Appendix B.1 Geotechnical & Hydrogeological Reports

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Preliminary Geotechnical Site Investigation
Village A - Base 31 Residential Subdivision
Picton, Prince Edward County, Ontario

GEMTEC Project: 103306.002

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Submitted to:

PEC Community Partners Inc.
570 Applewood Crescent
Vaughan, Ontario
L4K 4B4

Preliminary Geotechnical Site Investigation
Village A - Base 31 Residential Subdivision
Picton, Prince Edward County, Ontario

September 20, 2024
GEMTEC Project: 103306.002

experience • knowledge • integrity

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September 20, 2024 Project: 103306.002 – Rev0

PEC Community Partners Inc.
570 Applewood Crescent
Vaughan, Ontario
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Attention: Chris Marchese, Development Manager

Re: Preliminary Geotechnical Site Investigation
Village A – Base 31 Residential Subdivision, Picton, Prince Edward County, Ontario

Enclosed is our geotechnical site investigation report in support of the proposed residential development located at the northeast quadrant of Kingsley Road and Church Street (County Road 22) in Picton, Prince Edward County, Ontario. The report presented herein is based on the scope of work summarized in the proposal dated June 25, 2024, and authorization to proceed was provided by PEC Community Partners Inc. on July 11, 2024. This report was prepared by Rafael Abdulla, M.Eng., P.Eng., PMP and reviewed by Timi Olumuyiwa, M.Sc., P.Eng., PMP.

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1.0 INTRODUCTION

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) has been retained by PEC Community Partners Inc. (PECCPI) to carry out a preliminary geotechnical site investigation in support of the design of the proposed residential development to be located at the northeast quadrant of the intersection of Kingsley Road and Church Street (County Road 22) in Picton, Prince Edward County, Ontario (herein referred to as the “Site” – Village A).

The purpose of the geotechnical site investigation was to characterize the general subsurface and groundwater conditions at the Site by means of a limited number of boreholes, laboratory tests and monitoring wells. Based on an interpretation of the information obtained, this report provides geotechnical recommendations for the proposed construction and other aspects of the project, including construction considerations, that could influence design decisions. It should be noted that this report addresses only the geotechnical (physical) aspects of the subsurface conditions at the site. The geo-environmental (chemical) aspects, including the consequences 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 beyond the terms of reference for this assignment and are not addressed herein.

This report is subject to the *Conditions and Limitations of This Report*, which follows the text of the report, and are considered an integral part of the report (Appendix A).

2.0 PROJECT AND SITE DESCRIPTION

2.1 Background Information

The following reports and project documents have been provided to and considered by GEMTEC in the preparation of the geotechnical recommendations:

- Site Concept Plan, Drawing No. DP-01 titled "*Draft Plan of Subdivision*” prepared by Biglieri Group, dated August 15, 2024.
- “Functional Servicing & Stormwater Management Report,” prepared by SCS Consulting Group Ltd. (SCS) dated September 2024.
- Geotechnical Report titled “*Preliminary Geotechnical Investigation, Main Parcel, North parcel, West Parcel, and Southwest parcel, Picton Airport, Prince Edward County, Ontario,*” prepared by Palmer dated July 9, 2021 (Palmer 2021); and,
- Report titled “*Test Pit Observation, Picton Airport/Base 31,*” prepared by Palmer dated November 27, 2023 (Palmer 2023).

2.2 Project Location and Site Description

The Site is located northeast of the intersection of Kingsley Road and Church Street in Picton, Prince Edward County, Ontario as shown on the Site Location Plan (Figure 1 in Appendix B).

The Site occupies an area of approximately 29 hectares (ha) and is vacant and predominantly wooded. The Site is bounded by a residential district to the north, Church Street to the west, Kingsley Road and commercial block to the south and wooded vacant land to the east. An unpaved roadway was observed at the east side of the property.

The topographic information provided by SCS indicates that the Site gently slopes downwards from east to west with elevations (Elev.) ranging from approximately Elev. 140.5 metres (m) to Elev. 147.2 m. The southern portion of the Site was an open area and was generally flat. A tributary of Marsh Creek is located west of Church Street and east of the Site, generally flowing in the north to south direction. It should be noted that Site activities (i.e., earthworks operations) was on-going and the existing grades may be different from those provided in the topographical survey information.

At the time of preparing this report, the information available indicated that the Site will be developed as follows:

- A stormwater management (SWM) pond is proposed for Block 281 (SWM Pond 1) located in the western area of the site adjacent to Church Street. Based on discussions with SCS, it is understood that a second SWM pond is proposed east of Street A, adjacent to Kingsley Road, within Village C (SWM Pond 2). This facility is proposed as a temporary facility SWM pond to service a portion of Village A as well as Street C ahead of the development of Village C.
- Two high-density blocks are proposed northeast and southwest of the proposed SWM Pond 2 adjacent to Church Street.
- Parks and open spaces are planned at different locations within the development.
- The remainder of the Site will be occupied by townhouses and detached houses with the associated access roads. It is understood that the buildings on-Site will be slab-on-grade buildings without a basement level.

Based on the drawings provided by SCS, it is understood that the underground infrastructure will consist of 375 millimetres (mm), 450 mm, 525 mm, and 600 mm diameter storm sewers, 250 mm, 300 mm, 375 mm, 525 mm and 600 mm diameter sanitary sewers, and watermain. A 1050 mm diameter storm sewer will be used to connect Village A to Village C along the southern limit of Street A. The servicing depth will range from about 2.0 m to 3.5 m below finished grades. The proposed sanitary sewers will have inverts ranging from approximately Elev. 139.1 m to Elev. 145.4 m, while the proposed storm sewer will have inverts ranging from approximately Elev. 138.5 m to Elev. 146.2 m.

2.3 Regional Geology

The surficial geology aspects of the general site area were reviewed from the following publications:

- Chapman, L.J., and Putnam, D.F., 2007, "*The Physiography of Southern Ontario*"; 4th Edition, Ontario Geological Survey; and,
- The Ontario Geological Survey, 2003, "*Surficial Geology of Southern Ontario*".

Physiographic mapping in the area according to the above-noted reference indicates that the Site lies within the physiographic region of southern Ontario known as the Prince Edward Peninsula. Prince Edward County is a plain or low plateau of limestone projecting in the eastern part of Lake Ontario and separated from the mainland by the Bay of Quinte. The Prince Edward Peninsula consists of clays, sands/silty sands, and till deposits and is underlain by the Lindsay Formation (Upper Ordovician) / Shadow Lake Formation (Middle Ordovician) bedrock. The surficial geology mapping indicates that the Site lies within an area of Palaeozoic bedrock.

Although not shown on the geology maps, reworked native material associated with the previous land use may be present at the Site. In general, the subsurface conditions encountered during the previous and current investigations were generally consistent with the physiographic and surficial geological mapping.

3.0 PREVIOUS INVESTIGATIONS

As noted above, a preliminary geotechnical investigation and test pit investigation were previously conducted for a larger property and findings are provided in reports provided in Appendix C.

Within the Village A property, the geotechnical report Palmer 2021 involved drilling two boreholes (Boreholes BH21-4 and BH21-5) and four test pits (Test Pits TP21-6 to TP21-9) in the southeastern area of Village A. The subsurface conditions at the boreholes and test pits consisted of topsoil (0.1 m to 0.3 m thick) overlying native sandy silt and gravelly silty clay overlying the bedrock. The upper portion of the overburden may have been disturbed due to past activities. The depth to bedrock at the locations of the test pits and boreholes ranged from about 0.5 metres below ground surface (mbgs) to 1.2 mbgs. Palmer 2021 indicated that the weathered zone in the bedrock observed in the boreholes ranged to depths of approximately 1.2 mbgs and 1.5 mbgs and the RQD ranged from 38 percent to 91 percent.

Palmer 2023 included three test pits (Test Pits TP10, TP11 and TP12) which were excavated in Village A. The subsurface conditions recorded at these locations indicated that the topsoil thickness was about 0.4 m underlain by sandy silt (extending to depths ranging from 0.5 mbgs and 0.8 mbgs) underlain by bedrock.

4.0 CURRENT SITE INVESTIGATION METHODOLOGY

The field work for this current site investigation was carried out from July 22 to 30, 2024 during which time eighteen boreholes, designated as Boreholes BH24-1 to BH24-18, were advanced to depths ranging from approximately 4.6 m to 7.7 mbgs (between Elev. 135.2 m and Elev. 142.5 m). It should be noted that two boreholes (i.e., Boreholes BH24-14 and BH24-15) were advanced within Village C, as requested by SCS. A total of forty-seven test pits, designated as Test Pits TP1 to TP47 were carried out on August 26, 2024, at the southern portion of the Site with thicknesses ranging from approximately 165 mm to 510 mm.

The borehole and test pit locations are shown on the Borehole and Test Pit Location Plan in Appendix B. Descriptions of the subsurface conditions observed in the boreholes are provided on the Record of Borehole Sheets in Appendix D. The results of the geotechnical laboratory tests are provided on the Record of Boreholes and in Appendix E.

The boreholes were advanced using a track mounted drill rig operated by Pontil Drilling of Mount Albert, Ontario, who is a MECP-licensed Water Well Contractor. The field work was observed throughout by a member of our geotechnical engineering staff who directed the drilling operations and logged the samples and boreholes.

The boreholes through the overburden were advanced to the sampling depths by means of continuous flight hollow stem augers using conventional 50-millimetre (mm) external diameter split spoon sampling equipment driven by an automatic hammer in accordance with the SPT procedures outlined in ASTM International standard D1586: "*Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils*". SPT "N"-values were recorded for the sampled intervals as the number of blows required to drive a split spoon sampler 305 mm into the soil, using a 63.5 kg drop hammer falling 750 mm, as per ASTM D1586 procedures. The split-spoon samplers used in the investigation limit the maximum particle size that can be sampled and tested to about 40 mm. Therefore, particles or objects that may exist within the soils that are larger than this dimension were not sampled and are not represented in the grain size distributions contained herein. The results of the field tests (i.e., SPT "N" -values) as presented on the Record of Borehole sheets and in subsequent sections of this report are the values measured directly in the field and are unfactored.

The bedrock was cored using rotary wet coring techniques with HQ core size (63.5 mm outside diameter) at all borehole locations and the results are presented on the Record of Borehole Sheets in Appendix D.

Monitoring wells were installed in seven boreholes. The monitoring wells were constructed using nominal 50 mm diameter, Schedule 40 polyvinyl chloride (PVC) pipe with a No. 10 machine slotted screen (0.01-inch slot). The annular space between the monitoring well screen and surrounding soils was backfilled with a silica sand filter to a maximum of 0.3 m above the top of the screen, and the remainder of the annular space was sealed with bentonite. All monitoring wells were

completed with above-ground steel casing. The monitoring well installation details are provided in the Record of Borehole Sheets (Appendix D).

The field work for this investigation was observed by members of GEMTEC's technical staff, who located the boreholes in the field, arranged for the clearance of underground utilities, observed the borehole drilling, sampling and in situ testing operations, logged the boreholes as well as examined and took custody of the recovered soil and rock samples. The samples were identified in the field, placed in appropriate containers, labelled, and transported to our Oshawa geotechnical laboratory for further visual examination by the project engineer and for laboratory testing.

Groundwater conditions were noted in the open boreholes during and upon completion of drilling and monitoring wells were installed in the bedrock, following the completion of drilling to allow for subsequent groundwater measurements. All other boreholes were backfilled and sealed in accordance with Ontario Regulation (O.Reg.) 903, as amended.

