardness as CaCO3	29-Nov-23	29-Nov-23
Sulphide	SM 4500SE - Colourimetric	1-Dec-23	1-Dec-23
Tannin/Lignin	SM 5550B - Colourimetric	1-Dec-23	1-Dec-23
Total Coliform	MOE E3407	29-Nov-23	29-Nov-23
Total Dissolved Solids	SM 2540C - gravimetric, filtration	1-Dec-23	1-Dec-23
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	29-Nov-23	29-Nov-23
Turbidity	SM 2130B - Turbidity meter	29-Nov-23	29-Nov-23



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 04-Dec-2023

Order Date: 28-Nov-2023

Project Description: 100554.003

	г						
	Client ID:	PW-6266	PW-6342	-	-		
	Sample Date:	28-Nov-23 10:30	28-Nov-23 11:30	-	-	-	-
	Sample ID:	2348173-01	2348173-02	-	-		
	Matrix:	Drinking Water	Drinking Water	-	-		
	MDL/Units						
Microbiological Parameters							
E. coli	1 CFU/100mL	ND	ND	-	-	-	-
Total Coliforms	1 CFU/100mL	ND	ND	-	-	-	-
Fecal Coliforms	1 CFU/100mL	ND	ND	-	-	-	-
Heterotrophic Plate Count	10 CFU/mL	90	<10	-	-	-	-
General Inorganics						-	
Alkalinity, total	5 mg/L	324	295	-	-	-	-
Ammonia as N	0.01 mg/L	0.12	0.18	-	-	-	-
Dissolved Organic Carbon	0.5 mg/L	6.2	3.8	-	-	-	-
Colour, apparent	2 ACU	167	92	-	-	-	-
Colour	2 TCU	6	3	-	-	-	-
Conductivity	5 uS/cm	1090	963	-	-	-	-
Hardness	mg/L	415	359	-	-	-	-
рН	0.1 pH Units	7.7	7.8	-	-	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-	-	-
Total Dissolved Solids	10 mg/L	672	534	-	-	-	-
Sulphide	0.02 mg/L	<0.02	<0.02	-	-	-	-
Tannin & Lignin	0.1 mg/L	0.3	0.1	-	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.3	0.3	-	-	-	-
Turbidity	0.1 NTU	19.2	11.8	-	-	-	-
Anions						-	
Chloride	1 mg/L	125	96	-	-	-	-
Fluoride	0.1 mg/L	<0.1	<0.1	-	-	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-	-	-
Sulphate	1 mg/L	98	81	-	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 04-Dec-2023

Order Date: 28-Nov-2023

	Client ID:	PW-6266	PW-6342	-	-		
	Sample Date:	28-Nov-23 10:30	28-Nov-23 11:30	-	-	-	-
	Sample ID:	2348173-01	2348173-02	-	-		
	Matrix:	Drinking Water	Drinking Water	-	-		
	MDL/Units						
Metals							•
Calcium	0.1 mg/L	109	95.3	-	-	-	-
Iron	0.1 mg/L	1.8	1.1	-	-	-	-
Magnesium	0.2 mg/L	34.6	29.4	-	-	-	-
Manganese	0.005 mg/L	0.228	0.116	-	-	-	-
Potassium	0.1 mg/L	1.9	2.1	-	-	-	-
Sodium	0.2 mg/L	51.4	46.9	-	-	-	-



Heterotrophic Plate Count

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	1	mg/L					
Fluoride	ND	0.1	mg/L					
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
Sulphate	ND	1	mg/L					
General Inorganics								
Alkalinity, total	ND	5	mg/L					
Ammonia as N	ND	0.01	mg/L					
Dissolved Organic Carbon	ND	0.5	mg/L					
Colour	ND	2	TCU					
Colour, apparent	ND	2	ACU					
Conductivity	ND	5	uS/cm					
Phenolics	ND	0.001	mg/L					
Total Dissolved Solids	ND	10	mg/L					
Sulphide	ND	0.02	mg/L					
Tannin & Lignin	ND	0.1	mg/L					
Total Kjeldahl Nitrogen	ND	0.1	mg/L					
Turbidity	ND	0.1	NTU					
Metals								
Calcium	ND	0.1	mg/L					
Iron	ND	0.1	mg/L					
Magnesium	ND	0.2	mg/L					
Manganese	ND	0.005	mg/L					
Potassium	ND	0.1	mg/L					
Sodium	ND	0.2	mg/L					
Microbiological Parameters								
E. coli	ND	1	CFU/100mL					
Total Coliforms	ND	1	CFU/100mL					
Fecal Coliforms	ND	1	CFU/100mL					

Report Date: 04-Dec-2023

Order Date: 28-Nov-2023

Project Description: 100554.003

CFU/mL

10

ND



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Duplicate

Report Date: 04-Dec-2023

Order Date: 28-Nov-2023

Project Description: 100554.003

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	6.00	1	mg/L	5.88			2.1	20	
Fluoride	0.32	0.1	mg/L	0.33			5.1	20	
Nitrate as N	0.11	0.1	mg/L	0.12			3.8	20	
Nitrite as N	ND	0.05	mg/L	ND			NC	20	
Sulphate	25.4	1	mg/L	24.8			2.2	20	
General Inorganics Alkalinity, total	316	5	mg/L	324			2.5	14	
Ammonia as N	0.115	0.01	mg/L	0.116			1.2	17.7	
Dissolved Organic Carbon	6.3	0.01	mg/L	6.2			1.7	37	
Colour	0.3 7	2	TCU	6			NC	12	
Colour, apparent	, 166	2	ACU	167			0.6	12	
Conductivity	1110	2 5	uS/cm	1090			1.5	5	
pH	7.8	5 0.1	pH Units	7.7			0.1	3.3	
Phenolics			mg/L	ND			NC	3.3 10	
Total Dissolved Solids	ND	0.001	mg/L	672			0.9	10	
	666	10		ND			NC		
Sulphide	ND	0.02	mg/L					10	
Tannin & Lignin	ND	0.1	mg/L	0.1			NC	11 10	
Total Kjeldahl Nitrogen	0.30	0.1	mg/L	0.33			10.9	16	
Turbidity	19.1	0.1	NTU	19.2			0.5	10	
Metals	54.0		100 CL	F4 O			0.0	20	
Calcium	51.0	0.1	mg/L	51.0			0.0	20	
Iron	0.5	0.1	mg/L	0.5			1.8	20	
Magnesium	18.7	0.2	mg/L	18.5			0.9	20	
Manganese	0.016	0.005	mg/L	0.015			9.4	20	
Potassium	2.1	0.1	mg/L	2.0			2.4	20	
Sodium	11.1	0.2	mg/L	11.2			0.8	20	
Microbiological Parameters							NO	20	
E. coli	ND	1	CFU/100mL	ND			NC	30	
Total Coliforms	ND	1	CFU/100mL	ND			NC	30	
Fecal Coliforms	ND	1	CFU/100mL	ND			NC	30	



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Heterotrophic Plate Count	80	10	CFU/mL	90			12.0	30	

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL

Page 7 of 11

Order #: 2348173

Report Date: 04-Dec-2023

Order Date: 28-Nov-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	16.4	1	mg/L	5.88	105	70-124			
Fluoride	1.20	0.1	mg/L	0.33	86.7	70-130			
Nitrate as N	1.15	0.1	mg/L	0.12	103	77-126			
Nitrite as N	1.08	0.05	mg/L	ND	108	82-115			
Sulphate	34.5	1	mg/L	24.8	97.3	70-130			
General Inorganics									
Ammonia as N	1.12	0.01	mg/L	0.116	100	81-124			
Dissolved Organic Carbon	14.1	0.5	mg/L	3.8	102	60-133			
Phenolics	0.026	0.001	mg/L	ND	106	67-133			
Total Dissolved Solids	96.0	10	mg/L	ND	96.0	75-125			
Sulphide	0.52	0.02	mg/L	ND	104	79-115			
Tannin & Lignin	1.0	0.1	mg/L	0.1	86.6	71-113			
Total Kjeldahl Nitrogen	1.14	0.1	mg/L	0.33	81.3	81-126			
Metals									
Calcium	57200	0.1	mg/L	51000	62.7	80-120			QM-07
Iron	2660	0.1	mg/L	462	88.1	80-120			
Magnesium	25800	0.2	mg/L	18500	73.2	80-120			QM-07
Manganese	62.7	0.005	mg/L	14.5	96.3	80-120			
Potassium	11600	0.1	mg/L	2000	96.1	80-120			
Sodium	19400	0.2	mg/L	11200	82.0	80-120			

Report Date: 04-Dec-2023

Order Date: 28-Nov-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Qualifier Notes:

Login Qualifiers :

Container(s) - Labeled improperly/insufficient information - Sample collection time on the containers read 11:30, chain of custody reads 10:30. Report as 11:30 as per the bottles, as directed by the client. Applies to Samples: PW-6342

Sample Qualifiers :

QC Qualifiers:

QM-07

-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Order #: 2348173

Report Date: 04-Dec-2023

Order Date: 28-Nov-2023



GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Brent Redmond	Report Date: 29-Sep-2023
Client PO:	Order Date: 25-Sep-2023
Project: 100554.003	Order #: 2339122
Custody: 3404	Order #. 2555122
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	
Paracel ID Client ID	

Approved By:

2339122-01

2339122-02

2339122-03

MW1

MW2 MW3

Nosa

Dale Robertson, BSc

Laboratory Director



Total Kjeldahl Nitrogen

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis Ammonia, as N

Anions

Analysis Summary Table

Report Date: 29-Sep-2023

Order Date: 25-Sep-2023

Analysis Date

28-Sep-23

26-Sep-23

27-Sep-23

Project Description: 100554.003

Extraction Date

28-Sep-23

26-Sep-23

27-Sep-23

Method Reference/Description

EPA 351.2 - Auto Colour, digestion

EPA 351.2 - Auto Colour

EPA 300.1 - IC



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 29-Sep-2023

Order Date: 25-Sep-2023

Project Description: 100554.003

	Client ID: Sample Date: Sample ID: Matrix:	2339122-01	MW2 25-Sep-23 14:13 2339122-02 Ground Water	MW3 25-Sep-23 11:53 2339122-03 Ground Water	- - - -	-	-
	MDL/Units						
General Inorganics							
Ammonia as N	0.01 mg/L	<0.01	0.12	0.06	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.2	1.6	1.3	-	-	-
Anions							
Nitrate as N	0.1 mg/L	3.4	<0.1	<0.1	-	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
General Inorganics								
Ammonia as N	ND	0.01	mg/L					
Total Kjeldahl Nitrogen	ND	0.1	mg/L					

Report Date: 29-Sep-2023

Order Date: 25-Sep-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Nitrate as N	ND	0.1	mg/L	ND			NC	20	
Nitrite as N	ND	0.05	mg/L	ND			NC	20	
General Inorganics									
Ammonia as N	ND	0.01	mg/L	ND			NC	18	
Total Kjeldahl Nitrogen	4.74	0.2	mg/L	4.54			4.3	16	

Report Date: 29-Sep-2023

Order Date: 25-Sep-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Nitrate as N	1.07	0.1	mg/L	ND	107	77-126			
Nitrite as N	1.02	0.05	mg/L	ND	102	82-115			
General Inorganics									
Ammonia as N	1.01	0.01	mg/L	ND	101	81-124			
Total Kjeldahl Nitrogen	1.04	0.1	mg/L	ND	104	81-126			

Report Date: 29-Sep-2023

Order Date: 25-Sep-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 29-Sep-2023

Order Date: 25-Sep-2023



GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Brent Redmond	
	Report Date: 2-Nov-2023
Client PO: Cedarlakes	Order Date: 27-Oct-2023
Project: 100554.003	Order #: 2343470
Custody: 73780	Order #. 2343470
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	

 Paracel ID
 Client ID

 2343470-01
 MW1

 2343470-02
 MW2

 2343470-03
 MW3

Approved By:

Mark Foto

Mark Foto, M.Sc.

Lab Supervisor



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	30-Oct-23	30-Oct-23

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL

Page 2 of 8

Order #: 2343470

Report Date: 02-Nov-2023

Order Date: 27-Oct-2023



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Anions Nitrate as N Nitrite as N Report Date: 02-Nov-2023

Order Date: 27-Oct-2023

Client ID: Sample Date: Sample ID: Matrix:		MW2 27-Oct-23 09:00 2343470-02 Ground Water	MW3 27-Oct-23 09:00 2343470-03 Ground Water	- - - -	-	-
MDL/Units						
0.1 mg/L	2.6	<0.1	<0.1	-	-	-
0.05 mg/L	0.09	<0.05	<0.05	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Analyte

Anions Nitrate as N

Nitrite as N

Method Quality Control: Blank

Report Date: 02-Nov-2023

Order Date: 27-Oct-2023

Project Description: 100554.003

Notes

RPD

Limit

RPD

%REC

Limit

%REC

OTTAWA - MISSISSAUGA - HAMILTON - KINGSTON - LONDON - NIAGARA - WINDSOR - RICHMOND HILL

Reporting

Limit

0.1

0.05

Units

mg/L

mg/L

Result

ND

ND



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Analyte

Anions Nitrate as N

Nitrite as N

Method Quality Control: Duplicate

Report Date: 02-Nov-2023

Order Date: 27-Oct-2023

Project Description: 100554.003

Notes

Source

Result

3.56

ND

Units

mg/L

mg/L

Reporting

Limit

0.1

0.05

Result

3.49

ND

%REC

Limit

%REC

RPD

Limit

20

20

RPD

2.0

NC



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions Nitrate as N Nitrite as N	4.56 0.988	0.1 0.05	mg/L mg/L	3.56 ND	100 98.8	77-126 82-115			

Order Date: 27-Oct-2023

Project Description: 100554.003

Order #: 2343470



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedarlakes

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 02-Nov-2023

Order Date: 27-Oct-2023

CALIBRATION SHEETS





CERTIFICATE OF CALIBRATION

The HORIBA Instrument listed below has been inspected and calibrated following the Manufacturer's specifications and methods.

strument Model: HORIBA U-22		Serial Number:	UNNOMASS	Calibration Date: November 6, 2023			
2-POINT pH	CONDUCTIVITY	TURBIDITY	DISSOLVED OXYGEN	OXIDIZATION-REDUCTION POTENTIAL	TEMPERATURE		
4.00 pH, 7.00 pH	4.49mS/cm ZERO CHECKED	0 & 100 NTU	9 mg/L @ 20.5 DegC SODIUM SULFITE ZERO	240mV	Fisher Scientific s/n 230606647		
AutoCal 4.00 pH Solution LOT # 3GE0924	AutoCal Solution LOT # 3GH0985	AutoCal Solution LOT# 3GH0985	Oakton Zero Solution LOT # 767903	Hanna ORP LOT # 8803			
Expiry Date: August 1, 2024	Expiry Date: August 1, 2024	Expiry Date: August 1, 2024	Expiry Date: December 1, 2023	Expiry Date: March 1, 2025			
рН 7.00 LOT # 3GH0684	@25 DegC LOT # 3GH0985	Turb. 100 NTU LOT # A2237A					
Expiry Date: August 1, 2025		Expiry Date: August 1, 2024					

The calibration standard used is considered to be a certified standard and is traceable to the National Institute of Standards and Technology (NIST). Certificate of Analysis is available upon request.