Following completion of the drilling, the soil and rock core samples were returned to our laboratory for examination by a geotechnical engineer. Selected samples were submitted for grain size distribution, uniaxial compressive strength (UCS), and moisture content testing.

The borehole locations were selected by GEMTEC and positioned on-site relative to existing features, including underground and above ground utility constraints. The ground surface elevations and coordinates at the borehole and monitoring well locations were surveyed by SCS in August 2024 and provided to GEMTEC.

A summary of the borehole information (including ground surface elevations and monitoring well locations) are provided in Table 4.1.

Table 4.1 – Summary of Borehole Information

Location	Borehole ID	Ground Surface Geodetic Elevation (m)	Borehole Depth (m)	Notes
Block 280 High Density	BH24-1	145.4	4.7	
Block 281 SWM Pond	BH24-2	143.6	7.7	
Block 279 High Density	BH24-3	142.5	6.2	
Block 281 SWM Pond	BH24-4	143.6	4.7	50-mm diameter monitoring well
Within Development Area	BH24-5	146.6	4.6	
	BH24-6	146.5	4.7	50-mm diameter monitoring well
	BH24-7	146.6	4.7	
	BH24-8	147.0	4.6	
	BH24-9	146.9	4.7	
Along Street A	BH24-10	145.4	6.2	50-mm diameter monitoring well
	BH24-11	143.7	6.2	
	BH24-12	146.0	6.2	
	BH24-13	145.8	6.2	50-mm diameter monitoring well
Block 281 SWM Pond	BH24-14	143.6	6.2	
SWM Pond 2 (Village C)	BH24-15	143.5	4.7	50-mm diameter monitoring well
	BH24-16	143.0	6.2	

Location	Borehole ID	Ground Surface Geodetic Elevation (m)	Borehole Depth (m)	Notes
Block 281 SWMP	BH24-17	141.5	6.2	50-mm diameter monitoring well
Within Development Area	BH24-18	147.2	4.6	50-mm diameter monitoring well

Notes: 1. Bedrock cored in all boreholes (HQ size)

5.0 SUBSURFACE AND GROUNDWATER CONDITIONS

5.1 Subsurface Conditions

The detailed soil profiles encountered in the boreholes are indicated on the Record of Borehole Sheets in Appendix D. The Record of Boreholes indicate the subsurface conditions at the specific borehole locations only. Boundaries between the different soils on the Records are often not distinct, but rather are transitional and have been interpreted. The precision with which subsurface conditions are indicated depends on the method of drilling, the frequency and recovery of samples, the method of sampling, and the uniformity of the subsurface conditions. Subsurface conditions at locations other than the boreholes may vary from the conditions encountered in the boreholes, both laterally and with depth. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties.

The soil descriptions in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil involves judgement and GEMTEC does not guarantee descriptions as exact but infers accuracy to the extent that is common in current geotechnical practice.

Based on the results of the geotechnical investigation, subsurface conditions at the Site generally consist of topsoil overlying silty sand to silty sand and gravel (probably disturbed native soils) overlying the limestone bedrock. The weathered bedrock was encountered at depths ranging from about 0.3 mbgs to 0.8 mbgs.

5.1.1 Topsoil

Topsoil was encountered at all borehole locations and ranged in thickness from about 50 mm to 130 mm. In the test pit locations, topsoil thicknesses ranged from approximately 165 mm to 510 mm. The topsoil thicknesses in the boreholes and test pits and provided in Table 5.1.

Table 5.1 – Approximate Thicknesses of Topsoil

TP/BH ID	Topsoil Thickness (mm)	Test Pit ID	Topsoil Thickness (mm)	Test Pit ID	Topsoil Thickness (mm)	Test Pit ID	Topsoil Thickness (mm)
TP1	229	TP13	203	TP25	279	TP37	267
TP2	267	TP14	203	TP26	216	TP38	343
TP3	279	TP15	508	TP27	178	TP39	279
TP4	191	TP16	229	TP28	229	TP40	483
TP5	229	TP17	508	TP29	241	TP41	216
TP6	406	TP18	406	TP30	165	TP42	381
TP7	394	TP19	318	TP31	305	TP43	203
TP8	343	TP20	241	TP32	292	TP44	254
TP9	406	TP21	229	TP33	267	TP45	191
TP10	305	TP22	267	TP34	381	TP46	203
TP11	330	TP23	241	TP35	356	TP47	254
TP12	254	TP24	203	TP36	394		
BH24-1	75	BH24-6	100	BH24-11	130	BH24-16	130
BH24-2	50	BH24-7	180	BH24-12	50	BH24-17	50
BH24-3	75	BH24-8	75	BH24-13	50	BH24-18	75
BH24-4	125	BH24-9	75	BH24-14	75		
BH24-5	125	BH24-10	130	BH24-15	75		

5.1.2 Overburden

The subsurface conditions of the overburden encountered in the boreholes drilled at the Site are described in the following sections.

Please note that:

- Depths given in the table describing the subsurface conditions are measured from ground surface;
- The SPT “N”-values given are blows for 0.3 m of penetration unless otherwise indicated; and,
- Top of the weathered bedrock was inferred at the depth where the grinding of the augers commenced. However, bedrock coring commenced at a depth of about 1.6 mbgs.

A summary of the encountered soil conditions of the site is presented below in Table 5.2.

Table 5.2 – Summary of Overburden Conditions

Soil Type	Depth (m)		Elevation (m)		SPT “N” Values	Compactness Condition	Approximate Water Content (%)
	From	To	From	To			
Topsoil	0	0.05 – 0.51			-	-	-
Silty Sand with some gravel, Silty Sand and Gravel, and Gravel with some sand and fines	0.05 – 0.51	0.3 – 0.8	141.4 to 147.1	142.2 to 146.7	17 to 50/25 mm	Compact to very dense	1 to 5

The overburden was present in all boreholes near surface, and contained oxidation stains, and rock fragments. Further, the overburden appears to be completely weathered bedrock and has been treated as soil.

5.1.3 Bedrock

Bedrock was encountered at the following depths and elevations at each borehole location as summarized below in Table 5.3. Photographs taken of the rock cores are provided in Appendix F.

Table 5.3 – Approximate Depth and Elevations of Bedrock

Borehole ID	Depth (mbgs)	Geodetic Elevation (m)
BH24-1	0.3	145.1
BH24-2	0.3	143.3
BH24-3	0.3	142.2
BH24-4	0.3	143.3
BH24-5	0.5	146.1
BH24-6	0.3	146.2
BH24-7	0.8	145.8
BH24-8	0.3	146.7
BH24-9	0.4	146.5
BH24-10	0.6	144.8
BH24-11	0.6	143.1
BH24-12	0.3	145.7
BH24-13	0.3	145.5
BH24-14	0.3	143.3
BH24-15	0.3	143.2
BH24-16	0.5	142.5
BH24-17	0.3	141.2
BH24-18	0.3	146.9

The upper 1 m to 1.5 m of overburden overlying the fresh bedrock is anticipated to be completely weathered to highly weathered bedrock.

The fresh bedrock encountered can be described as fine to medium grained, dark grey to black, strong to very strong fresh limestone with shale/siltstone interbeds of the Lindsay Formation. The recovery and quality parameters measured during the rock coring are summarized in Table 5.4.

Table 5.4 – Summary of Rock Quality at Borehole Location

Borehole ID	Run	Total Core Recovery (TCR) %	Solid Core Recovery (SCR) %	Rock Quality Designation (RQD) %
BH24-1	Run 1	100	91	87
	Run 2	100	83	90
BH24-2	Run 1	100	17	0
	Run 2	100	38	0
	Run 3	100	83	22
	Run 4	100	98	93
BH24-3	Run 1	100	97	83
	Run 2	100	92	85
	Run 3	100	97	90
BH24-4	Run 1	100	100	100
	Run 2	100	100	95
BH24-5	Run 1	95	83	83
	Run 2	100	97	87
BH24-6	Run 1	100	100	88
	Run 2	100	100	100
BH24-7	Run 1	100	97	90
	Run 2	100	97	85
BH24-8	Run 1	100	97	97
	Run 2	100	97	88
BH24-9	Run 1	100	90	72
	Run 2	100	97	83
BH24-10	Run 1	100	100	100
	Run 2	100	100	93
	Run 3	100	93	80

Borehole ID	Run	Total Core Recovery (TCR) %	Solid Core Recovery (SCR) %	Rock Quality Designation (RQD) %
BH24-11	Run 1	100	100	95
	Run 2	100	100	90
	Run 3	100	97	92
BH24-12	Run 1	100	98	98
	Run 2	100	97	93
	Run 3	100	100	100
BH24-13	Run 1	100	97	92
	Run 2	100	90	70
	Run 3	100	97	93
BH24-14	Run 1	100	75	60
	Run 2	100	77	67
	Run 3	100	82	75
BH24-15	Run 1	100	100	100
	Run 2	100	100	95
BH24-16	Run 1	100	97	92
	Run 2	100	97	93
	Run 3	100	95	85
BH24-17	Run 1	100	98	97
	Run 2	100	98	98
	Run 3	100	98	97
BH24-18	Run 1	100	95	83
	Run 2	100	97	87
	Average	***100***	***92***	***84***
	Minimum	***95***	***17***	***0***
	Maximum	***100***	***100***	***100***

5.1.4 Geotechnical Laboratory Tests

Grain size distribution testing was undertaken on three samples of the overburden and the results are provided in Appendix E and summarized in Table 5.5.

Table 5.5 – Summary of Grain Size Distribution Tests (Overburden)

Borehole	Sample Depth (m)	Gravel (%)	Sand (%)	Silt / Clay (%)	USCS Soil Description
BH24-4	0.8	30.4	44.0	25.6	Gravelly Silty Sand
BH24-11	0.8 – 1.4	34.6	42.8	22.6	Silty Sand and Gravel
BH24-13	0.8	28.0	46.4	25.6	Gravelly Silty Sand

Three uniaxial compressive strength (UCS) tests were carried out on the HQ size cores and the detailed laboratory results are presented in Appendix E. A summary of the laboratory results is presented in Table 5.6 below:

Table 5.6 – Bedrock UCS Test Results

Borehole	Sample Depth (m)	UCS (MPa)
BH24-4	3.5 – 3.8	105
BH24-6	4.2 – 4.5	53
BH24-9	2.7 – 2.9	88

5.2 Groundwater Levels

Un-stabilized groundwater levels were measured in the open boreholes upon completion of drilling and the details are provided in Record of Borehole Sheets in Appendix D. Groundwater level measured in seven monitoring wells on August 13, 2024, are provided in Table 5.7.

Table 5.7 – Approximate Groundwater Depths and Elevations

Monitoring Wells	Groundwater Depth (mbgs)	Groundwater Elevations (m)
BH24-4	2.8	140.8
BH24-6	1.3	145.1
BH24-10	1.7	143.7
BH24-13	1.2	144.7
BH24-15	1.0	142.5

Monitoring Wells	Groundwater Depth (mbgs)	Groundwater Elevations (m)
BH24-17	3.9	137.6
BH24-18	1.7	145.4

The measured groundwater levels reflect the groundwater conditions in the boreholes at the time of the field work. Groundwater levels at the site are anticipated to vary between and beyond the borehole locations and to fluctuate on a seasonal basis and in response to significant precipitation or snowmelt events.