The instrument indicated above is now certified to be operating within the Manufacturer's specifications. This does not eliminate the requirement for regular maintenance and pre-use sensor response checks in order to ensure continued complete and accurate operating condition.

Certified By: Jeff Loney

Maxim Environmental and Safety Inc.

sales@maximenvironmental.com www.maximenvironmental.com



Head Office: 9 - 170 Ambassador Dr., Mississauga, ON L5T 2H9 (905)670-1304 | Toll Free (888)285-2324

Ottawa Office: 9 - 148 Colonnade Rd., Ottawa, ON K2E 7R4 (613)224-4747 | Toll Free (888)285-2324





CERTIFICATE OF CALIBRATION

The HORIBA Instrument listed below has been inspected and calibrated following the Manufacturer's specifications and methods.

strument Model: HORIBA U-22		Serial Number:	UNNOMASS	Calibration Date: November 6, 2023			
2-POINT pH	CONDUCTIVITY	TURBIDITY	DISSOLVED OXYGEN	OXIDIZATION-REDUCTION POTENTIAL	TEMPERATURE		
4.00 pH, 7.00 pH	4.49mS/cm ZERO CHECKED	0 & 100 NTU	9 mg/L @ 20.5 DegC SODIUM SULFITE ZERO	240mV	Fisher Scientific s/n 230606647		
AutoCal 4.00 pH Solution LOT # 3GE0924	AutoCal Solution LOT # 3GH0985	AutoCal Solution LOT# 3GH0985	Oakton Zero Solution LOT # 767903	Hanna ORP LOT # 8803			
Expiry Date: August 1, 2024	Expiry Date: August 1, 2024	Expiry Date: August 1, 2024	Expiry Date: December 1, 2023	Expiry Date: March 1, 2025			
рН 7.00 LOT # 3GH0684	@25 DegC LOT # 3GH0985	Turb. 100 NTU LOT # A2237A					
Expiry Date: August 1, 2025		Expiry Date: August 1, 2024					

The calibration standard used is considered to be a certified standard and is traceable to the National Institute of Standards and Technology (NIST). Certificate of Analysis is available upon request.

The instrument indicated above is now certified to be operating within the Manufacturer's specifications. This does not eliminate the requirement for regular maintenance and pre-use sensor response checks in order to ensure continued complete and accurate operating condition.

Certified By: Jeff Loney

Maxim Environmental and Safety Inc.

sales@maximenvironmental.com www.maximenvironmental.com



Head Office: 9 - 170 Ambassador Dr., Mississauga, ON L5T 2H9 (905)670-1304 | Toll Free (888)285-2324

Ottawa Office: 9 - 148 Colonnade Rd., Ottawa, ON K2E 7R4 (613)224-4747 | Toll Free (888)285-2324 Historical Water Quality Data Tables Paterson (2015) TABLE 2: Comparison of "Subdivision Package" Test Well #2A (Original and Present)

PARAMETER	UNITS	Original TW 2A (Feb 8, 2010) 6 Hour	Present TW 2A (Jun 19, 2015) 6 Hour
MICROBIOLOGICAL PARAMETERS			
Escherichia Coli	ct/100 mL	0	0
Faecal Coliforms	ct/100 mL	0	0
Faecal Streptococcus	ct/100 mL	0	0
Total Coliforms	ct/100 mL	0	0
CHEMICAL PARAMETERS (HEALTH	+)		
Fluoride	mg/L	0.10	0.10
N-NH3 (Ammonia)	mg/L	0.05	<0.05
N-NO2 (Nitrite)	mg/L	<0.10	<0.10
N-NO3 (Nitrate)	mg/L	0.32	<0.10
TKN	mg/L	<0.10	0.22
CHEMICAL PARAMETERS WITH AE	STHETIC OBJECTIV	ES/OPERATIONAL G	BUIDELINES
Alkalinity	mg/L	353	353
Chloride	mg/L	194	194
Colour	TCU	2	<2
Conductivity	uS/cm	1440	1450
Dissolved Organic Carbon	mg/L	2.0	1.8
pН		7.90	7.89
Phenols	mg/L	<0.001	<0.002
Sulphate	mg/L	119	111
Tannin & Lignin	mg/L	<0.10	0.40
Total Dossolved Solids	mg/L	938	942
Turbidity (lab)	NTU	76.3	0.10
Hardness	mg/L	522	534
Ion Balance		0.98	1.03
Calcium	mg/L	133	133
Magnesium	mg/L	46	49
Potassium	mg/L	5	6
Sodium	mg/L	95	103
Iron	mg/L	1.21	0.87
Manganese	mg/L	0.04	0.04

TABLE 3: Comparison of "Subdivision Package" Test Well #4 (Original and Present)

PARAMETER	UNITS	UNITS (Jan 6, 2010) 6 Hour	
MICROBIOLOGICAL PARAMETERS			
Escherichia Coli	ct/100 mL	0	0
Faecal Coliforms	ct/100 mL	0	0
Faecal Streptococcus	ct/100 mL	0	0
Total Coliforms	ct/100 mL	0	0
CHEMICAL PARAMETERS (HEALTH	1)		
Fluoride	mg/L	0.17	0.14
N-NH3 (Ammonia)		<0.02	<0.05
N-NO2 (Nitrite)	mg/L	<0.10	<0.10
N-NO3 (Nitrate)	mg/L	<0.10	<0.10
TKN		<0.10	0.23
CHEMICAL PARAMETERS WITH AE	STHETIC OBJECTIV	ES/OPERATIONAL G	UIDELINES
Alkalinity	mg/L	221	271
Chloride	mg/L	7	61
Colour	TCU	<2	2
Conductivity	uS/cm	491	774
Dissolved Organic Carbon	mg/L	1.1	1.3
рН		8.11	8.08
Phenols	mg/L	<0.001	<0.002
Sulphate	mg/L	45	66
Tannin & Lignin	mg/L	0.10	0.20
Total Dossolved Solids	mg/L	319	503
Turbidity (lab)	NTU	3.7	2.8
Hardness	mg/L	255	368
Ion Balance		0.95	0.98
Calcium	mg/L	46	75
Magnesium	mg/L	34	44
Potassium	mg/L	1	2
Na	mg/L	4	22
Fe	mg/L	0.08	0.30
Mn	mg/L	0.01	0.02

TABLE 4: Comparison of "Subdivision Package" Original Test Wells vs House Wells

	UNITS	OD	ws	TEST WELLS (1, 2A, 4 and 5)	TW2A	TW4	PW1	PW2*	PW3	PW4
PARAMETER	UNITS	TYPE	LIMIT	ORIGINAL RANGE	IWZA	1484	FWI	PVV2	PWS	F 114
MICROBIOLOGICAL PARAMETI	ERS	L		LL		1				A
Escherichia Coli	ct/100 mL	MAC	0	0 - 0	0	0	0	0	0	0
Faecal Coliforms	ct/100 mL	-	-	0 - 0	0	0	0	0	0	0
Faecal Streptococcus	ct/100 mL	-	-	0 - 0	0	0	0	0	0	0
Total Coliforms	ct/100 mL	MAC	0	0 - 0	0	0	0	0	0	0
CHEMICAL PARAMETERS (HEA	ALTH)							n territe an andra and the and the second second		General Cores and Cores and
F	mg/L	MAC	2.4	0.10 - 0.42	0.10	0.14	0.16	0.15	0.11	<0.10
N-NO2	mg/L	MAC	10	<0.10 - <0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	mg/L	MAC	10	<0.10 - 0.32	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
CHEMICAL PARAMETERS WITH	H AESTHETIC OBJE	CTIVES/OP	ERATIONAL	GUIDELINES				1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -		
Alkalinity	mg/L	OG	500	207 - 353	353	271	251	261	308	261
CI	mg/L	AO	250	6 - 205	194	61	117	26	242	144
Colour	TCU	AO	5	<2 - 7	<2	2	3	3	<2	2
DOC	mg/L	A0	5	<0.50 - 1.8	1.8	1.3	2.0	1.0	1.2	1
рН		OG	6.5-8.5	7.90 - 8.16	7.89	8.08	8.05	8.24	7.95	8.04
SO4	mg/L	AO	500	36 - 119	111	66	75	54	114	85
Hardness	mg/L	OG	100	233 - 538	534	368	404	<1	516	445
Na	mg/L	AO	200	3 - 95	103	22	46	162	111	55
Fe	mg/L	AO	0.30	0.08 - 1.21	0.87	0.30	0.66	0.05	0.46	1.07
Mn	mg/L	AO	0.10	0.01 - 0.04	0.04	0.02	0.04	<0,01	0.03	0.04
TDS	mg/L	AO	500	300 - 936	942	503	629	430	962	682
Turbidity (lab)	NTU	AO/MAC	5/1	1.1 - 76.3	0.10	2.8	4.7	1.0	4.1	12.3

* NOTE: Water sample taken was treated by a conventional Water Softner including Iron Filter

Supplemental Sampling (2024-2025) Test Wells Monitoring Wells Homeowner Wells



1-800-749-1947 www.paracellabs.com

Certificate of Analysis

This Certificate of Analysis contains analytical data applicable to the following samples as submitted: Paracel ID Client ID	
Custody: 19759	Order #. 2446476
Project: 100554.003	Order #: 2446476
Client PO: Cedar Lakes	Order Date: 14-Nov-2024
	Report Date: 21-Nov-2024
Attn: Samuel Esenwa	
Kanata, ON K2K 2A9	
32 Steacie Drive	
GEMTEC Consulting Engineers and Scientists Limited	

2446476-01 TWB

Approved By:

Mark Foto

Mark Foto, M.Sc.

Lab Supervisor



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	20-Nov-24	20-Nov-24

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL

Report Date: 21-Nov-2024

Order Date: 14-Nov-2024

Project Description: 100554.003

Order #: 2446476



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Report Date: 21-Nov-2024

Order Date: 14-Nov-2024

Project Description: 100554.003

	Client ID:	TWB	-	-	-		
	Sample Date:		-	-	-	-	-
	Sample ID:		-	-	-		
	Matrix:		-	-	-		
	MDL/Units						
Anions							•
Chloride	1 mg/L	215	-	-	-	-	-
Nitrate as N	0.1 mg/L	1.2	-	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-	-	-

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	1	mg/L					
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					

Report Date: 21-Nov-2024

Order Date: 14-Nov-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Reporting

Limit

1

0.1

0.05

Result

6.22

0.19

0.342

Client PO: Cedar Lakes

Analyte

Anions Chloride

Nitrate as N

Nitrite as N

Method Quality Control: Duplicate

Report Date: 21-Nov-2024

Order Date: 14-Nov-2024

Project Description: 100554.003

Notes

%REC

Limit

%REC

Source

Result

6.22

0.20

0.342

Units

mg/L

mg/L

mg/L

RPD

Limit

20

20

20

RPD

0.0

0.6

0.2



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions Chloride	16.6	1	mg/L	6.22	104	70-124			
Nitrate as N Nitrite as N	1.22 1.41	0.1 0.05	mg/L mg/L	0.20 0.342	102 107	77-126 82-115			

Report Date: 21-Nov-2024

Order Date: 14-Nov-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 21-Nov-2024

Order Date: 14-Nov-2024



TWB

1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Andrius Paznekas	Report Date: 27-Nov-2024
Client PO:	Order Date: 21-Nov-2024
Project: 100554.003	Ordon # 2447220
Custody: 19964	Order #: 2447328
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	
Paracel ID Client ID	

Approved By:

2447328-01

Nosa

Dale Robertson, BSc

Laboratory Director



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	21-Nov-24	21-Nov-24

Report Date: 27-Nov-2024

Order Date: 21-Nov-2024

Project Description: 100554.003

Order #: 2447328

1-800-749-1947 • www.paracellabs.com



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 27-Nov-2024

Order Date: 21-Nov-2024

	_						
	Client ID:	TWB	-	-	-		
	Sample Date:	15-Nov-24 15:30	-	-	-	-	-
	Sample ID:	2447328-01	-	-	-		
	Matrix:	Drinking Water	-	-	-		
	MDL/Units						
Anions			-				
Chloride	1 mg/L	214	-	-	-	-	-
Nitrate as N	0.1 mg/L	1.3	-	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analyte

Anions Chloride

Nitrate as N

Nitrite as N

Method Quality Control: Blank

Report Date: 27-Nov-2024

Order Date: 21-Nov-2024

Project Description: 100554.003

Notes

RPD

Limit

RPD

%REC

Limit

%REC

Reporting

Limit

1

0.1

0.05

Units

mg/L

mg/L

mg/L

Result

ND

ND

ND



Client: GEMTEC Consulting Engineers and Scientists Limited

ND

0.05

Client PO:

Nitrite as N

Method Quality Control: Duplicate

Report Date: 27-Nov-2024

Order Date: 21-Nov-2024

Project Description: 100554.003

Method Quality Control: Duplicate									
Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	219	1	mg/L	214			2.2	20	
Nitrate as N	1.37	0.1	mg/L	1.33			2.9	20	

NC

20

ND

mg/L

OTTAWA - MISSISSAUGA - HAMILTON - KINGSTON - LONDON - NIAGARA - WINDSOR - RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Report Date: 27-Nov-2024

Order Date: 21-Nov-2024

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	223	1	mg/L	214	89.3	70-124			
Nitrate as N	2.27	0.1	mg/L	1.33	94.4	77-126			
Nitrite as N	0.953	0.05	mg/L	ND	95.3	82-115			



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 27-Nov-2024

Order Date: 21-Nov-2024



1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Andrius Paznekas	Report Date: 4-Dec-2024
Client PO:	Order Date: 28-Nov-2024
Project: 100554.003	
Custody: 12099	Order #: 2448421
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	
Paracel ID Client ID	

Approved By:

2448421-01

TWB

Mark Foto

Mark Foto, M.Sc.



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis

Anions

Hardness

Turbidity

Metals, ICP-MS

Total Dissolved Solids

Analysis Summary Table

Report Date: 04-Dec-2024

Order Date: 28-Nov-2024

Analysis Date

3-Dec-24

2-Dec-24

2-Dec-24

3-Dec-24

29-Nov-24

Project Description: 100554.003

Extraction Date

3-Dec-24

29-Nov-24

29-Nov-24

2-Dec-24

29-Nov-24

Method Reference/Description

SM 2540C - gravimetric, filtration

SM 2130B - Turbidity meter

EPA 300.1 - IC

Hardness as CaCO3

EPA 200.8 - ICP-MS



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 04-Dec-2024

Order Date: 28-Nov-2024

	-				-		
	Client ID:	TWB	-	-	-		
	Sample Date:	28-Nov-24 03:00	-	-	-	-	-
	Sample ID:	2448421-01	-	-	-		
	Matrix:	Drinking Water	-	-	-		
]	MDL/Units						
General Inorganics	•						
Hardness	1 mg/L	441	-	-	-	-	-
Total Dissolved Solids	10 mg/L	900	-	-	-	-	-
Turbidity	0.1 NTU	0.6	-	-	-	-	-
Anions	•						
Chloride	1 mg/L	212	-	-	-	-	-
Nitrate as N	0.1 mg/L	1.1	-	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-	-	-
Metals							
Calcium	0.1 mg/L	114	-	-	-	-	-
Magnesium	0.2 mg/L	37.8	-	-	-	-	-
	3	00					



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	1	mg/L					
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
General Inorganics								
Total Dissolved Solids	ND	10	mg/L					
Turbidity	ND	0.1	NTU					
Metals								
Calcium	ND	0.1	mg/L					
Magnesium	ND	0.2	mg/L					

Report Date: 04-Dec-2024

Order Date: 28-Nov-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	4.86	1	mg/L	4.85			0.3	20	
Nitrate as N	0.19	0.1	mg/L	0.19			1.0	20	
Nitrite as N	ND	0.05	mg/L	ND			NC	20	
General Inorganics									
Total Dissolved Solids	70.0	10	mg/L	68.0			2.9	10	
Turbidity	0.6	0.1	NTU	0.6			0.0	10	
Metals									
Calcium	6.4	0.1	mg/L	6.3			2.0	20	
Magnesium	1.8	0.2	mg/L	1.7			4.2	20	

Report Date: 04-Dec-2024

Order Date: 28-Nov-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions		4	100 CI (1	4.05	05.0	70 404			
Chloride	14.4	1	mg/L	4.85	95.8	70-124			
Nitrate as N	1.19	0.1	mg/L	0.19	100	77-126			
Nitrite as N	0.899	0.05	mg/L	ND	89.9	82-115			
General Inorganics Total Dissolved Solids	94.0	10	mg/L	ND	94.0	75-125			
Metals									
Calcium	14200	0.1	mg/L	6290	79.0	80-120			QM-07
Magnesium	10300	0.2	mg/L	1730	85.9	80-120			

Report Date: 04-Dec-2024

Order Date: 28-Nov-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Qualifier Notes:

QC Qualifiers:

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 04-Dec-2024

Order Date: 28-Nov-2024



TWC

1-800-749-1947 www.paracellabs.com

Certificate of Analysis

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	
Custody: 19758	Older #. 2446364
Project: 100554.003	Order #: 2446364
Client PO: Cedar Lakes	Order Date: 13-Nov-2024
	Report Date: 19-Nov-2024
Attn: Samuel Esenwa	
Kanata, ON K2K 2A9	
32 Steacie Drive	
GEMTEC Consulting Engineers and Scientists Limited	

Approved By:

2446364-01

Mark Foto

Mark Foto, M.Sc.



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Analysis Anions

E. coli

Fecal Coliform

Metals, ICP-MS

Total Coliform

Turbidity

Hardness

Analysis Summary Table

Heterotrophic Plate Count

Total Dissolved Solids

Report Date: 19-Nov-2024

Order Date: 13-Nov-2024

Analysis Date

14-Nov-24

14-Nov-24

14-Nov-24

15-Nov-24

14-Nov-24

15-Nov-24

14-Nov-24

18-Nov-24

14-Nov-24

Project Description: 100554.003

Extraction Date

14-Nov-24

14-Nov-24

14-Nov-24

14-Nov-24

14-Nov-24

14-Nov-24

14-Nov-24

15-Nov-24

14-Nov-24

OTTAWA • MISS	ISSAUGA - HAMILTON	KINGSTON •	LONDON .	NIAGARA •	WINDSOR •	RICHMOND	HILL
---------------	--------------------	------------	----------	-----------	-----------	----------	------

Method Reference/Description

SM 2540C - gravimetric, filtration

SM 2130B - Turbidity meter

EPA 300.1 - IC

Hardness as CaCO3

EPA 200.8 - ICP-MS

MOE E3407

SM 9222D

SM 9215C

MOE E3407



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Report Date: 19-Nov-2024

Order Date: 13-Nov-2024

	_						
	Client ID:	TWC	-	-	-		
	Sample Date:	13-Nov-24 16:00	-	-	-	-	-
	Sample ID:	2446364-01	-	-	-		
	Matrix:	Drinking Water	-	-	-		
	MDL/Units						
Microbiological Parameters							
E. coli	1 CFU/100mL	ND	-	-	-	-	-
Total Coliforms	1 CFU/100mL	8	-	-	-	-	-
Fecal Coliforms	1 CFU/100mL	ND [1]	-	-	-	-	-
Heterotrophic Plate Count	10 CFU/mL	<10	-	-	-	-	-
General Inorganics							
Hardness	1 mg/L	408	-	-	-	-	-
Total Dissolved Solids	10 mg/L	524	-	-	-	-	-
Turbidity	0.1 NTU	1.0	-	-	-	-	-
Anions				-			
Chloride	1 mg/L	88	-	-	-	-	-
Nitrate as N	0.1 mg/L	<0.1	-	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-	-	-
Metals							
Calcium	0.1 mg/L	88.1	-	-	-	-	-
Magnesium	0.2 mg/L	45.6	-	-	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	1	mg/L					
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
General Inorganics								
Total Dissolved Solids	ND	10	mg/L					
Turbidity	ND	0.1	NTU					
Metals								
Calcium	ND	0.1	mg/L					
Magnesium	ND	0.2	mg/L					
Microbiological Parameters								
E. coli	ND	1	CFU/100mL					
Total Coliforms	ND	1	CFU/100mL					
Heterotrophic Plate Count	ND	10	CFU/mL					

Report Date: 19-Nov-2024

Order Date: 13-Nov-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Analyte

Anions Chloride

Nitrate as N

Nitrite as N

Turbidity

Magnesium

Total Coliforms

Metals Calcium

E. coli

General Inorganics Total Dissolved Solids

Microbiological Parameters

Heterotrophic Plate Count

Method Quality Control: Duplicate

Report Date: 19-Nov-2024

Order Date: 13-Nov-2024

Project Description: 100554.003

Notes

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LC	NDON = NIAGARA = WINDSOR = RICHMOND HILL
---	--

Source

Result

87.6

ND

ND

1450

ND

8.2

2.1

ND

8

ND

Units

mg/L

mg/L

mg/L

mg/L

NTU

mg/L

mg/L

CFU/100mL

CFU/100mL

CFU/mL

Reporting

Limit

1

0.1

0.05

10

0.1

0.1

0.2

1

1

10

Result

87.2

ND

ND

1480

ND

8.0

2.2

ND

7

ND

%REC

Limit

%REC

RPD

Limit

20

20

20

10

10

20

20

30

30

30

RPD

0.4

NC

NC

2.1

NC

3.4

1.8

NC

13.3

NC



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	97.4	1	mg/L	87.6	98.5	70-124			
Nitrate as N	1.04	0.1	mg/L	ND	104	77-126			
Nitrite as N	1.03	0.05	mg/L	ND	103	82-115			
General Inorganics Total Dissolved Solids	92.0	10	mg/L	ND	92.0	75-125			
Metals									
Calcium	17500	0.1	mg/L	8240	93.0	80-120			
Magnesium	11500	0.2	mg/L	2110	94.1	80-120			

Report Date: 19-Nov-2024

Order Date: 13-Nov-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Qualifier Notes:

Sample Qualifiers :

1: Subcontracted analysis - Caduceon

Applies to Samples: TWC

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL

Order #: 2446364

Report Date: 19-Nov-2024

Order Date: 13-Nov-2024



TWC-01

TWC-101

1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Andrius Paznekas	Report Date: 27-Mar-2025
Client PO:	Order Date: 25-Mar-2025
Project: 100554.003	Order #: 2513140
Custody: 17583	Older #. 2313140
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	
Paracel ID Client ID	

Approved By:

2513140-01 2513140-02

Mark Foto

Mark Foto, M.Sc.



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis Summary Table

Order	#:	2513140
Oraci	π.	2010140

Report Date: 27-Mar-2025

Order Date: 25-Mar-2025

Project Description: 100554.003

Analysis	Method Reference/Description	Extraction Date	Analysis Date
E. coli	MOE E3407	25-Mar-25	25-Mar-25
Fecal Coliform	SM 9222D	25-Mar-25	25-Mar-25
Heterotrophic Plate Count	SM 9215C	25-Mar-25	25-Mar-25
Total Coliform	MOE E3407	25-Mar-25	25-Mar-25

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 27-Mar-2025

Order Date: 25-Mar-2025

	Client ID:	TWC-01	TWC-101	-	-		
	Sample Date:	25-Mar-25 10:26	25-Mar-25 10:36	-	-	-	-
	Sample ID:	2513140-01	2513140-02	-	-		
	Matrix:	Drinking Water	Drinking Water	-	-		
	MDL/Units						
Microbiological Parameters	-						
E. coli	1 CFU/100mL	ND	ND	-	-	-	-
Total Coliforms	1 CFU/100mL	ND	ND	-	-	-	-
Fecal Coliforms	1 CFU/100mL	ND	ND	-	-	-	-
Heterotrophic Plate Count	10 CFU/mL	10	<10	-	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Blank

Report Date: 27-Mar-2025

Order Date: 25-Mar-2025

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Microbiological Parameters								
E. coli	ND	1	CFU/100mL					
Total Coliforms	ND	1	CFU/100mL					
Fecal Coliforms	ND	1	CFU/100mL					
Heterotrophic Plate Count	ND	10	CFU/mL					



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Microbiological Parameters									
E. coli	ND	1	CFU/100mL	ND			NC	30	
Total Coliforms	ND	1	CFU/100mL	ND			NC	30	
Fecal Coliforms	ND	1	CFU/100mL	ND			NC	30	
Heterotrophic Plate Count	10	10	CFU/mL	10			0.0	30	

Report Date: 27-Mar-2025

Order Date: 25-Mar-2025



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Qualifier Notes:

Sample Qualifiers :

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 27-Mar-2025

Order Date: 25-Mar-2025



1-800-749-1947 www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited		
32 Steacie Drive		
Kanata, ON K2K 2A9		
Attn: Samuel Esenwa		Report Date: 15-Nov-2024
Client PO: Cedar Lakes		Order Date: 12-Nov-2024
Project: 100554.003		Order #: 2446227
Custody: 19757	Revised Report	Order #. 2446227
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:		
Paracel ID Client ID		

2446227-01 TWE

Approved By:

Mark Froto

Mark Foto, M.Sc.



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Analysis Anions

E. coli

Fecal Coliform

Metals, ICP-MS

Total Coliform

Turbidity

Hardness

Analysis Summary Table

Heterotrophic Plate Count

Total Dissolved Solids

Report Date: 15-Nov-2024

Order Date: 12-Nov-2024

Analysis Date

13-Nov-24

13-Nov-24

13-Nov-24

15-Nov-24

13-Nov-24

15-Nov-24

13-Nov-24

14-Nov-24

14-Nov-24

Project Description: 100554.003

Extraction Date

13-Nov-24

13-Nov-24

13-Nov-24

14-Nov-24

13-Nov-24

14-Nov-24

13-Nov-24

13-Nov-24

14-Nov-24

OTTAWA + MISSISSAUGA	HAMILTON I	KINGSTON	LONDON	 NIAGARA 	 WINDSOR 	RICHMOND HILL
----------------------	-----------------	----------	--------	-----------------------------	-----------------------------	---------------

Method Reference/Description

SM 2540C - gravimetric, filtration

SM 2130B - Turbidity meter

EPA 300.1 - IC

Hardness as CaCO3

EPA 200.8 - ICP-MS

MOE E3407

SM 9222D

SM 9215C

MOE E3407



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Report Date: 15-Nov-2024

Order Date: 12-Nov-2024

-						
Client ID:	TWE	-	-	-		
Sample Date:	12-Nov-24 15:00	-	-	-	-	-
Sample ID:	2446227-01	-	-	-		
Matrix:	Drinking Water	-	-	-		
MDL/Units						
			•	•		
1 CFU/100mL	ND	-	-	-	-	-
1 CFU/100mL	ND	-	-	-	-	-
1 CFU/100mL	ND [1]	-	-	-	-	-
10 CFU/mL	<10	-	-	-	-	-
1 mg/L	357	-	-	-	-	-
10 mg/L	458	-	-	-	-	-
0.1 NTU	2.4	-	-	-	-	-
1 mg/L	88	-	-	-	-	-
0.1 mg/L	<0.1	-	-	-	-	-
0.05 mg/L	<0.05	-	-	-	-	-
0.1 mg/L	79.8	-	-	-	-	-
0.2 mg/L	38.4	-	-	-	-	-
	Sample Date: Sample ID: Matrix: MDL/Units 1 CFU/100mL 1 CFU/100mL 1 CFU/100mL 1 CFU/100mL 1 CFU/100mL 1 CFU/mL 10 CFU/mL 10 mg/L 0.1 NTU 1 mg/L 0.1 mg/L 0.05 mg/L 0.1 mg/L	Sample Date: 12-Nov-24 15:00 Sample ID: 2446227-01 Matrix: Drinking Water MDL/Units I 1 CFU/100mL ND 1 O CFU/mL <10	Sample Date: 12-Nov-24 15:00 - Sample ID: 2446227-01 - Matrix: Drinking Water - MDL/Units - 1 CFU/100mL ND - 1 0 CFU/mL <10	Sample Date: 12-Nov-24 15:00 2446227-01 Drinking Water - - Matrix: Drinking Water - - MDL/Units Drinking Water - - 1 CFU/100mL ND - - 1 CFU/100mL ND [1] - - 1 0 CFU/mL <10	Sample Date: 12-Nov-24 15:00 - </td <td>Sample Date: 12-Nov-24 15:00 -<!--</td--></td>	Sample Date: 12-Nov-24 15:00 - </td