6.0 DISCUSSION AND RECOMMENDATIONS

This section of the report provides guidance on the geotechnical engineering design aspects of the project based on our interpretation of the boreholes and test pits advanced as part of the site investigation by GEMTEC. It is stressed that the information in the following sections is provided for the guidance of the designers and is intended for this project only. Contractors bidding on or undertaking the works should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of the factual data as it affects their construction techniques, schedule, safety, and equipment capabilities.

The professional services retained for this project include only the geotechnical engineering aspects of the subsurface and groundwater conditions at this site. The presence or implications of possible surface and/or subsurface contamination resulting from previous uses or activities of this site or adjacent properties, and/or resulting from the introduction onto the site from materials from off-site sources are outside the terms of reference for this report and have not been investigated or addressed.

6.1 Topsoil Stripping and Reuse

The following geotechnical comments are provided regarding organic and topsoil stripping and reuse at the Site:

- Surficial vegetation and topsoil should be stripped from the proposed development area.
- Consideration may be given to selective stripping operations, consisting of road allowances, and building footprints (including driveways).
- Outside of road allowances and building footprints, topsoil, if encountered, may be buried and/or reused as general lot fill to raise grades. The primary factor controlling methane generation is the organic carbon content of the topsoil. The loss on ignition (LOI) test provides an indication of the organic carbon content of the sample. If topsoil is to be reused as general lot fill to raise grades, then LOI testing should be carried out and further recommendations provided by the geotechnical engineer in regard to the reuse of topsoil

and the potential for methane generation. Stripping of organically stained layers would not be required in any site area from a geotechnical perspective. However, from a construction viewpoint, it may not be practical (or possible) for the contractor to distinguish between this zone and the overlying topsoil, if encountered, especially if cuts of less than 150 mm are required. Where topsoil is to be reused for landscaping, fertility testing should be carried out.

- Where low organic content topsoil is used as general lot fill, its thickness should be limited to about 1.5 m. The topsoil fill should be placed in maximum 300-mm thick loose lifts and uniformly compacted to at least 95 percent of standard Proctor maximum dry density (SPMDD). To have any success in placing topsoil as lot grading fill, it must be placed at or very close to its optimum water content to achieve workability and adequate compaction, in order to reduce post-construction settlements and/or lateral movements (e.g., of fences, etc.).
- It should be noted that the topsoil thicknesses vary within the site. As such, it is recommended that a topsoil test pit program should be carried out once the trees within the site has been completely removed to confirm the topsoil thickness within the northern half of the site.

6.2 Site Preparation

At the time of preparing this report the preliminary drawings indicate that the Site will be developed in three phases. The preliminary grading plan indicates that design grades will include some cut and fill for site grading operations which will be required to establish final grade levels throughout the Site and will not exceed 2 m.

In Palmer's test pits and boreholes, disturbed native soils were observed near surface at the southern portion of the Site (i.e., the open area outside of the woodlots). However, the in situ test completed in the boreholes indicate a very dense compactness condition which is representative of a competent soil unit. As such, it is recommended that this area be compacted and proofrolled upon topsoil stripping. During detailed design, additional boreholes should be positioned at the southern portion of the Site to confirm the competency and presence of disturbed materials.

The exposed subgrades (soil or bedrock) should be proofrolled and/or visually inspected by a qualified geotechnical engineer prior to placement of engineered fill. Any loose/soft soils identified at the time of proofrolling that are unable to uniformly be compacted should be sub-excavated and removed. The excavations created through the removal of these materials should be backfilled with approved engineered fill consistent with the recommendations provided below.

It is strongly recommended that construction should be carried out under dry conditions. If construction is required during freezing temperatures, the subgrade should be protected immediately from freezing using straw, propane heaters and insulated tarpaulins, or other suitable means. Backfilling during the winter is not recommended, but recommendations can be provided if required.

6.3 Engineered Fill

As noted above, grade raise of up to 2 m is anticipated within the Site. As such, engineered fill will be required to achieve final grades and support structural elements such as foundations and / or floor slabs depending on the Cut and Fill Plan. The following is recommended for the construction of engineered fill:

- Prior to placing engineered fill, topsoil and any disturbed native soil, or deleterious materials should be removed from the Site. The disturbed native soil (if encountered) can be re-used as engineered fill. Ponded water and sloughed soil due to erosion during rainfall event should be cleaned and/or re-compacted.
- Based on the soil classification and frost group described in Table 14.1 of the *Canadian Foundation Engineering Manual* (CFEM, 2023), the non-cohesive deposits encountered on the Site are regarded as being of low to moderate frost susceptibility. This should be considered for any design elements exposed to freezing temperatures (concrete flatworks, exterior concrete slabs, and the like).
- The subgrade or base of the engineered fill area must be approved by GEMTEC prior to placement of any new fill, to ensure that suitability of subgrade condition. The area(s) should then be proofrolled in conjunction with an inspection by GEMTEC to confirm that the exposed soils are native, undisturbed, and competent, and have been adequately cleaned of ponded water and all disturbed, loosened, softened, organic and other deleterious material. Any of the localized near-surface soils containing organic matter or loose soils will also need to be removed prior to placement of engineered fill as directed by GEMTEC during proofrolling.
- Materials for reuse as engineered fill must be approved by GEMTEC prior to placement and should be free of organic, and deleterious materials. In this regard, the native non-cohesive soil which are near their optimum water contents and do not contain topsoil or organics or any other deleterious materials can be reused on site as engineered fill. The materials for use as engineered fill must be maintained within about 2 percent of optimum water content for compaction. The natural water contents of the native non-cohesive soil are below their optimum water contents and wetting of these soils will be required during fill placement to achieve compaction.
- If native soils from the site are not used as engineered fill, imported material for engineered fill should consist of clean, non-organic soils, free of chemical contamination or deleterious material. Imported materials to be used for engineered fill must be approved by GEMTEC at the source(s), prior to hauling to the Site. In this regard, imported materials which meet the requirements for OPSS 1010.MUNI Select Subgrade Material (SSM) placed in maximum 300 mm thick loose lifts and uniformly compacted to 98 percent of SPMDD throughout. The water contents at the time of placement should be within +/- 2 percent of its optimum moisture content to achieve the required compaction. Placement of fill is not recommended in the winter season, if unavoidable, any frost penetration into the fill

material must be removed prior to placement of subsequent lifts of fill and reviewed by GEMTEC. Additional recommendations will need to be provided at detailed design.

- Excavated bedrock maybe crushed and reused on site as granular fill for backfilling purposes. Depending on the gradation, a bulk up factor of 25 percent to 50 percent is typical for this rock type, and a 40% value maybe be used as an average for the bedrock. It should be noted that the completely weathered rock will have its engineering behaviour similar to a soil while highly weathered rock will be easier to breakdown (in comparison with moderately weathered to fresh bedrock) and re-compact due to the material being a combination of soil and rock. Equipment should be selected based on the encountered material.
- Cobbles and boulders exceeding 150 mm in diameter should be removed from the engineered fill prior to compaction. It is recommended that the contractor consider the possible presence of cobbles / boulders and bedrock or other obstructions when developing their excavation and engineered fill construction methodology.
- Full time testing and inspection during fill placement is required as outlined in Section 4.2.2.2 of the 2012 Ontario Building Code (OBC).

6.4 Shallow Foundations

At the time of writing this report, information available indicated that the residential buildings will be slab-on-grade without any basements. Proposed building foundations, floor slabs, pavements or other settlement-sensitive structures may be supported on approved native undisturbed compact soils that are free of organics and other deleterious materials, on approved engineered fill materials or on the bedrock.

Based on the subsurface information, the proposed residential structures can be supported by conventional strip and/or spread footing foundations founded on engineered fill, compact to very dense native soils (potentially completely to highly weathered bedrock), or on the fresh bedrock.

The spread/strip footings may be designed using the factored geotechnical resistance at Ultimate Limit States (ULS) and the unfactored geotechnical reaction at Serviceability Limit States (SLS) for 25 mm total settlement and 19 mm differential settlement provided below in Table 6.1.

Table 6.1 – Recommended ULS and SLS for Shallow Foundations

Footings Dimensions	Factored Geotechnical Resistance at ULS	Geotechnical Reaction at SLS (for 25 mm of settlement)	Founding Soils
1 m x 1 m to 3 m x 3 m spread footings Strip footings 0.9 m wide	225 kPa	150 kPa	Engineered Fill or undisturbed compact native soils.

Footings Dimensions	Factored Geotechnical Resistance at ULS	Geotechnical Reaction at SLS (for 25 mm of settlement)	Founding Soils
1 m x 1 m to 3 m x 3 m spread footings Strip footings 0.9 m wide	375 kPa	250 kPa	Dense to Very Dense undisturbed native non-cohesive soils.
5 m x 5 m spread footings, maximum. Strip footings up to 1.2 m wide	5 MPa	ULS capacity govern	Slightly weathered bedrock.
5 m x 5 m spread footings Strip footings up to 1 m wide	10 MPa	ULS capacity govern	Fresh bedrock at depths of greater than 2.5 mbgs adjacent to Church Street.*

Note: *Please note that at Borehole BH24-2 competent bedrock was encountered at 5 mbgs (Elevation 138.6 m) and foundation base should be inspected and approved by GEMTEC to confirm the presence of the competent bedrock.

The factored ULS bearing resistance for the bedrock was assessed based on the required bearing resistance factor of 0.5 for shallow spread/strip footings. The SLS reaction values for less than 25 mm of settlement were also assessed for the various sizes of footings. At the calculated ULS values settlements were below the SLS value of 25 mm for strip footings up to 1 m wide and for spread footings up to 5 m x 5 m (i.e., the SLS reaction for 25 mm of settlement would exceed the factored ULS resistance, and hence, the ULS resistance value will govern the design).

As the actual soil bearing resistances are related to the actual footing sizes and founding depths, the foundation recommendations must be reviewed by GEMTEC once the building details are finalized and, as such, the recommendation provided above should be considered preliminary.

To mitigate differential settlement, as much as possible, foundations should not be supported by different materials, that is, the foundations should entirely be founded on the bedrock, competent native materials or engineered fill.

If stepped spread footings are constructed at different founding levels, the difference in elevation between individual footings should not be greater than one half the clear distance between the footings (2H:1V or gentler). Should this not be possible, GEMTEC should be consulted to provide field inspection to ensure that the footings exceeding the above requirement are stable and the bearing and lateral support for the upper footing is not compromised. In addition, the lower footings should be constructed first so that if it is necessary to construct the lower footings at a greater depth than anticipated, the elevations of the upper footings can be adjusted accordingly.

Stepped strip footings, if required, should be constructed in accordance with the latest edition of the Ontario Building Code (2015 OBC), Section 9.15.3.9.

The founding materials are susceptible to disturbance by construction activities especially during wet weather and care should be taken to preserve the integrity of the materials as bearing strata. Prior to placing concrete for the footings, the foundation excavations must be inspected by GEMTEC to confirm that the footings are located in a native, undisturbed, and competent bearing stratum which has been cleaned of ponded water and loosened or softened material. If the concrete for the footings on the native soil cannot be placed immediately after excavation and inspection (i.e., within 24 hours of excavation and inspection), it is recommended that a working mat of lean concrete be placed in the excavation to protect the integrity of the bearing stratum. The bearing soil and fresh concrete must be protected from freezing during cold weather construction.