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	1	mg/L					
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
General Inorganics								
Total Dissolved Solids	ND	10	mg/L					
Turbidity	ND	0.1	NTU					
Metals								
Calcium	ND	0.1	mg/L					
Magnesium	ND	0.2	mg/L					
Microbiological Parameters								
E. coli	ND	1	CFU/100mL					
Total Coliforms	ND	1	CFU/100mL					
Heterotrophic Plate Count	ND	10	CFU/mL					

Report Date: 15-Nov-2024

Order Date: 12-Nov-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Analyte

Anions Chloride

Nitrate as N

Nitrite as N

Turbidity

Magnesium

Total Coliforms

Metals Calcium

E. coli

General Inorganics Total Dissolved Solids

Microbiological Parameters

Heterotrophic Plate Count

Method Quality Control: Duplicate

Report Date: 15-Nov-2024

Order Date: 12-Nov-2024

Project Description: 100554.003

Notes

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HIL	OTTAWA + MISSISSAUG	 HAMILTON 	KINGSTON	 LONDON 	 NIAGARA 	 WINDSOR 	 RICHMOND 	HILL
--	---------------------	------------------------------	----------	----------------------------	-----------------------------	-----------------------------	------------------------------	------

Source

Result

88.3

ND

ND

88.0

ND

8.2

2.1

ND

ND

ND

Units

mg/L

mg/L

mg/L

mg/L

NTU

mg/L

mg/L

CFU/100mL

CFU/100mL

CFU/mL

Reporting

Limit

1

0.1

0.05

10

0.1

0.1

0.2

1

1

10

Result

89.3

ND

ND

90.0

ND

8.0

2.2

ND

ND

ND

%REC

Limit

%REC

RPD

Limit

20

20

20

10

10

20

20

30

30

30

RPD

1.1

NC

NC

2.3

NC

3.4

1.8

NC

NC

NC



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	98.5	1	mg/L	88.3	102	70-124			
Nitrate as N	1.08	0.1	mg/L	ND	108	77-126			
Nitrite as N	1.07	0.05	mg/L	ND	107	82-115			
General Inorganics Total Dissolved Solids	100	10	mg/L	ND	100	75-125			
Metals									
Calcium	17500	0.1	mg/L	8240	93.0	80-120			
Magnesium	11500	0.2	mg/L	2110	94.1	80-120			

Report Date: 15-Nov-2024

Order Date: 12-Nov-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Qualifier Notes:

Sample Qualifiers :

1: Subcontracted analysis - Caduceon Applies to Samples: TWE

Sample Data Revisions:

None

Work Order Revisions / Comments:

Revision 1 - This report includes an additional Fecal Coliform qualifier identifying that the analysis was subcontracted.

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 15-Nov-2024

Order Date: 12-Nov-2024

Project Description: 100554.003

Order #: 2446227



GEMTEC Con 32 Steacie Driv	e	
Kanata, ON K2	K 2A9	
Attn: Jason Kar	is-Allen	Report Date: 26-Jun-2024
Client PO:		Order Date: 20-Jun-2024
Project: 100554.0)03	Order #: 2425424
Custody: 1992	22	Order #. 2423424
This Certificate of submitted:	of Analysis contains analytical data applicable to the following samples as	
Paracel ID	Client ID	
2425424-01	MW-1	
2425424-02	MW-2	
2425424-03	MW-3	

Approved By:

Vasa

Dale Robertson, BSc

Laboratory Director



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis Summary Table

Report Date: 26-Jun-2024

Order Date: 20-Jun-2024

Project Description: 100554.003

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Ammonia, as N	EPA 351.2 - Auto Colour	24-Jun-24	24-Jun-24
Anions	EPA 300.1 - IC	24-Jun-24	24-Jun-24
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	21-Jun-24	25-Jun-24

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 26-Jun-2024

Order Date: 20-Jun-2024

	Client ID: Sample Date: Sample ID: Matrix:	MW-1 20-Jun-24 10:45 2425424-01 Ground Water	MW-2 20-Jun-24 10:00 2425424-02 Ground Water	MW-3 20-Jun-24 09:15 2425424-03 Ground Water		-	-
	MDL/Units						
General Inorganics							
Ammonia as N	0.01 mg/L	0.02	0.16	0.04	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.7	3.0	1.0	-	-	-
Anions					-		
Nitrate as N	0.1 mg/L	2.8	<0.1	<0.1	-	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
General Inorganics								
Ammonia as N	ND	0.01	mg/L					
Total Kjeldahl Nitrogen	ND	0.1	mg/L					

Report Date: 26-Jun-2024

Order Date: 20-Jun-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Nitrate as N	0.78	0.1	mg/L	0.76			2.2	20	
Nitrite as N	ND	0.05	mg/L	ND			NC	20	
General Inorganics									
Ammonia as N	0.038	0.01	mg/L	0.038			0.5	18	
Total Kjeldahl Nitrogen	1.71	0.1	mg/L	1.74			2.0	16	

Report Date: 26-Jun-2024

Order Date: 20-Jun-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Nitrate as N	1.80	0.1	mg/L	0.76	104	77-126			
Nitrite as N	0.987	0.05	mg/L	ND	98.7	82-115			
General Inorganics									
Ammonia as N	1.03	0.01	mg/L	0.038	99.6	81-124			
Total Kjeldahl Nitrogen	2.70	0.1	mg/L	1.74	95.3	81-126			

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL

Report Date: 26-Jun-2024

Order Date: 20-Jun-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Order #: 2425424

Report Date: 26-Jun-2024

Order Date: 20-Jun-2024

Project Description: 100554.003

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



. . ..

Certificate of Analysis

	Oldel #. 2440470
Project: 100554.003	Order #: 2446478
Client PO: Cedar Lakes	Order Date: 14-Nov-2024
	Report Date: 19-Nov-2024
Attn: Samuel Esenwa	
Kanata, ON K2K 2A9	
32 Steacie Drive	

 Paracel ID
 Client ID

 2446478-01
 MW1

 2446478-02
 MW2

 2446478-03
 MW3

Approved By:

Mark Foto

Mark Foto, M.Sc.

Lab Supervisor



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Analysis Summary Table

Report Date: 19-Nov-2024

Order Date: 14-Nov-2024

Project Description: 100554.003

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Ammonia, as N	EPA 351.2 - Auto Colour	15-Nov-24	15-Nov-24
Anions	EPA 300.1 - IC	15-Nov-24	15-Nov-24
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	15-Nov-24	18-Nov-24

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Report Date: 19-Nov-2024

Order Date: 14-Nov-2024

Project Description: 100554.003

	Client ID:	MW1	MW2	MW3	-		
	Sample Date:	14-Nov-24 14:00	14-Nov-24 12:00	14-Nov-24 13:00	-	-	-
	Sample ID:	2446478-01	2446478-02	2446478-03	-		
	Matrix:	Ground Water	Ground Water	Ground Water	-		
	MDL/Units						
General Inorganics							
Ammonia as N	0.01 mg/L	0.03	0.11	0.01	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.5	1.6	0.5	-	-	-
Anions							
Nitrate as N	0.1 mg/L	3.5	<0.1	<0.1	-	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	-	-	-



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
General Inorganics								
Ammonia as N	ND	0.01	mg/L					
Total Kjeldahl Nitrogen	ND	0.1	mg/L					

Report Date: 19-Nov-2024

Order Date: 14-Nov-2024



Client: GEMTEC Consulting Engineers and Scientists Limited

Reporting

Limit

0.1

0.05

0.01

0.1

Result

11.5

0.060

0.015

ND

Client PO: Cedar Lakes

General Inorganics Ammonia as N

Total Kjeldahl Nitrogen

Analyte

Anions Nitrate as N

Nitrite as N

Method Quality Control: Duplicate

Report Date: 19-Nov-2024

Order Date: 14-Nov-2024

Project Description: 100554.003

Notes

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LO	NDON - NIAGARA - WINDSOR - RICHMOND HILL
---	--

Source

Result

11.5

0.058

0.014

ND

Units

mg/L

mg/L

mg/L

mg/L

%REC

Limit

%REC

RPD

Limit

20

20

18

16

RPD

0.0

2.2

10.6

NC



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Nitrate as N	12.4	0.1	mg/L	11.5	89.5	77-126			
Nitrite as N	1.04	0.05	mg/L	0.058	97.9	82-115			
General Inorganics									
Ammonia as N	1.02	0.01	mg/L	0.014	101	81-124			
Total Kjeldahl Nitrogen	1.08	0.1	mg/L	ND	108	81-126			

Report Date: 19-Nov-2024

Order Date: 14-Nov-2024

Project Description: 100554.003



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO: Cedar Lakes

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 19-Nov-2024

Order Date: 14-Nov-2024

Project Description: 100554.003



1700 Cedarlakes

1738 Cedarlakes

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited	
32 Steacie Drive	
Kanata, ON K2K 2A9	
Attn: Andrius Paznekas	Report Date: 26-Mar-2025
Client PO:	Order Date: 24-Mar-2025
Project: 100554.003	Order #: 2513084
Custody: 18900	Order #. 2515004
This Certificate of Analysis contains analytical data applicable to the following samples as submitted:	
Paracel ID Client ID	

Approved By:

2513084-01

2513084-02

Mark Foto

Mark Foto, M.Sc.



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	25-Mar-25	25-Mar-25

Report Date: 26-Mar-2025

Order Date: 24-Mar-2025

Project Description: 100554.003

Order #: 2513084



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Anions Chloride Nitrate as N Report Date: 26-Mar-2025

Order Date: 24-Mar-2025

Project Description: 100554.003

_						
Client ID:	1700 Cedarlakes	1738 Cedarlakes	-	-		
Sample Date:	24-Mar-25 10:00	24-Mar-25 10:30	-	-	-	-
Sample ID:	2513084-01	2513084-02	-	-		
Matrix:	Drinking Water	Drinking Water	-	-		
MDL/Units						
1 mg/L	235	242	-	-	-	-
0.1 mg/L	1.9	<0.1	-	-	-	-

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analyte

Anions Chloride

Nitrate as N

Method Quality Control: Blank

Report Date: 26-Mar-2025

Order Date: 24-Mar-2025

Project Description: 100554.003

Notes

RPD

Limit

RPD

%REC

Limit

%REC

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL

Reporting

Limit

1

0.1

Units

mg/L

mg/L

Result

ND

ND



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Analyte

Anions Chloride

Nitrate as N

Method Quality Control: Duplicate

Report Date: 26-Mar-2025

Order Date: 24-Mar-2025

Project Description: 100554.003

Notes

Source

Result

242

ND

Units

mg/L

mg/L

Reporting

Limit

1

0.1

Result

245

ND

%REC

Limit

%REC

RPD

Limit

20

20

RPD

1.3

NC



Client: GEMTEC Consulting Engineers and Scientists Limited

Reporting

Limit

1

0.1

Result

252

0.97

Client PO:

Analyte

Anions

Chloride

Nitrate as N

Method Quality Control: Spike

Notes

RPD

Limit

RPD

%REC

Limit

70-124

77-126

Report Date: 26-Mar-2025

Order Date: 24-Mar-2025

Project Description: 100554.003

%REC

100

97.2

Source

Result

242

ND

Units

mg/L

mg/L

OTTAWA • MISSISSAUGA • HAMILTON • KINGSTON • LONDON • NIAGARA • WINDSOR • RICHMOND HILL



Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Qualifier Notes:

Login Qualifiers :

Container(s) - Labeled improperly/insufficient information - Containers missing the sample collection time; chain of custody reads AM; client confirmed collection time as 10:00. Applies to Samples: 1700 Cedarlakes Container(s) - Labeled improperly/insufficient information - Containers missing the sample collection time; chain of custody reads AM; client confirmed collection time as 10:30. Applies to Samples: 1738 Cedarlakes

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Report Date: 26-Mar-2025

Order Date: 24-Mar-2025

Project Description: 100554.003

Order #: 2513084

APPENDIX E

Nitrate Dilution Calculations

Nitrate Dilution Calculation Worksheet - Cedar Lakes Phase 3-4

Nitrate Loading

Residential Septic Systems (assumes 1,000 L/day/lot) Number of lots with untreated septic systems = Nitrate loading from untreated septic system = Total annual nitrate loading from untreated systems =	40	lots grams/lot/day grams/year
Total Annual Nitrate Loading from all Systems =	1,036,600	grams/year
Dilution Volumes		
Infiltration Factors		
Topography factor =	0.2	
Soil factor =	0.4	
Cover factor =	0.165	
Combined infiltration factor =	0.765	
Precipitation Infiltration		
Annual water surplus =	0.380	metres/year
Annual infiltration (Water Surplus x Infiltration Factor) =	0.291	metres/year
Infiltration Area and Infiltration Volumes		
Area available for infiltration (Site Area - Hard Surface Area) = Assumes 7 metre wide x 2,300 m long interal roadways, 300m2 for each lot house+driveway and removal of lands previously incorporated into dilution assessments (Cedar Lakes Phases 1-2)	270,885	square metres
Total Annual Volume of Infiltration (Infiltration x Area) =	78,746	cubic metres/year
Annual Flow from Residential Lots (assuming 1000 L/day/lot) =	25,915	cubic metres/year
Total Annual Volume Available for Dilution =	104,661	cubic metres/year

Dilution Calculation

$C_{Nitrate} = \frac{Mass}{Volume} =$	Annual Nitrate Loading(gram Annual Dilution Volume(cubic m		=	$=\frac{mg}{L}$
C _{Nitrate} =	1036600 grams/year 104661 cubic metres/year	=	9.90	mg/L

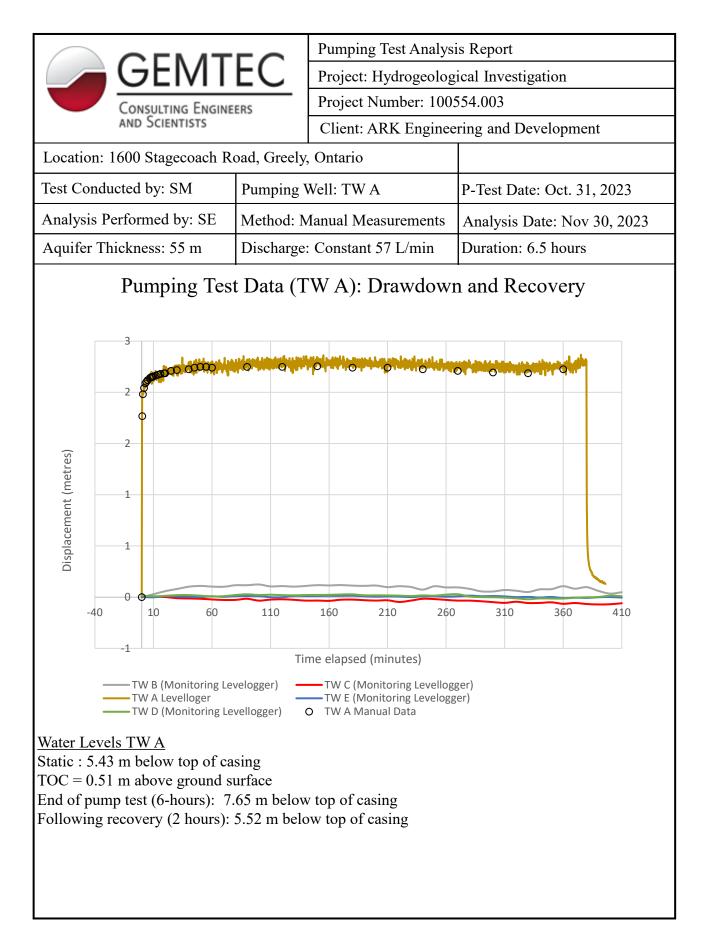


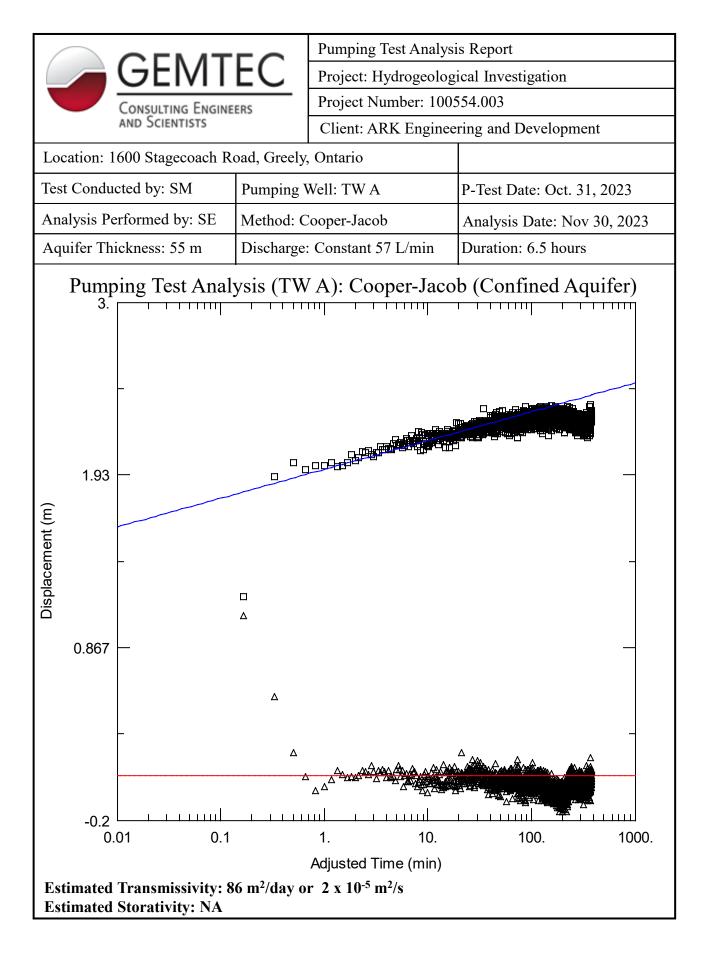
Ottawa	Intl A		WATE	R BUDG	ET MEA	ANS FOR	R THE P	ERIOD	1939-2	020	DC20492
	45.32 G 75.67		TER HO WER ZO				75 MM 45 MM	_	AT IND		
DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-10.6	62	12	14	0	0	0	25	83	74	295
28- 2	-9.0	56	10	17	1	1	0	26	112	74	351
31- 3	-2.8	66	31	78	5	5	0	103	69	75	416
30-4	5.7	73	68	74	31	31	0	111	0	75	490
31- 5	13.1	76	76	0	80	80	0	14	0	56	566
30- 6	18.3	85	85	0	116	107	-9	5	0	30	651
31- 7	20.9	88	88	0	136	103	-33	3	0	11	739
31- 8	19.6	84	84	0	118	84	-34	1	0	11	823
30- 9	14.8	82	82	0	75	65	-10	4	0	24	906
31-10	8.3	77	77	0	37	36	-1	14	0	52	77
30-11	1.3	76	59	8	10	10	0	38	9	71	154
31-12	-6.9	79	27	14	1	1	0	36	47	74	233
AVE	6.0 TTL	904	699	205	610	523	-87	380			

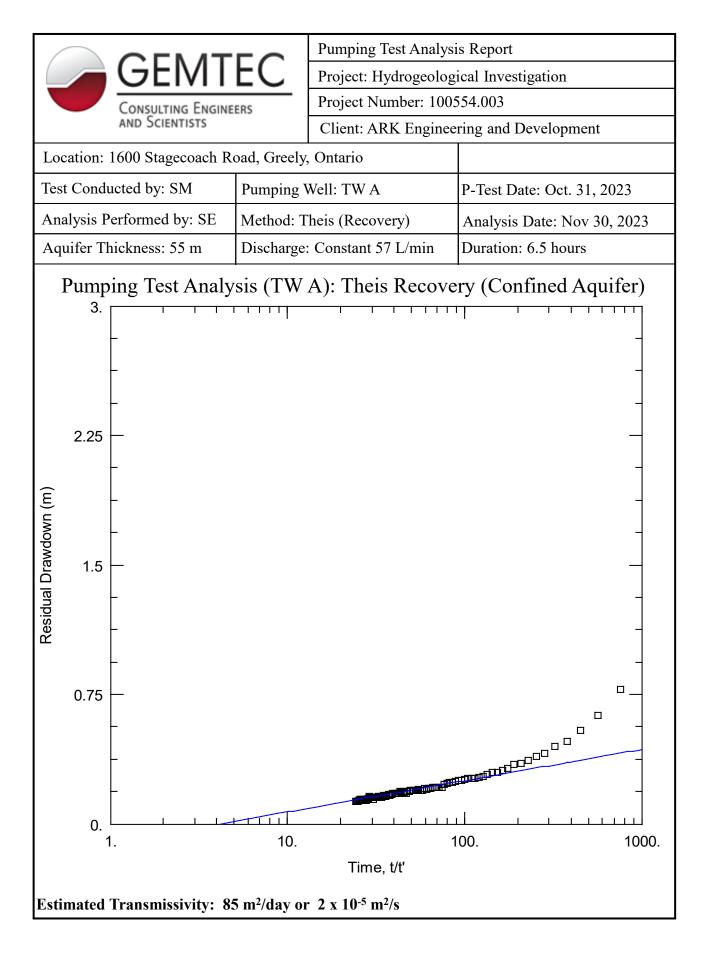
Ottawa	Intl A		STAN	DARD [DEVIATI	ONS FO	OR THE	PERIOD	1939-	2020	DC20492
DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	2.9	26	15	17	1	1	0	29	44	3	59
28- 2	2.6	26	14	26	1	1	0	35	59	3	63
31- 3	2.6	28	22	49	5	5	0	55	87	0	71
30- 4	1.8	32	33	88	9	9	0	89	2	2	80
31- 5	1.8	34	34	2	12	12	0	24	0	22	94
30- 6	1.2	38	38	0	8	18	18	16	0	29	105
31- 7	1.2	45	45	0	8	31	33	16	0	22	117
31- 8	1.3	37	37	0	8	29	31	4	0	21	126
30- 9	1.5	39	39	0	8	16	16	15	0	29	132
31-10	1.5	37	37	1	7	7	2	21	0	27	37
30-11	1.8	27	27	8	4	4	0	32	13	12	45
31-12	3.0	30	22	14	1	1	0	30	34	4	55