For shallow foundations in bedrock, it is recommended that the footings be founded on a flat lying surface to convey loads vertically to the bedrock. All footing excavations must be inspected prior to placing concrete to ensure that the base has been adequately cleaned, and that the bedrock conditions as exposed at the founding level are consistent with the design assumptions. Where possible, the footing foundations should be excavated to provide a flat bearing surface at right angles to the axis of the loads. Rock protrusions, cavities, or large open joints should be avoided to provide a uniform bearing pressure across the full area of the footing. All loose, shattered or highly weathered rock within the footprint of the footings and at the footing level should be removed and replaced with concrete with a 28-day compressive strength of at least 15 MPa. All footing foundations should be cleaned of deleterious material. Also, all footings must be inspected by a geotechnical engineer prior to placing any concrete for the footings.

6.4.1 Frost Penetration

Based on the Ontario Provincial Standard Drawing (OPSD) 3090.101, the typical frost penetration depth is expected to be approximately 1.4 mbgs. All exterior footings and footings in unheated areas should be provided with at least 1.4 m of earth cover after final grading or a thermally equivalent thickness of insulation, in order to address the potential for damage due to frost action.

6.4.2 Foundation Walls and Isolated Piers

To avoid ad-freeze and possible jacking (heaving) of the foundations, the interior and exterior of the foundation walls should be backfilled with free draining, non-frost susceptible material that meets OPSS requirements for Granular B Type I or II. The backfill should be compacted in maximum 300 mm thick lifts to at least 95 percent SPMDD using suitable vibratory compaction equipment. Alternatively, where the native soils are used as backfill at the building exterior, appropriate external insulation (e.g., a semi-rigid glass fibre/SM Styrofoam) should be installed to help absorb the adfreezing forces. The insulation should extend to the footing depth. Where the backfill will ultimately support areas of hard surfacing (pavement, sidewalks, or other similar

surfaces), the backfill should be placed in maximum 200 mm thick lifts and compacted to 95 percent SPMDD using suitable compaction equipment.

Backfilling against isolated (unheated) walls or piers should consist of free draining, non-frost susceptible material meeting OPSS Granular B Type I or II requirements. Other measures to prevent frost jacking of foundation elements can be provided if required.

Where areas of hard surfacing (pavement etc.) abut the proposed structures, a gradual transition should be provided between those areas of hard surfacing underlain by non-frost susceptible granular wall backfill and those areas underlain by existing frost susceptible material to reduce the effects of differential frost heaving. It is suggested that granular frost tapers be constructed from 1.4 m below finished grade to the underside of the granular subbase material for the hard surfaced areas. The frost tapers should be sloped at 1H:1V or flatter.

In general, for any structure placed wholly or in part on engineered fill, it is recommended that the foundation walls be provided with nominal reinforcement with reinforcing steel at the top and bottom of the foundation walls. This could typically consist of two 10 M bars in the top and two 10 M bars in the bottom of the walls. The bars should be placed as close as possible allowing for at least 50 mm of cover. Corner bars should have proper factory bends and all tied steel should have at least 600 mm of overlap. At window well locations, two 10 M bars should be placed in the foundation wall as close to the sill as possible (allowing for 50 mm of cover). The bars should extend laterally at least 600 mm beyond the edge of the window opening. The actual design should be approved by the home builder's structural engineer.

A perforated perimeter drain should be provided at the level of the bottom of the footings where the floor slab is at or above the exterior final grade. The drain should outlet by gravity to a storm sewer or to a sump pit from which the water is pumped to a suitable outlet.

6.4.3 Seismic Site Classification

Seismic hazard is defined in the 2012 OBC (as amended) by uniform hazard spectra (UHS) at spectral coordinates of 0.2 second, 0.5 second, 1.0 second and 2.0 seconds and a probability of exceedance of 2 percent in 50 years. The OBC method uses a site classification system defined by the average soil/bedrock properties (e.g., shear wave velocity, Standard Penetration Test (SPT) resistance, undrained soil shear strength, etc.) in the 30 m of the soil profile extending below the foundation level. There are six site classes from A to F, decreasing in ground stiffness from A, hard rock, to E, soft soil; with site class F used to denote problematic soils (e.g., sites underlain by thick peat deposits and/or liquefiable/collapsible soils). The site class is then used to obtain acceleration and velocity-based site coefficients F_a and F_v, respectively, used to modify the UHS to account for the effects of site-specific soil conditions in design.

The site classification recommendation is based on the available information as well as our interpretation of conditions below the boreholes and our knowledge of the soil/bedrock conditions

in the area. In accordance with Table 4.1.8.4.A of the OBC (2012), it is recommended that Site Class “C” (very dense soils and soft rock) be applied for structural design at the Site. The site classification may be improved by site-specific testing such as seismic cone penetration testing or multi-channel analysis of surface waves (MASW) testing.

6.4.4 Slab-on-Grade (Heated Areas Only) Floor

It is anticipated that the floor slab can be designed as a concrete slab-on-grade. Based on the existing borehole information, the subgrade will consist of engineered fill or compact to very dense native soils, and limestone bedrock. The final rock surface should be cleared of any loose or shattered rock and debris for slab in the bedrock.

Any low areas may be brought up to within at least 200 mm of the underside of the floor slabs, as required, using Ontario Provincial Standard Specification (OPSS) Granular ‘B’, Type I material or other approved material, placed in maximum 200-mm thick loose lifts and uniformly compacted to at least 98 percent of the material’s SPMDD.

The final lift of granular fill beneath floor slabs should consist of a minimum thickness of 200 mm of OPSS 1010 Granular A compacted to 100 percent of its SPMDD in order to create a stable working surface, to distribute loadings, and for drainage purposes.

The floor slabs should be structurally separate from the foundation walls and columns. Sawcut control joints should be provided at regular intervals and along column lines to control shrinkage cracking and to allow for differential settlement of the floor slabs.

6.5 Temporary Excavation

Depending on the finished grades, finished floor elevations, and pipe inverts, it is anticipated that excavations for the construction of the shallow foundations, SWM ponds, site services and structures will extend into engineered fill, and the compact to very dense non-cohesive deposits and the underlying bedrock.

6.5.1 Overburden Excavation

The sides of the excavations should be sloped in accordance with the requirements in Ontario Regulation 213/91 under the Occupational Health and Safety Act (OHSA). It is anticipated that temporary excavations in engineered fill can be classified as Type 3 soils with unsupported side slopes no steeper than 3 horizontal to 1 vertical (3H:1V). Where excavation is mostly carried out within the dense to very dense native soils, these soils can be generally classified as Type 2 and, accordingly, allowance should be made for excavation side slopes of 1H:1V sloped to a depth of 1.2 m or less from the base of the excavation.

Where the side slopes consist of more than one soil type, the soil shall be classified as the type with the highest number among the soil types present. Please note that if the excavation extends below the groundwater table without adequate dewatering, the soil at the face of the excavation

would be classified as Type 4. The soil type classifications indicated above are provisional and are subject to change based on field observations of the actual conditions at the time of exposure.

Flattening and / or blanketing of the side slopes may be required in the non-cohesive materials depending on the weather conditions and construction procedure adopted by the contractor. Further, excavations should be left open for as short a duration as possible and completely backfilled at the end of each working day.

All excavated material should be stockpiled well away (i.e., minimum 2 m) from the sides / crest of the excavation. In general, stockpiles of excavated materials should be kept at least the same horizontal distance from the top edge of the excavation as the depth to not negatively impact excavation slope stability, subject to confirmation by a geotechnical engineer in the field during construction.

6.5.2 Bedrock Excavation

All excavations should be carried out in accordance with Ontario Regulation 213 (Ontario Occupational Health and Safety Act, OHSA, for Construction projects).

The measured UCS of the selected rock samples ranged from about 53 MPa to 105 MPa and it is anticipated that the rock excavation in the Lindsay Formation will require the use of hydraulic rock breakers (i.e., hoe ramming) and large hydraulic excavators may not be able to penetrate the shale or limestone encountered in the boreholes.

A hydraulic excavator equipped with rock teeth may be able to excavate fractured bedrock horizons, but will need to be supplemented with equipment such as a road header or hydraulic rock breaker in the more competent bedrock at depth. The rate of excavation through the bedrock is highly dependent on the method and equipment chosen by the contractor. Any excavations into a minimum of moderately fractured bedrock (150 mm to 300 mm bedding planes) can have vertical side slopes; excavations in closely fractured bedrock (20 mm to 150 mm bedding planes) should be benched or sloped back with side slopes no steeper than 1H:1V, provided that all loosened rock fragments are removed from the excavated rock faces.

Alternatively, blasting may be considered for excavation into the fresh strong to very strong limestone bedrock. Blasting would be carried out by a specialist contractor.

Noise, vibration and dust would be a significant issue during excavation of the bedrock. Pre- and post-construction condition surveys are recommended on structures (if any within the zone of influence) that could be impacted by the construction activities.

6.6 Temporary Groundwater Control

The groundwater levels measured in the monitoring wells installed were about 1.0 mbgs to 3.9 mbgs (or Elev. 137.6 m to 145.4 m) at the time of the investigation in August 2024. It is anticipated that excavations will be generally extend below the groundwater level. Based on these

observations, it is assumed that the groundwater table will be within the bedrock; however, it should be noted that the groundwater table is influenced by seasonal fluctuations and major precipitation events. Large open excavations or excavations extending into the bedrock may experience groundwater seepage during heavy precipitation events. Therefore, minor groundwater seepage may be anticipated during typical excavations but should be controllable with filtered sumps and pumps. In any event, groundwater levels should be lowered to at least 1 m below the excavation invert.

The rate and volume required for dewatering will be dependent on the depth of the required excavations, the groundwater levels at the time of construction and the construction methods and staging chosen by the Contractor.

Water takings in excess of 50 cubic metres per day (m^3/day) are regulated by the Ministry of the Environment, Conservation and Parks (MECP). Certain takings of groundwater and storm water for construction site dewatering purposes with a combined total less than 400 m^3/day qualify for self-registration on the MECP's Environmental Activity and Sector Registry ("EASR"). Registration on the EASR replaces the need to obtain a PTTW and a Section 53 approval. A Category 3 PTTW is required where the proposed water taking is greater than 400 m^3/day.

The dewatering system is the Contractor's responsibility and the rate and volume required for dewatering is dependent on the construction methods and staging chosen by the contractor. Further, the contractor will be responsible for obtaining any required discharge approvals.

6.7 Site Servicing

Preliminary details of the proposed watermain, sanitary and storm sewers for the proposed development have been provided and are shown on the preliminary servicing plan provided by SCS.

As noted above, it is understood that the underground infrastructure will consist of storm sewers, sanitary sewers, and watermain. The servicing depth will range from about 2.0 m to 3.5 m below finished grades. The proposed sanitary sewers will have inverts ranging from approximately Elev. 139.1 m to Elev.145.4 m, while the proposed storm sewer will have inverts ranging from approximately Elev. 138.5 m to Elev. 146.2 m.

Based on the pipe inverts and the subsurface conditions within the Site, the proposed services are anticipated to be founded on the dense to very dense native non-cohesive deposits, and in the limestone bedrock which are considered suitable for supporting sewers and watermains, provided that the integrity of the base can be maintained during construction. As such, excavation for the underground utilities will be challenging due to the presence of bedrock.

Based on the final grade as shown on the preliminary grading plan, the invert of the proposed underground services within the site will have a soil cover of at least 1.4 m below finished grade for frost protection.