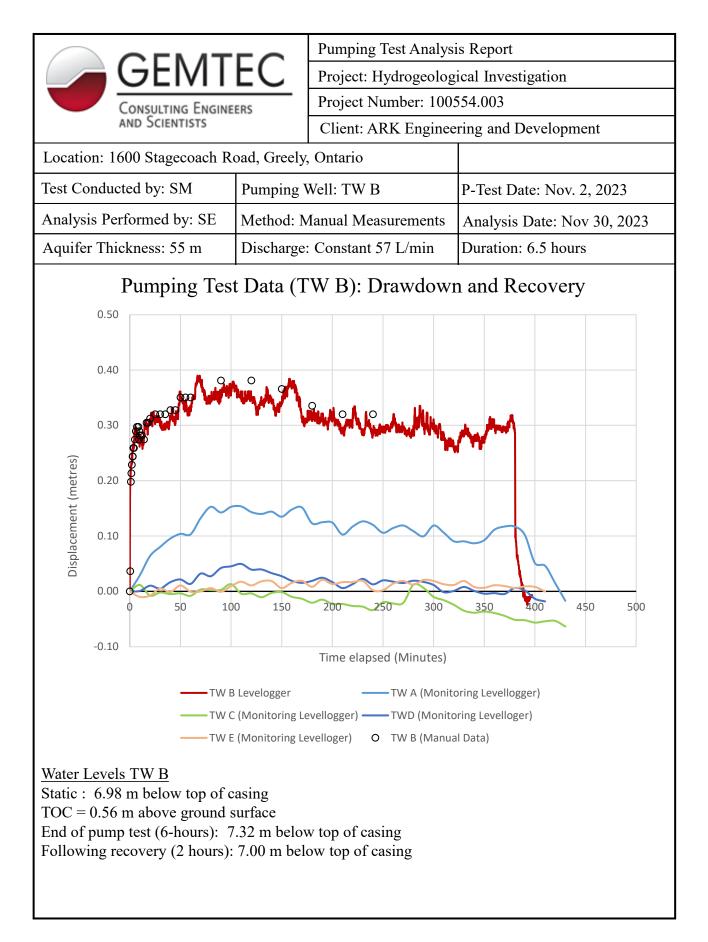
APPENDIX F

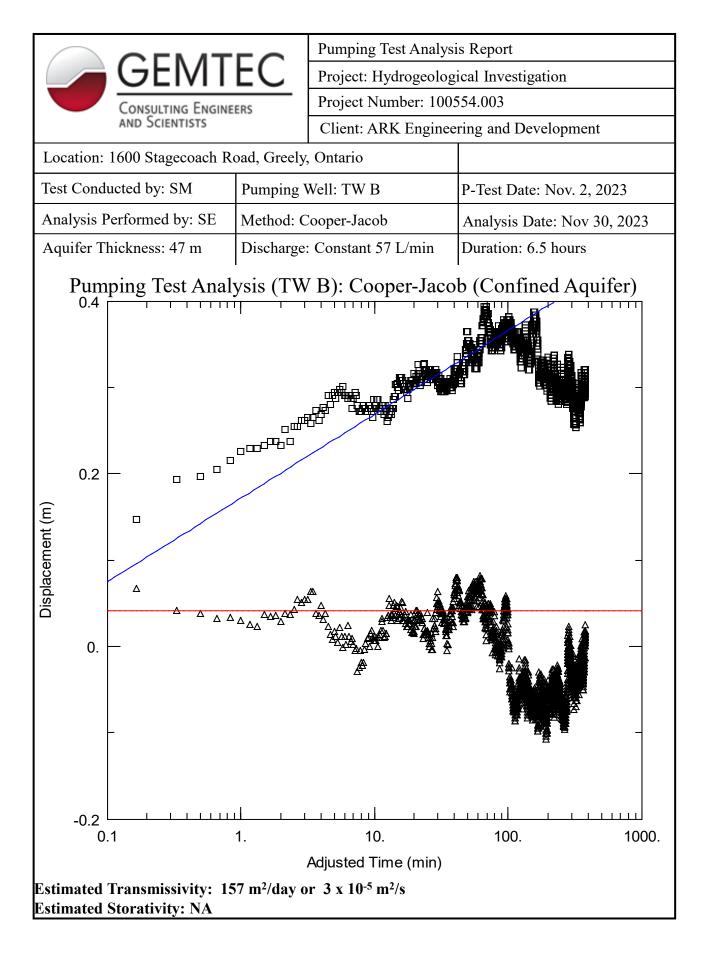
Pumping Test Graphs and Analysis

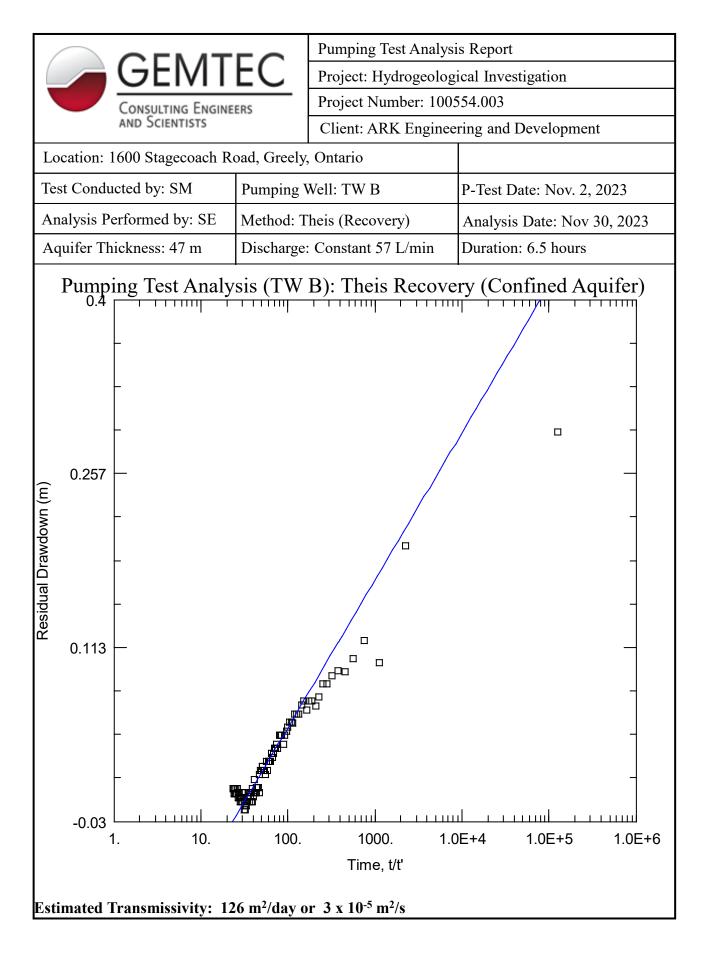


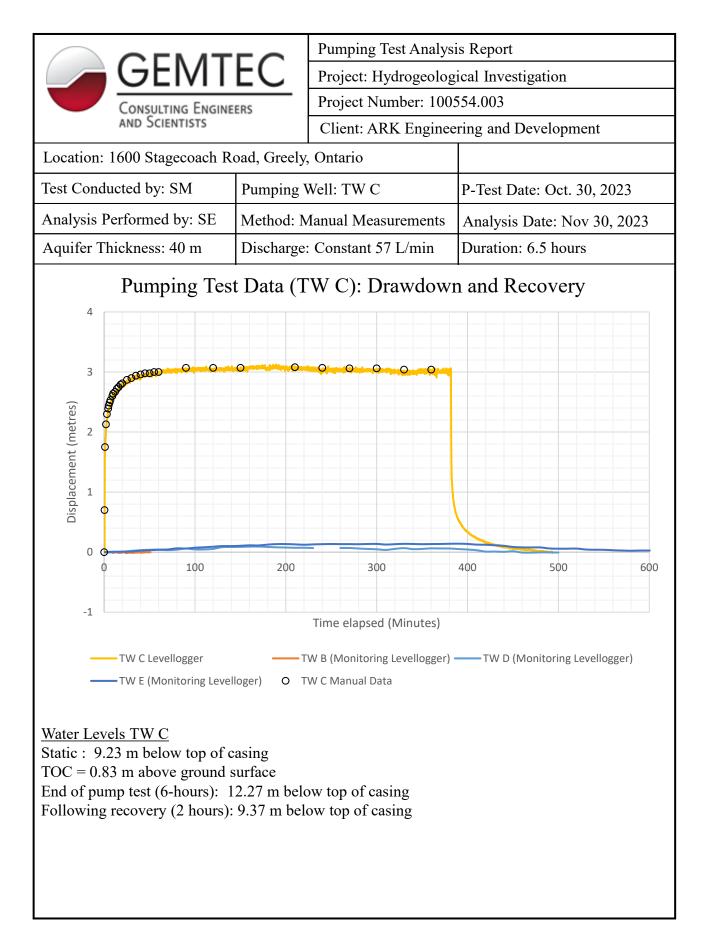


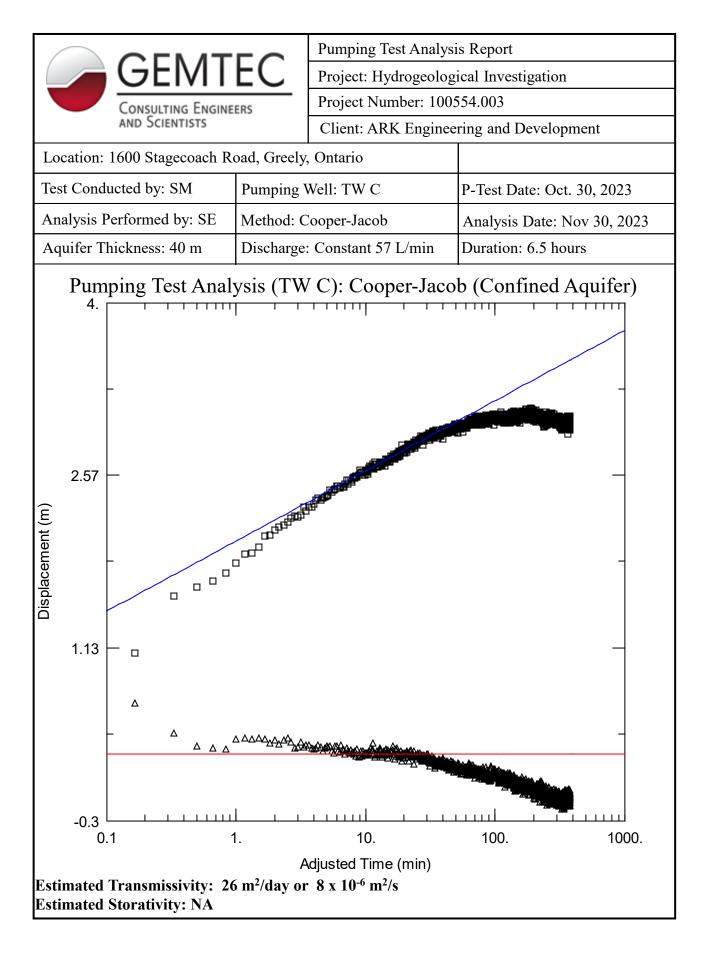


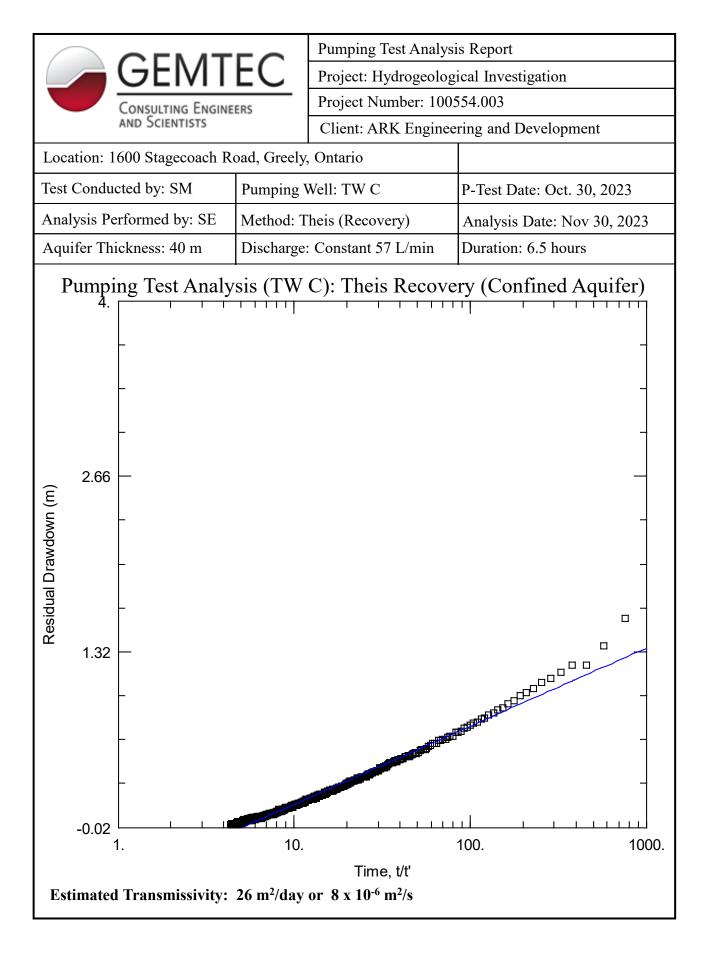


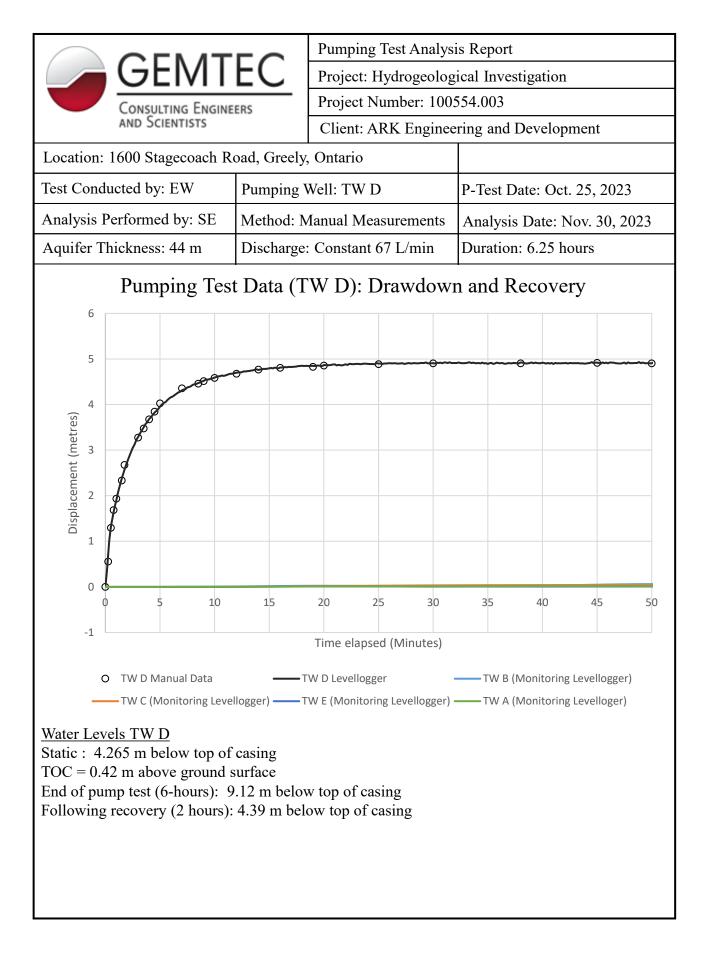


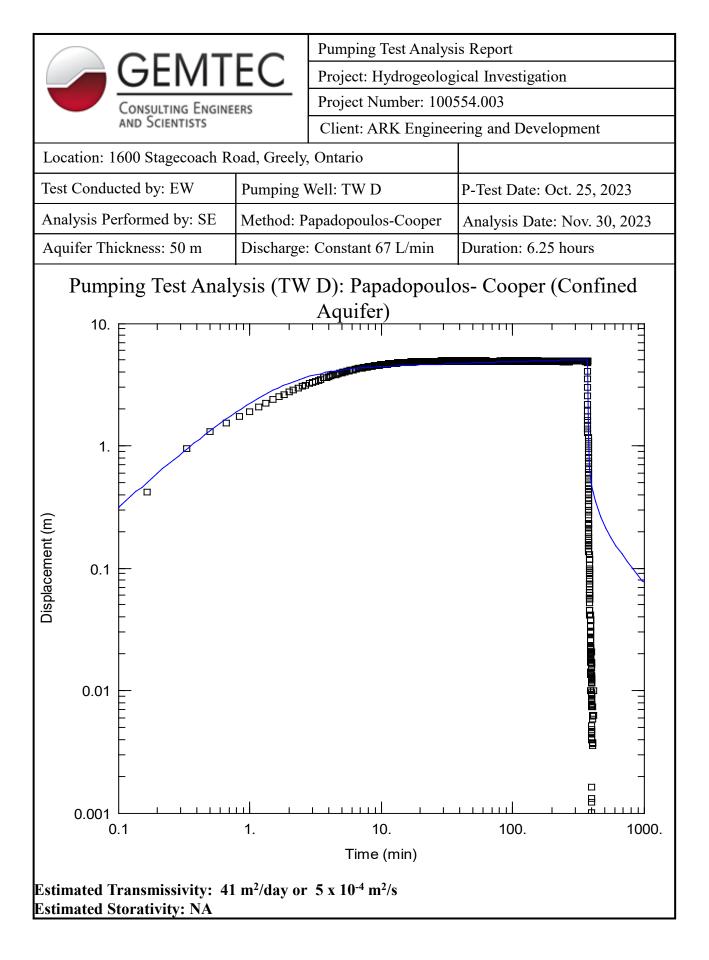


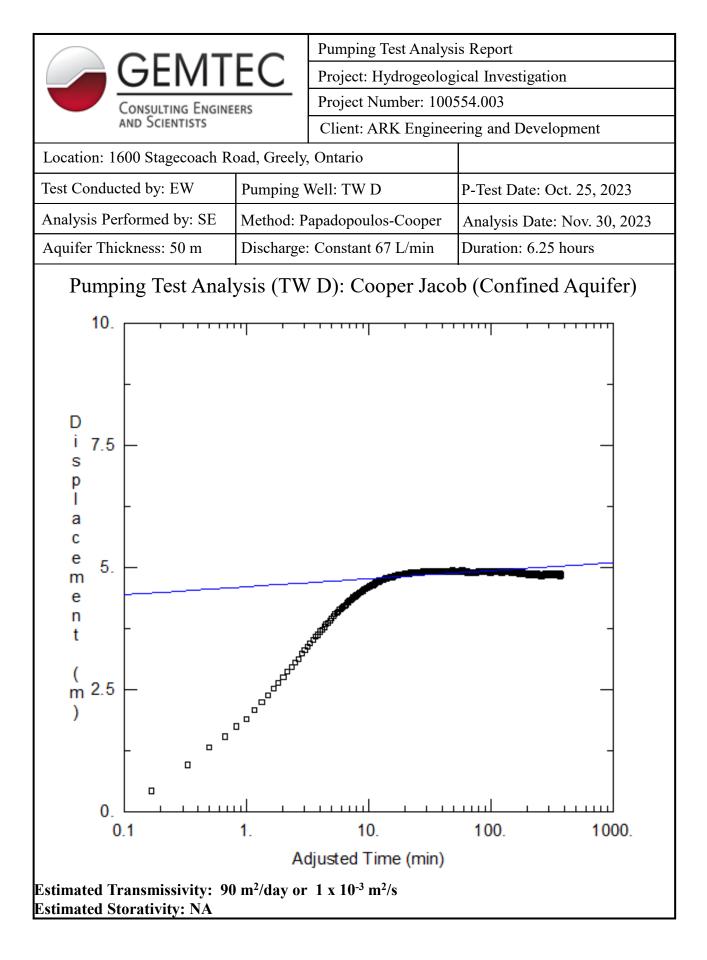


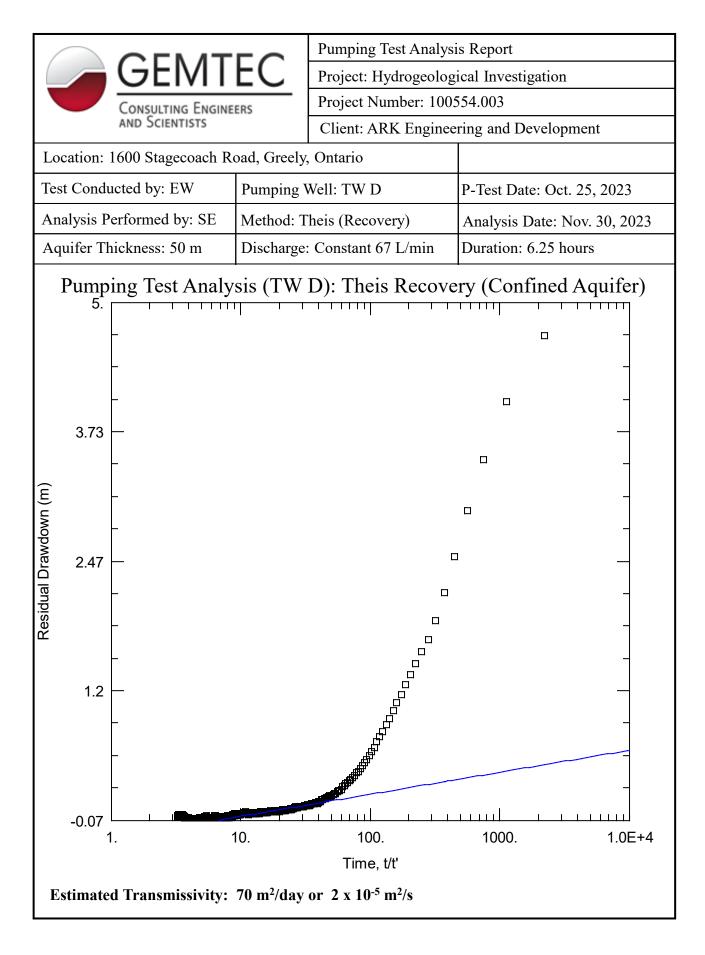


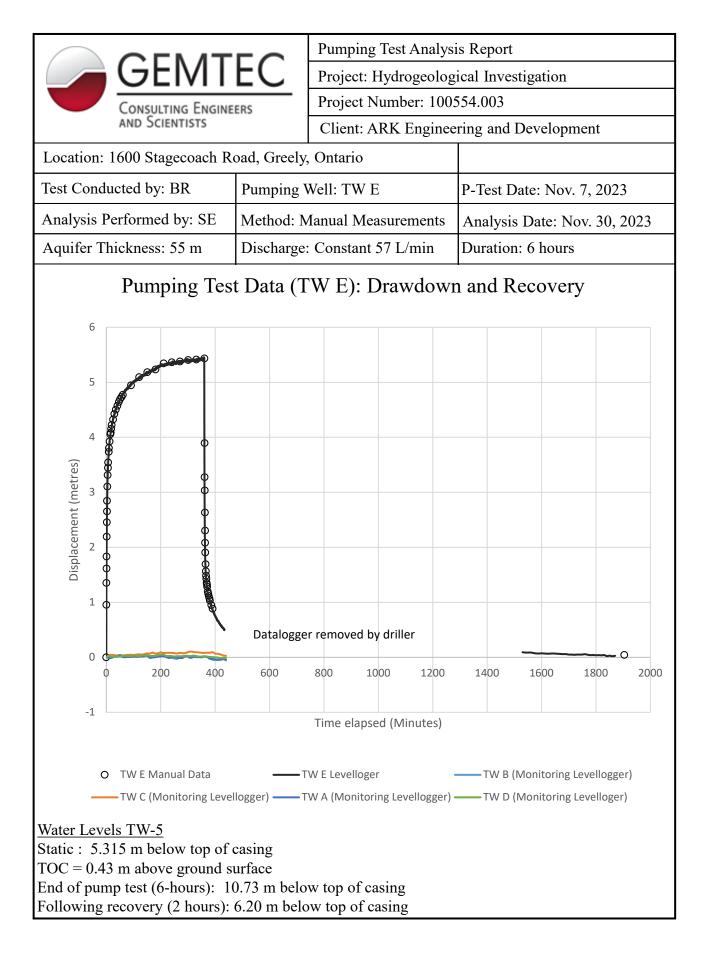


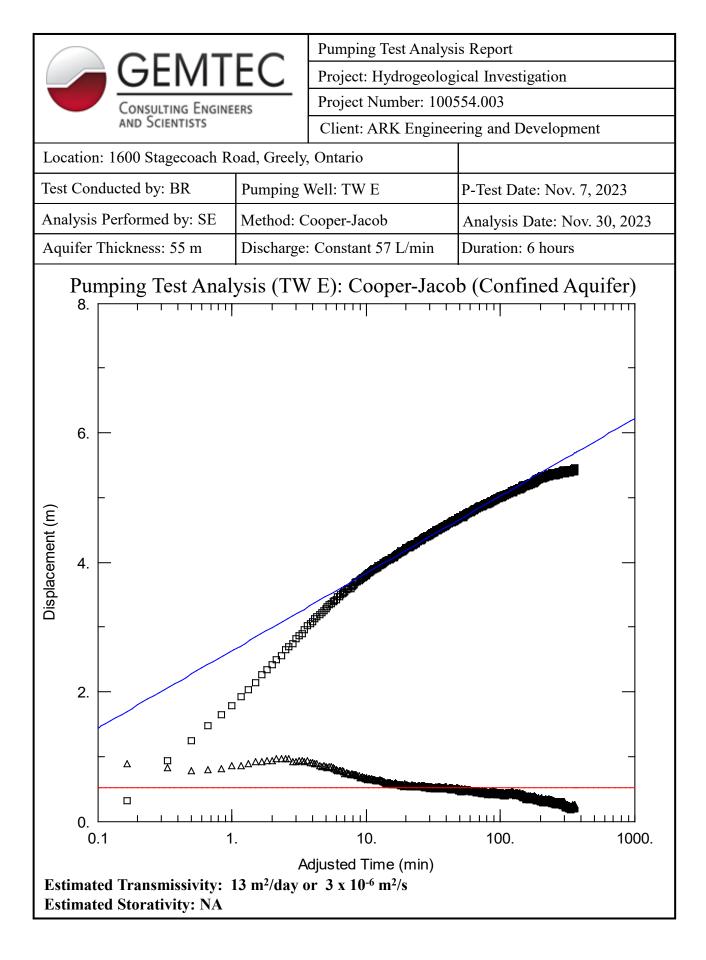


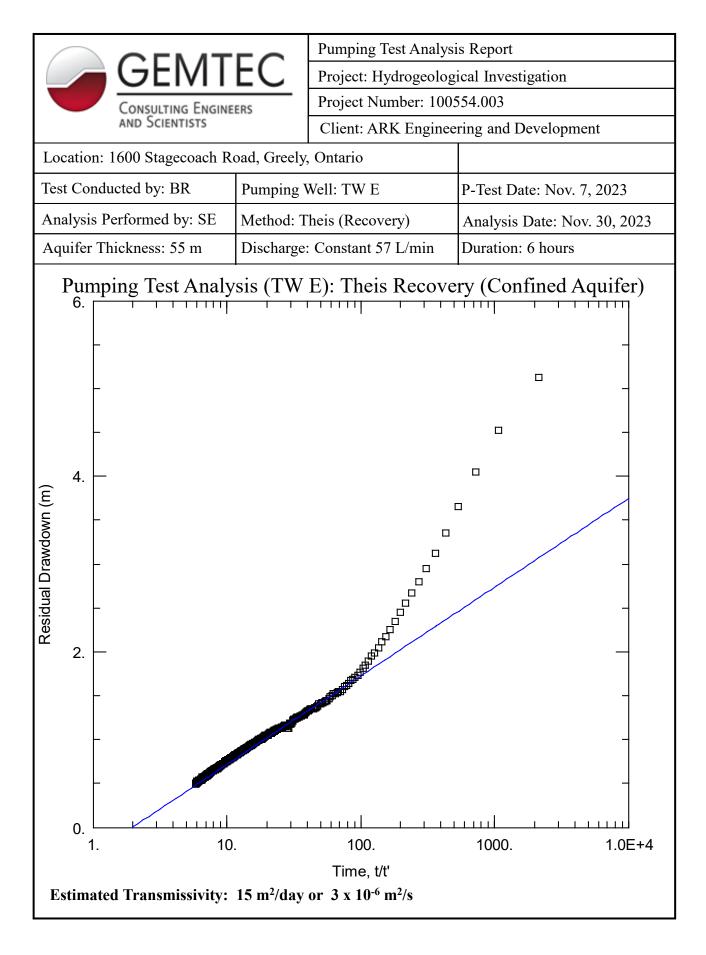






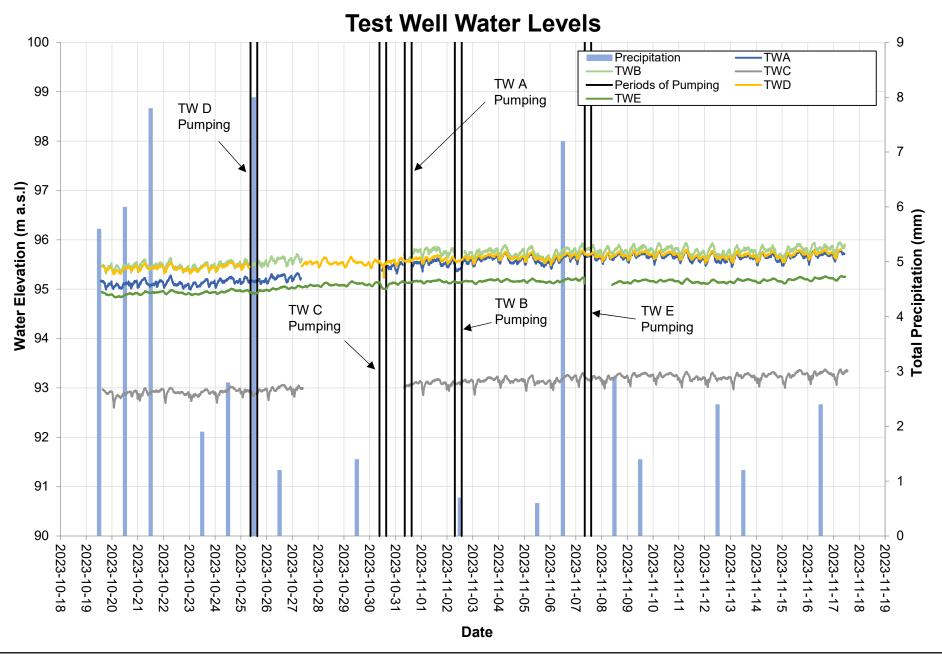






APPENDIX G

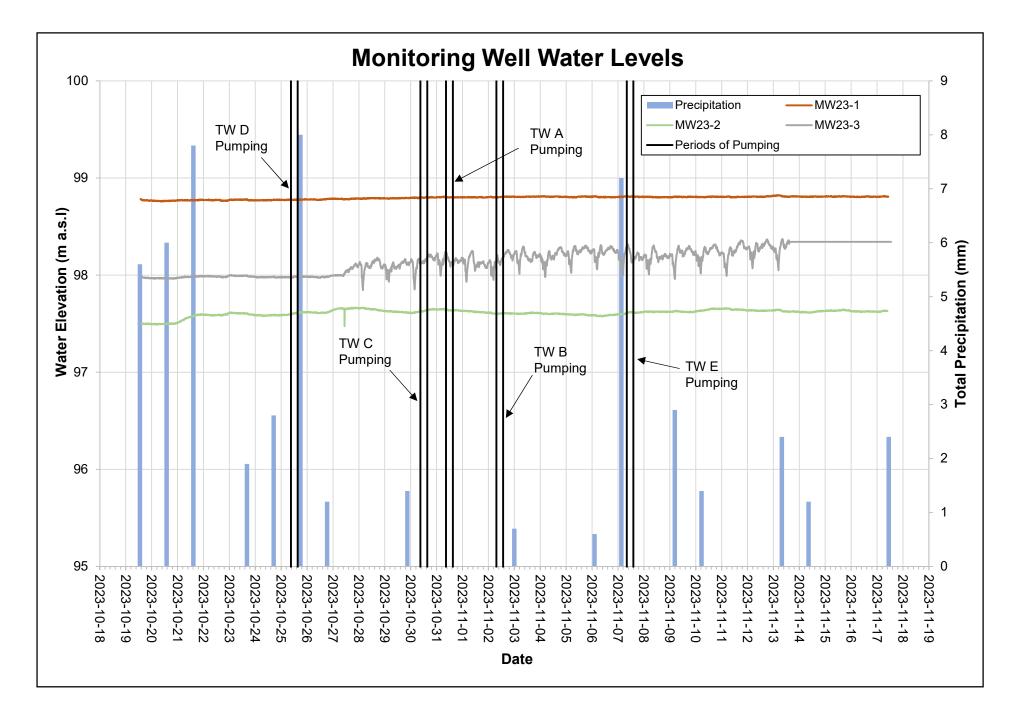
Long-Term Water Level Monitoring Graphs



Note: Gaps in time series represent period in which monitoring loggers were removed from wells to accommodate for pumping tests and/or sampling.

Project: 100554.003 Date: March 2025



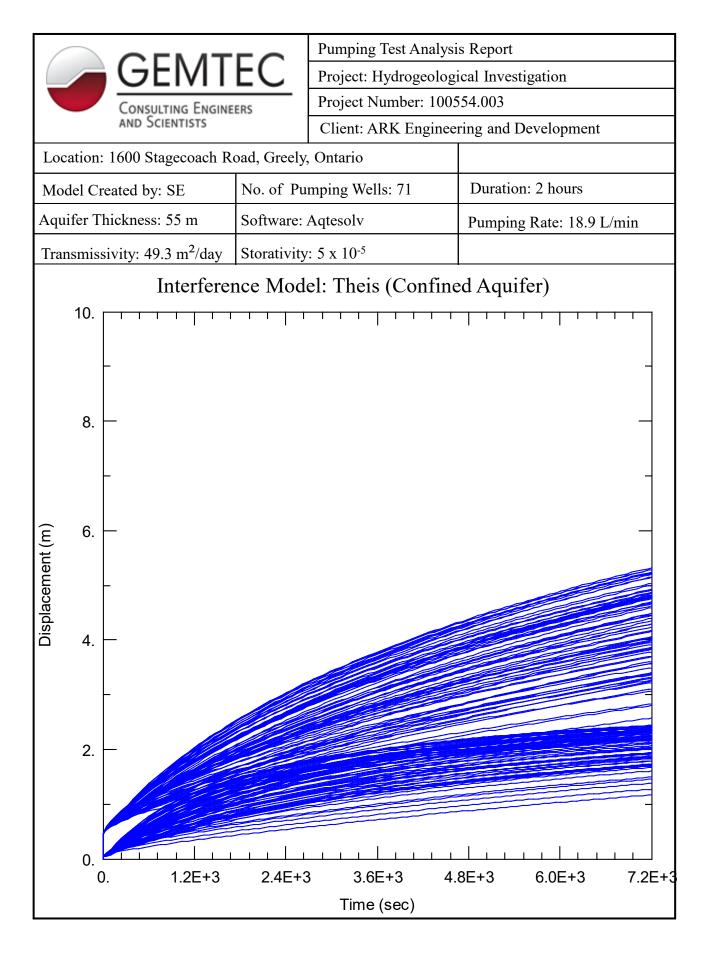


Project: 100554.003 Date: March 2025



APPENDIX H

Well Interference Simulation



APPENDIX I

LSI Calculations

Langelier Saturation Index Calculation

Project: 100554.003 Location: 1600 Stagecoach Road Sample ID: TW B - 6hr

Inputs

pH =	7.9	
Total Dissolved Solids =	900	
Calcium (as CaCO ₃) =	120	Note: Ca (as CaCO3) = 2.5 x Ca
Alkalinity (as CaCO ₃) =	352	
Temperature (°C) =	10	Assumed average groundwater temperature