6.7.1 Pipe Bedding and Cover

The bedding for watermains and sewers should be compatible with the size, type, and class of pipe, surrounding soil and loading conditions and should be designed in accordance with provincial and municipal standards.

Where granular bedding is deemed to be acceptable, it should consist of at least 200 mm of well graded crushed stone meeting OPSS gradation requirements for Granular A or 19 mm Crusher Run limestone material. Crushed rock mined from the Site can be used as bedding meeting the gradation of OPSS 1010 Granular A. The physical properties as per OPS standards must be confirmed and met prior to use on-Site.

Cover material, from pipe spring line to at least 300 mm above the top of the pipe, should consist of granular material, such as OPSS Granular A or sand. The use of ‘high-performance bedding' as the bedding or cover material should not be permitted.

The bedding and cover materials should be compacted in maximum 200 mm loose lift thickness to at least 98 percent SPMDD.

6.7.2 Trench Backfill

Most of the excavated materials will consist of engineered fill, native non-cohesive soils and bedrock. Excavated bedrock from Site may be crushed and reused for backfilling of utility trenches. The excavated material from the Site may be used as trench backfill, provided they are free of significant amounts of topsoil, organics or other deleterious material and are placed and compacted as outlined below. All topsoil, if encountered, and organic materials should be wasted or used for landscaping purposes. All oversized cobbles and boulders (i.e., greater than 150 mm in size) should be removed from the backfill.

All trench backfill, from the top of the cover material to subgrade elevation should be placed in maximum 300-mm thick loose lifts and uniformly compacted to at least 95 percent of the material’s SPMDD.

Alternatively, the trench may be backfilled with imported free draining, non-frost susceptible granular or sandy material. The material should meet OPSS gradation requirements for SSM or Granular A. To minimize future settlement of the backfill and achieve an acceptable subgrade for the roadways, curbs, driveways, etc., the backfill material should be compacted in maximum 300 mm loose lift thickness to a minimum 95 percent SPMDD from the top of the cover material to 1.0 m below the subgrade elevation. The upper 1 m of the backfill should consist of granular material and compacted to at least 98 percent SPMDD to support the pavement structure. Oversized cobbles and boulders (i.e., greater than 150 mm in size) should be removed from the backfill.

Normal post-construction settlement of the compacted trench backfill should be expected. As such, consideration could be given to implementing one or a combination of the following measures to reduce post construction settlement above the trenches, depending on the weather conditions encountered during the construction:

- Allow the overburden materials to dry prior to compaction; and / or,
- Make provision to defer final paving of the surface course asphalt in the roadway for 3 months, or longer, to allow the trench backfill settlement to occur and thereby improve the final roadway appearance.

6.7.3 Trench Cut-Offs

Where the invert levels of the services are located below the measured groundwater levels, consideration should be given to installation of low hydraulic conductivity water-stops or cut-offs (trench plugs) at strategic locations in accordance with OPSD 802.095. This should be done, as appropriate, to reduce the potential for preferential groundwater flow through the granular bedding and trench backfill where the trench is within the bedrock or along steep grades. The need for and frequency of trench plugs should be evaluated during the detailed design phase and should be considered at the construction limits, and equally spaced at a maximum 100 m spacing (depending on pipe length, may be less).

6.8 Stormwater Management Ponds

Based on the preliminary grading plan provided by SCS, the base of the SWM Pond 1 and SWM Pond 2 will be at approximately Elev. 138 m and Elev. 139 m, respectively. Boreholes BH24-2, BH24-4, BH24-14 and BH24-17 were advanced at the location of SWM Pond 2. Boreholes BH24-15 and BH24-16 were advanced at the location of SWM Pond 4 which is located in Village C.

The normal water level in the SWM Pond 1 and SWM Pond 2 are anticipated to be at approximately Elev. 138 m and Elev. 141 m. Design details of the SWM ponds were not available at the time of preparing this report. Additional geotechnical comments can be provided once the design details have been finalized. Excavations for the SWM ponds are anticipated to extend about 2.5 mbgs to 4.6 mbgs.

- Based on the subsurface conditions encountered within the SWM ponds, the subsurface soil conditions below the topsoil are expected to generally consist of compact to very dense non-cohesive deposits (silty sand to silty sand and gravel) overlying the bedrock. The inverts of the SWM ponds are anticipated to be within the bedrock.
- The measured shallow groundwater level in the monitoring wells installed in Boreholes BH24-4 and BH24-17 were at 2.8 mbgs and 3.9 mbgs on August 13, 2024 (Elev. 140.8 m and Elev. 137.6 m, respectively). At Borehole BH24-15 the groundwater level was measured at a depth of about 1.0 mbgs (Elev. 142.5 m). Considering that the

groundwater elevations are higher than the water level in the pond, groundwater inflow into the pond should be anticipated.

- If the potential mixing of the stormwater and groundwater is of no concern, a pond liner would not be required. If separation of groundwater and pond water is a requirement, a geosynthetic clay liner (GCL).
- Riprap, 50 mm Crusher Run Limestone or similar materials (crushed bedrock) are recommended to protect the geosynthetic clay liner (GCL) and at the pond bottom and up the side slopes to prevent damage by backhoes at the time of pond cleanout and servicing. A minimum thickness of 600 mm is recommended.
- Further, considering that excavation will be in bedrock, effort should be made to ensure the SWM pond base is free of sharp and protruding rock faces, which could puncture the proposed GCL. Alternatively, a 300 mm thick layer of soil should be placed at the bottom of the bedrock face prior to placement of the GCL.
- Groundwater flow is expected from the non-cohesive deposits during precipitation events and also from within the bedrock. Excavation of the SWM pond within these non-cohesive deposits is recommended to be carried out when groundwater levels are expected to be the lowest (i.e., late summer and fall). It is recommended that long-term monitoring of the groundwater levels be carried out to determine the lowest groundwater levels.
- Access roads are recommended to be compacted to 100 percent SPMDD.
- Any constructed berms around the pond should have a top width of at least 3 m to allow access by maintenance vehicles. The material used to construct the berms should be approved by the geotechnical engineer prior to placement. The approved material used to construct berms should be placed in maximum 300 mm thick loose lifts and uniformly compacted to at least 98 percent of the material's SPMDD.
- Further to the above, care should be taken to ensure homogeneity of the constructed berm (i.e., no erodible layers). The prepared foundation for the berm should be inspected by the geotechnical engineer prior to placement of berm fill material. Additional recommendations can be provided once design has been advanced.
- The pond should be equipped with an emergency spillway or similar structure(s) designed to eliminate the possibility of over-topping of the berms.
- Where pipes enter or exit the pond, they should be provided with a concrete collar and be backfilled with a relatively impermeable material (e.g., imported clayey soil) to reduce preferential flow through the pipe bedding and backfill and possible loss of ground. Pipes entering or exiting the pond should be sized and designed to allow for cleaning. The exposed end of the riser portion should be provided with a protective wire mesh or the like to prevent unauthorized access (e.g., by children).
- Alternatively, a trench plug (i.e., a clay seal or unshrinkable fill) at least 1 m long as per OPSD 802.095 can be placed along the inlet and outlet pipes where they pass through the pond slopes. The clay should be placed at water contents of +/- 2 percent of the standard Proctor optimum water content.
- All exposed surfaces should be covered with topsoil and seeded upon completion.

- The monitoring wells installed in the boreholes drilled as a part of the geotechnical investigations could provide a conduit for groundwater flow. It will be important that following the construction of the pond, all monitoring wells, piezometers, well points and the like be properly abandoned in strict accordance with Ontario Regulation (O. Reg.) 903 amended by O.Reg. 128/03 of the Ontario Water Resources Act.
- Regular inspections by the geotechnical engineer should be carried out during the pond construction. The final pond side slopes should be sodded or otherwise similarly treated to reduce erosion. Maintenance will be required over the first several years until the vegetative mat has taken root.

Further comments and revisions on the above recommendation and construction of the SWM ponds may be provided once the design drawings have been finalized.

6.9 Asphalt Pavement Construction

6.9.1 Pavement Structure

Based on the results of the geotechnical investigation and on review of the preliminary grading plan provided, it is our understanding that the roads within the development will be used for residential use and classified as a Local Road.

Traffic information was not available at the time of this report preparation, as such, the recommended minimum pavement structure design has been developed for two traffic loading scenarios, light duty and heavy duty and provided in Table 6.2.

Table 6.2 – Flexible Pavement Design Recommendations

Pavement Layer	Light Duty Pavements / Local Roadways	Heavy Duty Pavements / Collectors / Fire Route
Surface Course Asphalt	40 mm HL3	50 mm HL3
Binder Course Asphalt	50 mm HL8	70 mm HL8
Granular Base	150 mm Granular A	150 mm Granular A
Granular Subbase	300 mm Granular B Type I or II	400 mm Granular B Type I or II

The heavy-duty design is appropriate for areas where heavy trucks and maintenance vehicles are anticipated to drive while the light duty design is appropriate for areas where no heavy traffic is anticipated.

GEMTEC should be allowed to review the drawings and provide additional recommendations if the design differs from our assumptions. In general, heavy-duty pavement should be provided for access roads and where trucks will be present.

6.9.2 Effects of Subgrade Disturbance

If the road subgrade surface becomes disturbed or wetted due to construction operations or precipitation, or the granular pavement materials are to be used by construction traffic, the Granular B thicknesses provided above may not be adequate and it may be necessary to increase the thickness of the Granular B subbase or exclusively use Granular B, Type II subbase. The contractor should be responsible for providing suitable access for construction equipment.

The required thickness of the subbase materials will depend on a number of factors, including contractor workmanship and schedule, contractor methodology, soil types, and weather conditions, and should be assessed by geotechnical personnel at the time of construction. In our opinion, the recommended approach for subgrade preparation from a geotechnical point of view is to:

- Proofroll the subgrade conditions at the time of construction under the supervision of experienced geotechnical personnel; and,
- Adjust the thickness or type of the subbase material and include a woven geotextile separator, as required. Unit rate allowances should be made in the contract for sub-excavation and replacement with OPSS Granular B, Type II (as required).

6.9.3 Asphaltic Cement

Performance graded PG 58-28 asphaltic cement is recommended for the road construction. The final asphalt surface should be sloped at a minimum of 2 percent to shed runoff.

6.9.4 Granular and Asphalt Material Placement

The pavement granular materials should be compacted in maximum 300 mm thick loose lifts to the 100 percent SPMDD using suitable vibratory compaction equipment. Crushed rock mined from the Site can be used as granular subbase meeting the requirements of OPSS 1010 Granular B, Type II. However, the physical properties as per OPS standards must be confirmed and met prior to use on-Site.

The asphalt materials should be compacted to at least 92 percent of their Marshall Maximum Relative Density according to OPSS 310, as measured in the field using a nuclear density gauge.

6.9.5 Transition Treatments

In areas where the new pavement structure will abut existing pavements, the depths of the granular materials should taper up or down at 5H:1V, or flatter, to match the depths of the granular material(s) exposed in the existing pavement. Any undermining or broken edges resulting from the construction activities should be removed by saw cut. All milled surfaces and butt joints should be properly tack coated prior to asphalt placement.

6.9.6 Pavement Drainage

In order to provide drainage of the granular base and subbase, the granular material should extend to ditches or drainage outlets. The bottom of the granular subbase layer should be at least 0.3 m above the bottom of the ditch or drainage outlet and should have positive drainage away from the site.