Where Langelier Saturation Index (LSI) is defined as: $LSI = pH - pH_s$

Where:
$$pH_s = (9.3 + A + B) - (C + D)$$

And: $A = \frac{(\log_{10}[TDS] - 1)}{10}$
 $B = -13.12 \cdot \log_{10}[Temp + 273] + 34.55$
 $C = \log_{10}[Calcium] - 0.4$
 $D = \log_{10}[Alkalinity]$

Output:

LSI =	0.25
pH _s =	7.65
D =	2.55
C =	1.68
В =	2.38
A =	0.20

LSI Value	Indication
-2.0 to -0.5	Serious corrosion
-0.5 to 0.0	Slight corrosion but non-scale forming
LSI = 0	Balanced but corrosion possible
0.0 to 0.5	Slightly scale forming and corrosive
0.5 to 2	Scale forming but non corrosive



100554.003 December 2023

Langelier Saturation Index Calculation

Project: 100554.003 Location: 1600 Stagecoach Road Sample ID: TW D - 6hr

Inputs

pH =	8	
Total Dissolved Solids =	588	
Calcium (as CaCO ₃) =	84.9	Note: Ca (as CaCO3) = 2.5 x Ca
Alkalinity (as CaCO ₃) =	268	
Temperature (°C) =	10	Assumed average groundwater temperature

Where Langelier Saturation Index (LSI) is defined as: $LSI = pH - pH_s$

Where:
$$pH_s = (9.3 + A + B) - (C + D)$$

And: $A = \frac{(\log_{10}[TDS] - 1)}{10}$
 $B = -13.12 \cdot \log_{10}[Temp + 273] + 34.55$
 $C = \log_{10}[Calcium] - 0.4$
 $D = \log_{10}[Alkalinity]$

Output:

LSI =	0.10
pH _s =	7.90
D =	2.43
C =	1.53
В =	2.38
A =	0.18

LSI Value	Indication
-2.0 to -0.5	Serious corrosion
-0.5 to 0.0	Slight corrosion but non-scale forming
LSI = 0	Balanced but corrosion possible
0.0 to 0.5	Slightly scale forming and corrosive
0.5 to 2	Scale forming but non corrosive



100554.003 December 2023

APPENDIX J

Pre-Consultation Summary

Work Plan Review



Subject: Work Plan Review for Proposed Hydrogeological and Terrain Analysis, Proposed Residential Subdivision, Cedar Lakes Phases 3-6, 1600 Stagecoach Road, Ottawa (Greely), Ontario, prepared by GEMTEC, August 1, 2023.

Date: September 12, 2023

Reviewed Background Reports:

- Paterson Group, April 1, 2011, Terrain Analysis and Hydrogeological Study, Proposed Residential Subdivision, Part of Lot 8, Concession 3, Geographic Township of Osgoode, Ottawa (Greely), Ontario
- South Nation Conservation, December 16, 2015, Re: Hydrogeological Study Performance Report("Report"), Proposed Phase 2 Development, Cedar Lakes Subdivision, Ottawa (Greely), Ontario, Prepared by Patterson Group Inc., September 4, 2015 and Cedar Lakes Subdivision – Hydrogeological Study Performance Report, Response to SNC comments ("Response Letter"), Prepared by ARK Engineering and Development, November 13, 2015.
- Ontario Municipal Board, June 17, 2016, Case NO(S) PL101449, PL140495

Attendees

Jeffrey Ostafichuk (JO)	City of Ottawa
Kevin Hall	City of Ottawa
Andrius Paznekas (AP)	GEMTEC
Daniel Payer	ARK Engineering
Rob Kell (RK)	Dillon
Angella Graham (AG)	Dillon
Matt McCurdy (MM)	Dillon
Minoo Yazdanpanah (MY)	Dillon

Notes

Item	Discussion
	Introduction of Attendees
	Hydrogeological Investigation
1.	Five drilled groundwater test wells will be utilized for the hydrogeological investigation (to satisfy the Ministry of the Environment, Conservation and Parks (MECP) Procedure D-5-5 requirements for sites up to 40 hectares). The test wells include three existing wells (TW-A, TW-B, and TW-C), and two proposed test wells (TW-D and TW-E). It should be noted that these test wells have been renamed to avoid confusion with other wells in the area.
	 TW-A and TW-C are existing from previous investigations. These two wells do not have 40 m of the well casings; however, sleeves will be installed to 40 m to meet the targeted casing depth. TW-B is installed in the City's Park and has a 40-meter casing.
	• TW-D and TW-E are proposed wells that will be drilled and cased to 40 m depth as
	part of this study. Test well construction will be supervised and documented by

Item	Discussion
	 GEMITEC field staff, which will include lithological logging, test well construction, well grout inspection, and well chlorination. TW-A and TW-C will be chlorinated during extension. TW-B will be chlorinated 24-48 hours before the pump test. Residual chlorine levels will be monitored before water quality sample collection. The integrity of each existing test well will be assessed before use and replacement / new wells used, if necessary. Test wells will be adequately distributed across the area for proper characterization and analysis.
2.	As noted above, the TW-A and TW-C casing will be extended to 40 metres with 4-inch casing
	• Whether TW-A and TW-C will be used in the future development depends on pendir lot planning confirmation. If designated for development, input on the suitable pump for the 4-inch well can be provided. The proposed TW-D and TW-E are planned for a potential development site where they can be used as supply wells. If these wells are unsuitable for future development, abandonment will be considered.
3.	MECP Water Well Records in the vicinity of the site will be reviewed. This includes records in Cedar Lakes Phases 1 and 2 to assess whether the well construction and casing length recommendations were followed.
4.	Water well surveys and sampling will be conducted at nearby private residences to assess th characteristics of water available in the vicinity of the subject site and comply with MECP Procedure D-5-5 and well construction recommendations.
	 Dillon recommends that private well survey letters be distributed to all neighbours, rather than pre-selecting only five wells. The letters would ideally be distributed usir registered mail, creating a reference of the attempted correspondence if property owners later suggest they were not contacted. The City prefers to have this type of record, as most future complaints come through them. It is also recommended that when selecting wells for the survey, those with a depth of 40 meters or more (targeted aquifer) are distinguished from shallower wells, so as to address potential interference. GEMTEC proposed giving all adjacent homes the opportunity to participate in the well survey questionnaire, with a first-come, first-serve approach for sampling. If this approach is taken, rationale must be provided for why it is adequate, and that nearbor metaford wells for the survey.
5.	property owners are satisfied with their level of involvement. The six hour constant flow rate pump tests will be conducted on each of the five test wells, including water level measurements and water sampling (two samples per pump test) in each of the groundwater test wells.
	 Samples will be submitted to an accredited laboratory for 'subdivision package' parameters, after three and six hours of pumping, and 'trace metal' analyses after six

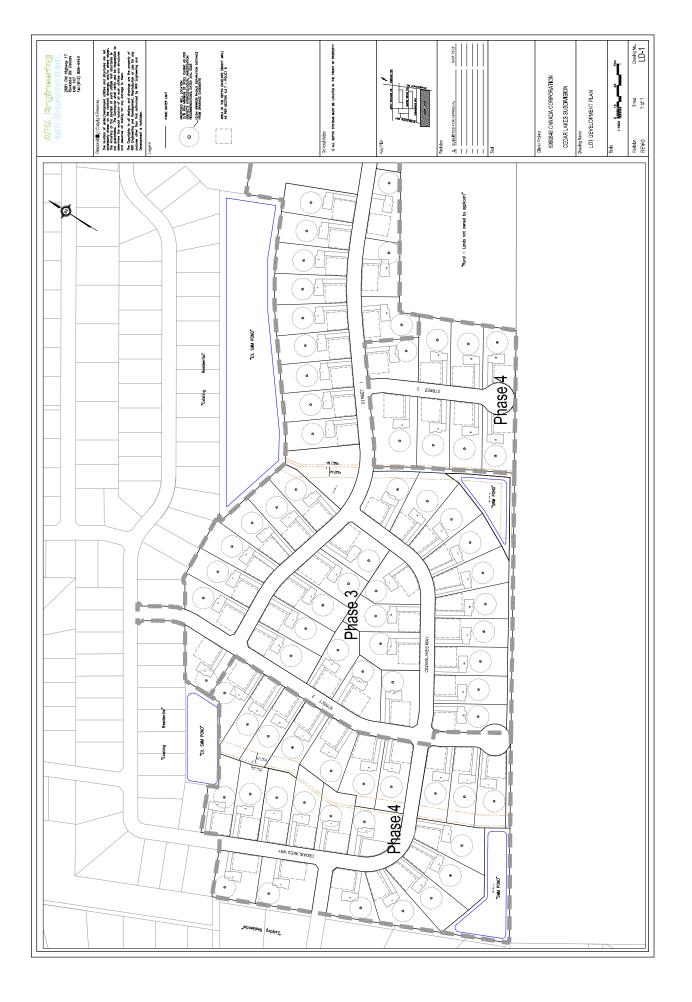
Item	Discussion
	the field during the pump tests. Analytical results will be compared to applicable
	criteria (ODWS).
	• All the test wells will be instrumented with water level data loggers, and a barologger
	will be used onsite.
	 Pre and post pump test groundwater level monitoring should be completed at each
	test well during static conditions.
	 Observation data will also be collected from nearby overburden monitoring wells
	during each pump test.
	 The pumping rate flow will be dependent on each individual well. GEMTEC will try to
	maximize the rate to facilitate the larger hydraulic response but generally use a targe
	maximize the rate to facilitate the larger flydraulic response but generally use a targer maximum rate of 80 L/minute (20 US Gal/min).
Г 1	
5.1.	Radon has been identified as an issue in the area and testing of radon is recommended. The
	investigation should take into account the recent information/suggestions provided by the
	City (Tessa Di'Iorio).
5.0	
5.2.	Pump test water level data will be analyzed to estimate the transmissivity and storativity of
	the groundwater supply aquifer, including drawdown and recovery graphs of each well pump
	test. Interference effects between wells within the proposed residential subdivision will be
	modelled.
5.3.	Long term water level monitoring will be conducted in at least two test wells to monitor
	potential interference between the proposed development and daily water use within Phases
	1 and 2 of Cedar Lakes, which is operating at a denser lot distribution than the proposed
	Phases 3-6.
	• GEMTEC has proposed that long-term monitoring will span from a few weeks to
	couple of months, as seasonal variations generally do not impact interference
	between the wells.
	• Dillon recommends longer-term monitoring over several seasons (as per Section 8.2.5
	of the guidance document), and if an alternative approach is taken (e.g., reducing the
	monitoring period), strong rationale must be provided for why that data is adequate.
	Terrain and Septic Impact Assessment
	Information from previous site investigations (e.g., Paterson, 2011) will be used for assessing
6.	soil conditions, as wells as supplemented with the drilling of 3 overburden monitoring wells.
	 Dillon suggests conducting an additional test pitting or drilling program in previously uncurlered areas particularly in the southwastern region of the site. If a more limits
	unexplored areas, particularly in the southwestern region of the site. If a more limited
	dataset is used for characterizing the site, strong rationale must be provided why that
	is adequate.
7.	Overburden monitoring wells will be strategically placed to aid in monitoring shallow
	groundwater quality (e.g., elevated levels of nitrates) in the shallow groundwater, and the
	hydraulic connection of the overburden aquifer with the bedrock aquifer during pumping test
	of nearby test wells (all monitoring wells).
7.1.	For monitoring background nitrate levels across the site, GEMTEC suggests that conducting one

tem	Discussion
	round of overburden nitrate sampling will be adequate, unless elevated levels are detected
	(i.e., greater than the 2.5 mg/L specified in the guidance document).
	• Dillon suggests that monitoring to assess nitrate levels be conducted over a longe
	period, and that if a more limited approach is taken, strong rationale must be provide
	(e.g., reference to other representative data, how seasonality may impact results, etc.
	Alternatively, sampling could be conducted during conditions that roughly correspon
	with seasonal variations in moisture content, such as following significant rain event
	and dry periods.
	The monitoring program should also consider potential impacts on neighbouring well
	with shallower casings. This might include collecting strategic nitrate samples from
	specific water supply wells during the private well survey/sampling.
	Infiltration rates will be assessed by conducting infiltration testing using a Guelph
3.	Permeameter at six locations.
	Samples will collected at each location for grain size analysis; however, enough grain
	size samples will be collected to adequately characterize all the various soil types
	present across the site.
8.1.	As part of the Impact Risk Assessment for the proposed on-site sewage systems, a water
	balance is typically required for the site.
	It was suggested that a water balance is not required given the reduced number of
	lots and increase in pervious area; however, Dillon suggests that a water balance stil
	be conducted given the vulnerable underlying aquifer, and historical high nitrate
	levels at the site. If a water balance is not completed, corresponding rationale for an
	assumptions or findings must be provided. It should also be noted that a water
	balance will be required as part of the stormwater management assessment and
	report.
	It was also previously noted that the site is located within the Shields Creek
	Subwatershed Study Area, which would require the site to maintain recharge rates
	after development and necessitate a water balance to demonstrate this would be th
	case; however, it appears that the site actually lies just outside this area and is
	therefore not subject to those requirements. That being said, and as noted above,
	rationale must still be provided for not completing a water balance at the site.
	• Regarding whether stormwater pond area can be included in as a recharge area for
	nitrate loading calculations; the conventional approach (and the guidance document
	suggests that this area should be excluded. Dillon recommends adherence to this
	methodology. Given the larger lot sizes, it is unlikely to be a concern.
	Other Discussion Subjects
Э.	Lot Fabric:
7.	 The concept plan showing the location of the septic and well for each lot will be
	provided.
10	Cumulative Well Supply Impact Assessment:
10.	It should be noted that evaluating the impact not only on the targeted aquifer but al
	on shallow wells is important.

Item	Discussion
11.	 Watercourse and Wetland: Dillon specified the necessary setback distance from wetlands and watercourses when planning lot fabrication. Also, they confirmed that the setback area cannot be utilized for lot fabric or septic systems. It was then noted that watercourses run from north to south and have been artificially constructed for Phase 1 and 2. Historically, there were no natural watercourses on the site. There is a registered municipal easement with a 15-meter maintenance corridor indicated on the title. There are no wetlands present on the site.
12.	 Existing PTTW: An existing PTTW (license 7184-BZ5SAE) for groundwater and surface water dewatering was noted, which included 1,500,000 liters/day, dated March 25, 2021 to March 26, 2026 at two locations on the site. GEMTEC confirmed that the existing PTTW is for the construction of the ponds. There is no ongoing water taking and the permits are for construction purposes.

APPENDIX K

Conceptual Lot Development Plan (ARK Engineering)





civil geotechnical environmental field services materials testing civil géotechnique environnementale surveillance de chantier service de laboratoire des matériaux