If storm sewers and catch basins are installed, it is suggested that continuous subdrains connected to catch basins be provided along the perimeter of both sides of all roadways to assist with drainage of the pavement structure. These drains should be installed at the bottom of the subbase layer.

7.0 ADDITIONAL CONSIDERATIONS

7.1 Monitoring Well Abandonment

All monitoring wells installed as part of this investigation should be decommissioned when no longer required by a licensed Water Well Contractor in accordance with applicable legislation. The well abandonment could be carried out in advance of or during construction.

7.2 Corrosion Considerations

The potential for the subsurface soil and groundwater conditions to corrode concrete and steel elements, or the like, should be considered in the final design. Additional sampling and / or testing may be required, or suitable protection measures (i.e., sulphate resistance concrete, sacrificial thickness, cathodic protection, etc.) should be considered by the designer.

7.3 Management of Excess Soil

It is noted that the professional services retained for this project include only the geotechnical aspects of the subsurface conditions at this Site. The presence or implications of possible surface and/or subsurface contamination, including naturally occurring sources of contamination, are outside the terms of reference for this report. This report does not constitute a Phase II Environmental Site Assessment (ESA), nor does it constitute a contaminated material management plan. It is recommended that soil samples be collected prior to and/or during construction to support the disposal or re-use of excess soil generated from the site.

7.4 Effects of Construction Induced Vibration

Some of the construction operations (such as excavation, granular material compaction, depth foundation installation, etc.) will cause ground vibration on and off the Site. The vibrations will attenuate with distance from the source but may be felt at nearby structures. Assuming that excavation is carried out in accordance with the guidelines in this report, the magnitude of the vibrations may be less than that which could cause damage to the nearby structures or infrastructure in good condition but are anticipated to be felt at and within the adjacent nearby structures. Construction planning / scheduling and vibration monitoring should be considered,

especially if work within the underlying bedrock is to be undertaken and given the proximity to the existing residential development to the north.

7.5 Design Review and Construction Observation

The engagement of the services of the geotechnical consultant during construction is recommended to confirm that the subsurface conditions throughout the proposed site development and excavations do not materially differ from those given in the report, and that the construction activities do not adversely affect the intent of the design. The subgrade surfaces for the services and pavement construction should be inspected by experienced geotechnical personnel to ensure that suitable materials have been reached and properly prepared. The placing and compaction of earth fill and imported granular materials should be inspected to ensure that the materials used conform to the grading and compaction specifications.

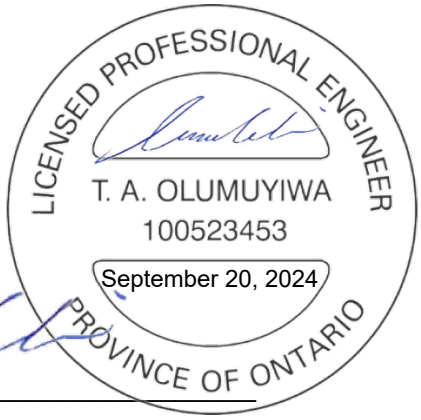
8.0 CLOSURE

We trust that this report meets your immediate requirements. If conditions that differ from those assumed in this preliminary geotechnical investigation report are encountered during construction, GEMTEC should be given the opportunity to review the recommendations presented herein.

If you have any questions or require additional information, please contact the undersigned.

Regards,

GEMTEC Consulting Engineers and Scientists Limited



Rafael Abdulla, M.Eng., P.Eng., PMP
Senior Geotechnical Engineer

Timi Olumuyiwa, M.Sc., P.Eng., PMP
Senior Geotechnical Engineer

APPENDIX A

Conditions and Limitations of This Report

GEMTEC
Consulting Engineers and Scientists

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 can not 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, fills 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.

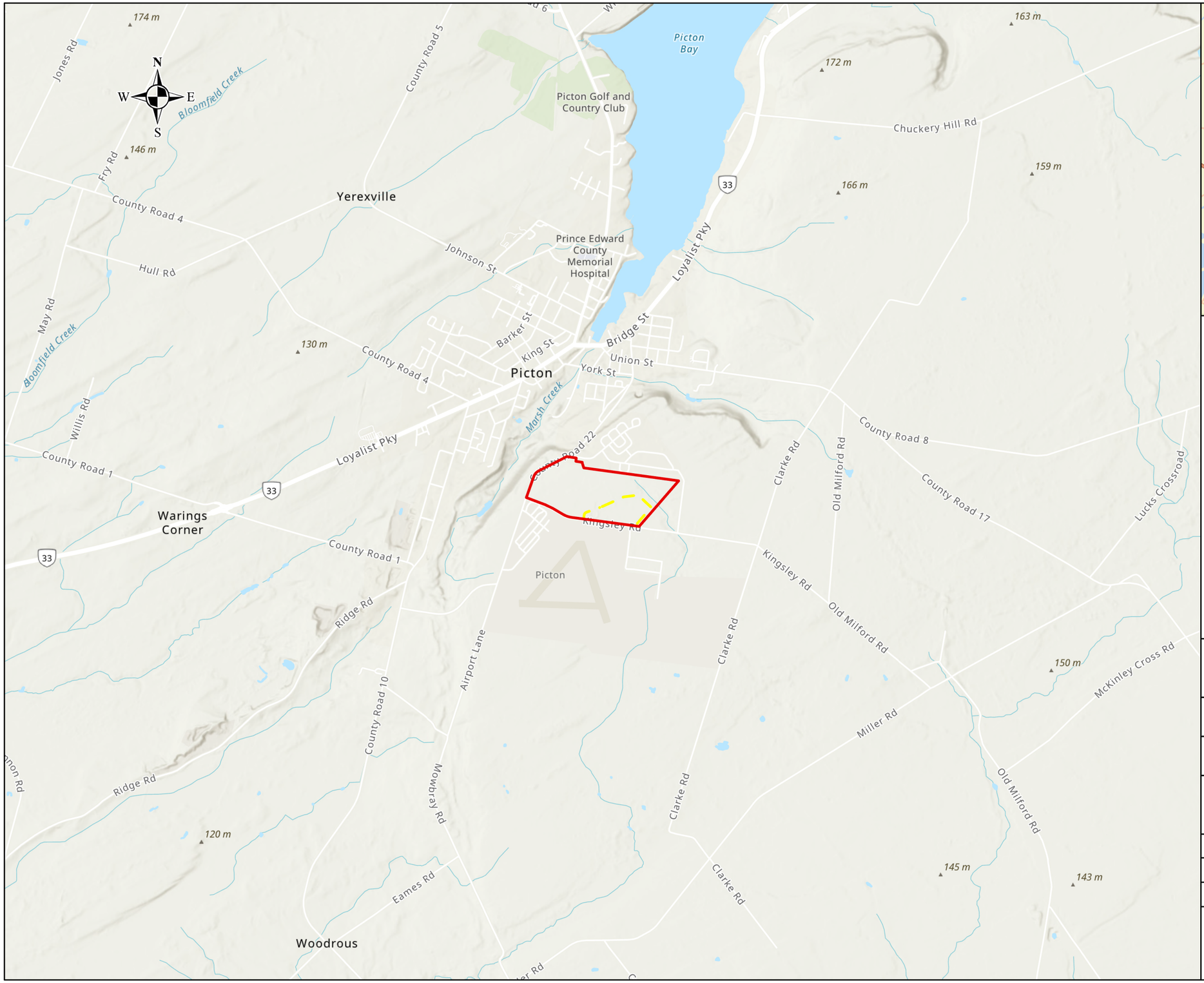
    During construction, GEMTEC should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not

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.

APPENDIX B

Site Location Plan
Borehole and Test Pit Location Plan



Legend

- APPROXIMATE VILLAGE C PROPERTY LINE
- APPROXIMATE SITE BOUNDARY

NOTES:

1. All locations approximate
2. Coordinate system: NAD 1983 UTM Zone 18N
3. Geographic dataset source: Ontario GeoHub.
4. Contains information licensed under the Open Government Licence – Ontario.
5. Service Layer Credits: World Topographic Map: Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada
World Street Map Background (Community Map of Canada): Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, NRCan, Parks Canada
World Hillshade: Esri, NASA, NGA, USGS, FEMA

Scale: 1:35,000

0 250 500 1,000 1,500 2,000 2,500 Meters

Drawing: SITE LOCATION PLAN

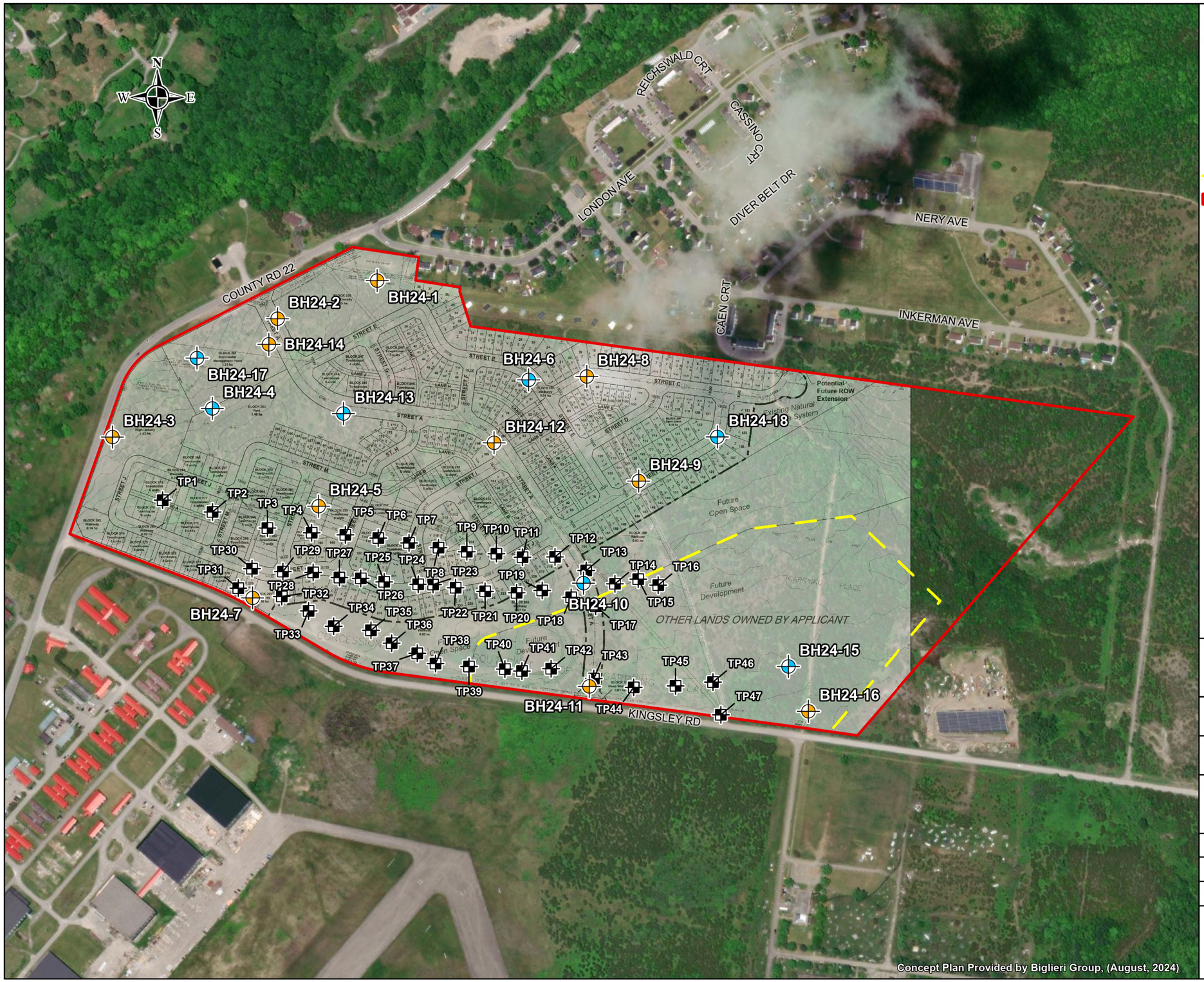
Client: PEC COMMUNITY PARTNERS INC.

Project: PRELIMINARY GEOTECHNICAL INVESTIGATION
VILLAGE A- BASE 31 AREA, PICTON,
COUNTY OF PRINCE EDWARD, ONTARIO

Drwn By:	S.J.	Chkd By:	R.A.
Project No.	103306.002	Revision No.	0
Date	SEPTEMBER 2024		**FIGURE 1**

GEMTEC
Consulting Engineers and Scientists
850 Champlain Ave Suite 101,
Oshawa, ON L1J 8C3
T: (289) 274-8476
www.gemtec.ca

Folder: N:\Projects\103300\103306.002\06_Civil Drafting\Sheets\Drawings\PrelimGeoTech\103306_002_PrelimGeoTech_Base31Area_R0_2024_08_30\



Legend

BH # BOREHOLE ID

TP # TEST PIT ID

APPROXIMATE BOREHOLE LOCATION

APPROXIMATE MONITORING WELL LOCATION

APPROXIMATE TEST PIT LOCATION

APPROXIMATE VILLAGE C PROPERTY LINE

APPROXIMATE SITE BOUNDARY

NOTES:

1. All locations approximate
2. Coordinate system: NAD 1983 UTM Zone 18N
3. Geographic dataset source: Ontario GeoHub.
4. Contains information licensed under the Open Government Licence – Ontario.
5. Service Layer Credits: World Imagery: Maxar

Scale: 1:5,000

0 50 100 200 300 400 Meters

Drawing: BOREHOLE AND TEST PIT LOCATION PLAN

Client: PEC COMMUNITY PARTNERS INC.

Project: PRELIMINARY GEOTECHNICAL INVESTIGATION
VILLAGE A- BASE 31 AREA, PICTON,
COUNTY OF PRINCE EDWARD, ONTARIO

Drwn By:	S.J.	Chkd By:	R.A.
Project No.	103306.002	Revision No.	0
Date	SEPTEMBER 2024		**FIGURE 2**

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850 Champlain Ave Suite 101,
Oshawa, ON L1J 8C3
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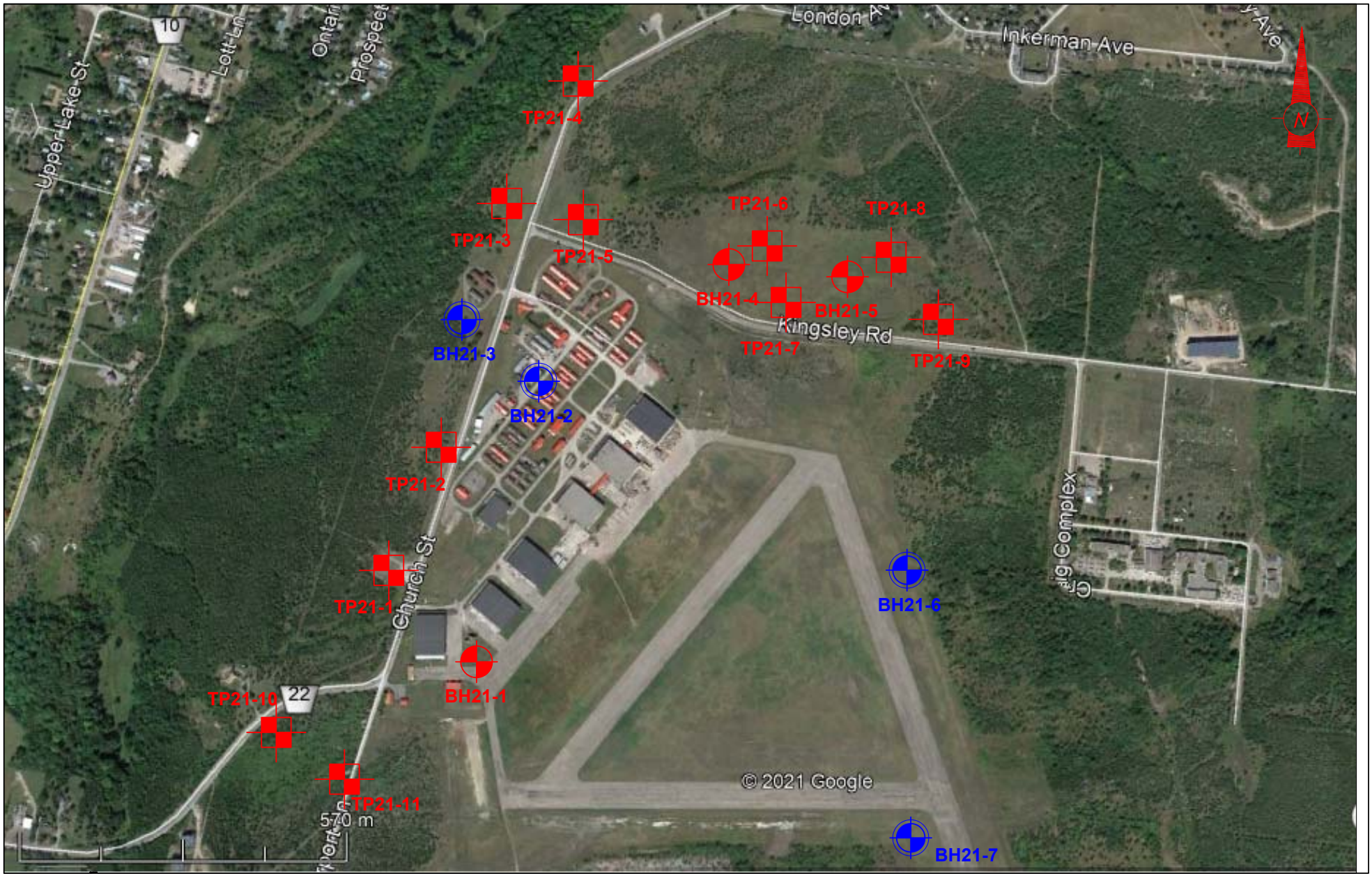
www.gemtec.ca

Folder: N:\Projects\103300\103306.002\06_Civil Drafting\Sheets\Drawings\PrelimGeoTech\103306_002_PrelimGeoTech_Base31Area_R0_2024_08_30\

APPENDIX C

Previous Geotechnical Reports
Palmer 2021 & Palmer 2023



LEGEND

- Test Pit Locations
- Borehole Locations
- Borehole/Monitoring Well Locations

Client:	**Tercot Acquisitions Limited**			Project No.: **1510436**	Drawing No.: **1**
Drawn:	**TP**	Approved:	**DT**	Title:	**Test Pit/Borehle/Monitoring Well Location Plan**
Date:	**July, 2021**	Scale:	**As Shown**	Project:	**Preliminary Geotechnical Investigation** **Picton Airport, Prince Edward County, ON**
Original Size:	**Letter**	Rev:	**N/A**	Palmer™	74 Berkeley Street Toronto, Ontario M5A 2W7

Palmer

LOG OF TEST PIT TP21-5

PROJECT: Preliminary Geotechnical Investigation - Picton Airport

CLIENT: Tercot Development Group

PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON

DATUM: N/A

TP LOCATION: See Test Pit Location Plan

Method: Backhoe Excavation

Diameter:

Date: Feb/17/2021

REF. NO.: 1510436

ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Ground Surface										
0.0	**TOPSOIL:** 50 mm										
0.1	**DISTURBED NATIVE (FILL):** organic clayey silt, trace sand, trace gravel, some rootlets, brown, wet		1	GS					55	5	
0.6	**FRAGMENTED BEDROCK:** limestone, grey		2	GS							
0.7	**END OF TEST PIT UPON REFUSAL ON LIMESTONE BEDROCK** 1. No groundwater accumulation upon completion of excavation.										

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

Palmer

LOG OF TEST PIT TP21-6

PROJECT: Preliminary Geotechnical Investigation - Picton Airport

CLIENT: Tercot Development Group

Method: Backhoe Excavation

PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON

Diameter:

REF. NO.: 1510436

DATUM: N/A

Date: Feb/17/2021

ENCL NO.: 6

TP LOCATION: See Test Pit Location Plan

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Ground Surface										
0.0	**TOPSOIL:** 100 mm										
0.1	**DISTURBED NATIVE (FILL):** sandy silt, some clay, trace gravel, some organics, trace rootlets, dark brown to brown, moist to wet		1	GS							
0.7	**END OF TEST PIT UPON REFUSAL ON LIMESTONE BEDROCK** 1. No groundwater accumulation upon completion of excavation.										

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

Palmer™

LOG OF TEST PIT TP21-7

PROJECT: Preliminary Geotechnical Investigation - Picton Airport
CLIENT: Tercot Development Group
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
DATUM: N/A
TP LOCATION: See Test Pit Location Plan

Method: Backhoe Excavation
Diameter:
Date: Feb/17/2021

REF. NO.: 1510436
ENCL NO.: 7

ELEV DEPTH (m)	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Ground Surface											
0.0	**TOPSOIL:** 100 mm											
0.1	**DISTURBED NATIVE (FILL):** sandy silt, some clay, trace gravel, trace rootlets, trace organics, dark brown to brown, moist to wet		1	GS					○			
0.5	**END OF TEST PIT UPON REFUSAL ON LIMESTONE BEDROCK** 1. No groundwater accumulation upon completion of excavation.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

Palmer

LOG OF TEST PIT TP21-8

PROJECT: Preliminary Geotechnical Investigation - Picton Airport

CLIENT: Tercot Development Group

Method: Backhoe Excavation

PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON

Diameter:

REF. NO.: 1510436

DATUM: N/A

Date: Feb/17/2021

ENCL NO.: 8

TP LOCATION: See Test Pit Location Plan

ELEV / DEPTH (m)	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Ground Surface							20 40 60 80 100	10 20 30			
0.0	**TOPSOIL:** 300 mm											
0.3	**DISTURBED NATIVE (FILL):** sandy silt, some clay, trace gravel, some organics, trace rootlets, dark brown, moist to wet		1	GS					○			
0.6	**DISTURBED NATIVE (FILL):** clayey silt, some sand, some gravel, trace organics, contains cobbles, dark brown to brown, moist		2	GS					○	50		44 11 29 16
1.2	**END OF TEST PIT UPON REFUSAL ON LIMESTONE BEDROCK** 1. No groundwater accumulation upon completion of excavation.											

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

Palmer™

LOG OF TEST PIT TP21-9

PROJECT: Preliminary Geotechnical Investigation - Picton Airport
CLIENT: Tercot Development Group
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
DATUM: N/A
TP LOCATION: See Test Pit Location Plan

Method: Backhoe Excavation
Diameter:
Date: Feb/17/2021

REF. NO.: 1510436
ENCL NO.: 9

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa)	WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Ground Surface											
0.0	**TOPSOIL:** 200 mm											
0.2	**DISTURBED NATIVE (FILL):** sandy silt, some clay, trace gravel, trace rootlets, brown, moist to wet		1	GS					o (approx. 21)			
0.5	**END OF TEST PIT UPON REFUSAL ON LIMESTONE BEDROCK** 1. No groundwater accumulation upon completion of excavation.											

Plot legend: DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100; SHEAR STRENGTH (kPa): O UNCONFINED, + FIELD VANE & Sensitivity, ● QUICK TRIAXIAL, × LAB VANE, 20 40 60 80 100. PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT W, LIQUID LIMIT W_L; WATER CONTENT (%) 10 20 30.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3, \times^3$: Numbers refer to Sensitivity; O ε=3% Strain at Failure

Palmer

LOG OF BOREHOLE BH21-4

PROJECT: Preliminary Geotechnical Investigation - Picton Airport

CLIENT: Tercot Acquisitions Limited

Method: Hollow Stem Augers/NQ Coring

PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON

Diameter: 205 mm/76 mm

REF. NO.: 1510436

DATUM: Geodetic

Date: Jun-02-2021

ENCL NO.: 15

BH LOCATION: See Borehole Location Plan

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"							GR SA SI CL
146.4	Ground Surface											
146.3 0.0	**TOPSOIL:** 100 mm											
0.1	**DISTURBED NATIVE (FILL):** gravelly silty clay, trace sand, trace rootlets, contain cobbles and boulders, brown, moist, hard		1	SS	70/ 175mm		146					
145.8 0.6	**ROCK CORING STARTS, REFER TO ROCK CORE LOG**						145					Auger grinding and spoon bouncing
1							144					
2							143					
3							142					
4												
5												
141.2 5.2	**END OF BOREHOLE** Notes: 1. Borehole was open upon completion of drilling.											

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

Palmer

LOG OF ROCK CORE BH21-4

PROJECT: Preliminary Geotechnical Investigation - Picton Airport

CLIENT: Tercot Acquisitions Limited | Method: Hollow Stem Augers/NQ Coring | REF. NO.: 1510436

LOCATION: 343 County Road 22, Picton, Prince Edward County, ON | Diameter: 205 mm/76 mm | ENCL NO.: 15

DATUM: Geodetic | Date: Jun-02-2021

BH LOCATION: See Borehole Location Plan

(m) ELEV / DEPTH	ROCK DESCRIPTION	GROUND WATER CONDITIONS	CORE SAMPLE NUMBER	CORE SAMPLE SIZE	TOTAL CORE RECOVERY (%)	SOLID CORE RECOVERY (%)	HARD LAYER (%)	RQD (%)	FRACTURE INDEX (per 0.3 m)	DISCONTINUITIES	Weathering Index	HYDRAULIC CONDUCTIVITY (cm/sec)	POINT LOAD TEST UCS AXIAL (MPa)*	POINT LOAD TEST UCS DIAMETRAL (MPa)*	UNIAXIAL COMPRESSION (MPa)	DENSITY (g/cm^3) E (GPa)
145.8	Rock Surface															
145.8 / 0.0	**LIMESTONE** moderately weathered with cobbles and boulders, medium strong to very strong, grey								14	Gravel Layer/Fragment Zone: 0.56m - 0.64m Fragment Zone: 0.87m - 0.97m 1.27m - 1.35m	W3-W2					
0.6	**LIMESTONE** slightly weathered to fresh, strong to very strong, grey								11							
1			1	NQ	100	82	N/A	47	9							
									2							
2 / 144.3									2							
2.1									3							
									5							
3			2	NQ	100	100	N/A	75	2		W1		104.6	114.2		
									4							
142.8									2							
3.6									1							
4									4							
			3	NQ	100	100	N/A	64	4							
									3							
5 / 141.2									4							
5.2	**END OF BOREHOLE** Notes: 1. Borehole was open upon completion of drilling.															

Weathering Index: W1-Fresh, W2-Slightly weathered, W3-Moderately weathered, W4-Highly weathered, W5-Completely weathered

Diangle to the core axis

E = Modulus of Elasticity

*: UCS [Mpa] ≈ 24 $I_{S(50)}$

Palmer

LOG OF BOREHOLE BH21-5

PROJECT: Preliminary Geotechnical Investigation - Picton Airport

CLIENT: Tercot Acquisitions Limited

Method: Hollow Stem Augers/NQ Coring

PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON

Diameter: 205 mm/76 mm

REF. NO.: 1510436

DATUM: Geodetic

Date: Jun-02-2021

ENCL NO.: 16

BH LOCATION: See Borehole Location Plan

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa): ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE & Sensitivity, × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
145.9	Ground Surface										
145.8 0.0	**TOPSOIL:** 100 mm										
0.1	**DISTURBED NATIVE (FILL):** gravelly silty clay, trace sand, trace rootlets, contain cobbles and boulders, brown, moist, hard		1	SS	56/ 275mm						
145.4											
0.6	**ROCK CORING STARTS, REFER TO ROCK CORE LOG**										Auger grinding and spoon bouncing
1							145				
2							144				
3							143				
4							142				
5 140.9							141				
5.1	**END OF BOREHOLE** Notes: 1. Borehole was open upon completion of drilling.										

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

Palmer

LOG OF ROCK CORE BH21-5

PROJECT: Preliminary Geotechnical Investigation - Picton Airport

CLIENT: Tercot Acquisitions Limited

LOCATION: 343 County Road 22, Picton, Prince Edward County, ON

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan

Method: Hollow Stem Augers/NQ Coring

Diameter: 205 mm/76 mm

Date: Jun-02-2021

REF. NO.: 1510436

ENCL NO.: 16

(m) ELEV / DEPTH	ROCK DESCRIPTION	GROUND WATER CONDITIONS	CORE SAMPLE NUMBER	CORE SAMPLE SIZE	TOTAL CORE RECOVERY (%)	SOLID CORE RECOVERY (%)	HARD LAYER (%)	RQD (%)	FRACTURE INDEX (per 0.3 m)	DISCONTINUITIES	Weathering Index	HYDRAULIC CONDUCTIVITY (cm/sec)	POINT LOAD TEST UCS AXIAL (MPa)*	POINT LOAD TEST UCS DIAMETRAL (MPa)*	UNIAXIAL COMPRESSION (MPa)	DENSITY (g/cm^3) E (GPa)
145.4	Rock Surface															
0.6	**LIMESTONE** moderately weathered with cobbles and boulders, medium strong to very strong, grey								>25	Gravel Layer/Fragment Zone: 0.56m - 0.89m	W3-W2					
145.0																
0.9	**LIMESTONE** slightly weathered to fresh, strong to very strong, grey								10							
1			1	NQ	100	73	N/A	38	4							
									1							
144.1									1							
1.9									2							
2									2							
			2	NQ	100	100	N/A	91	5		W1				89.1	
3									1							
									2							
142.4																
3.5									2				109.8	88.4		
4									3							
			3	NQ	100	100	N/A	72	3							
									2							
5									1							
140.9																
5.1	**END OF BOREHOLE** Notes: 1. Borehole was open upon completion of drilling.															

Weathering Index: W1-Fresh, W2-Slightly weathered, W3-Moderately weathered, W4-Highly weathered, W5-Completely weathered

Angle to the core axis

E = Modulus of Elasticity

*: UCS [Mpa] ≈ 24 $I_{S(50)}$

871 Equestrian Court, Unit 1, Oakville ON L6L 6L7
Tel: 647-795-8153 | www.pecg.ca

Memorandum

Date: November 27, 2023
Project #: 1510458

To: Mike Pearsell and Julia Risi
SCS Consulting Group Ltd.
30 Centurian Drive, Suite 100, Markham, ON, L3R 8B8

From: Ted Ou and Matthew St. Denis

Re: Test Pit Observation
Picton Airport/Base 31

1. Introduction

Palmer is pleased to provide SCS Consulting Group Ltd. with our memorandum for test pit observation at the project Site located at 343 County Rd 22, in the county of Prince Edward, Ontario.

It is understood that the proposed development will consist of low rise and multi-storey buildings. The purpose of the test pit is to confirm bedrock depth in the Revitalization area to support the upcoming works as well as in the proposed Village A development area north of Kingsley Road to support the design of this future area, by means of twelve (12) test pits.

2. Test Pit Observation

The field work was carried out on Nov 15, 2023 by JCB 3CX rubber tire backhoe, with an 18inch bucket, provided by the client, during which time twelve (12) test pits (TP1 to TP12) were advanced at the locations shown on the **Test Pit Location Plan**, Drawing 1. The test pits were excavated to refusal on sound bedrock at depths ranging from 0.5 to 1.2m below existing ground surface.

Nine (9) test pits were conducted within the Revitalization area. Three (3) test pits were conducted within the Village A area, and the soil conditions were observed by the bidder and the engineers/technician from SCS and Palmer. The test pit locations were provided by the client and the test pit locations plotted on the Test Pit Location Plan (Drawing 1) were based on the measurement of site features and should be considered as approximate.

During the test pit excavation, fractured rock debris were observed at throughout the site as shown in the Photos in **Appendix A**. Due to the limit of excavation method during the excavation, all test pits were terminated at the sound bedrock surface. Additional heavy duty excavator equipped with a hoe ram or rock bucket were not available on site for further advancement into bedrock.

Table 1. Observations at Test Pits

Test Pit	Soil Obersvations
TP1	0 - 0.3m: Top soil 0.3 – 0.9m: Brown sandy silt mix with rock debris, moist 0.9m: Bedrock
TP2	0 - 0.3m: Top soil 0.3 – 1.2 m: Brown sandy silt mix with rock debris, moist 1.2m: Bedrock
TP3	0 - 0.3m: Top soil 0.3 – 0.8m: Brown sandy silt mix with rock debris, moist 0.8m: Bedrock
TP4	0 - 0.4m: Top soil 0.4 – 0.9m: Brown sandy silt mix with rock debris, moist 0.9m: Bedrock
TP5	0 - 0.4m: Top soil 0.4 – 0.7m: Brown sandy silt mix with rock debris, moist 0.7m: Bedrock
TP6	0 - 0.2m: Top soil 0.2 – 0.6m: Brown sandy silt mix with rock debris, moist 0.6m: Bedrock
TP7	0 - 0.2m: Top soil 0.2 – 0.7m: Brown sandy silt mix with rock debris, moist 0.7m: Bedrock
TP8	0 - 0.4m: Granular Fill 0.4 – 0.6m: Asphalt mix with granular fill 0.6 – 0.8m: Brown sandy silt mix with rock debris, moist 0.8m: Bedrock
TP9	0 - 0.4m: Granular Fill 0.4 – 0.6m: Asphalt mix with granular fill 0.6 – 0.85m: Brown sandy silt mix with rock debris, moist 0.85m: Bedrock
TP10 (TP#1 in Village A)	0 - 0.4m: Top soil 0.4 – 0.5m: Brown sandy silt mix with rock debris, moist 0.5m: Bedrock
TP11(TP#3 in Village A)	0 - 0.4m: Top soil 0.4 – 0.6m: Brown sandy silt mix with rock debris, moist 0.6m: Bedrock
TP12(TP#5 in Village A)	0 - 0.4m: Top soil 0.4 – 0.8m: Brown sandy silt mix with rock debris, moist 0.8m: Bedrock

3. Certification

We trust that the information contained in this memorandum is satisfactory. Should you have any questions, please do not hesitate to contact this office.

This memorandum was prepared and reviewed by the undersigned:

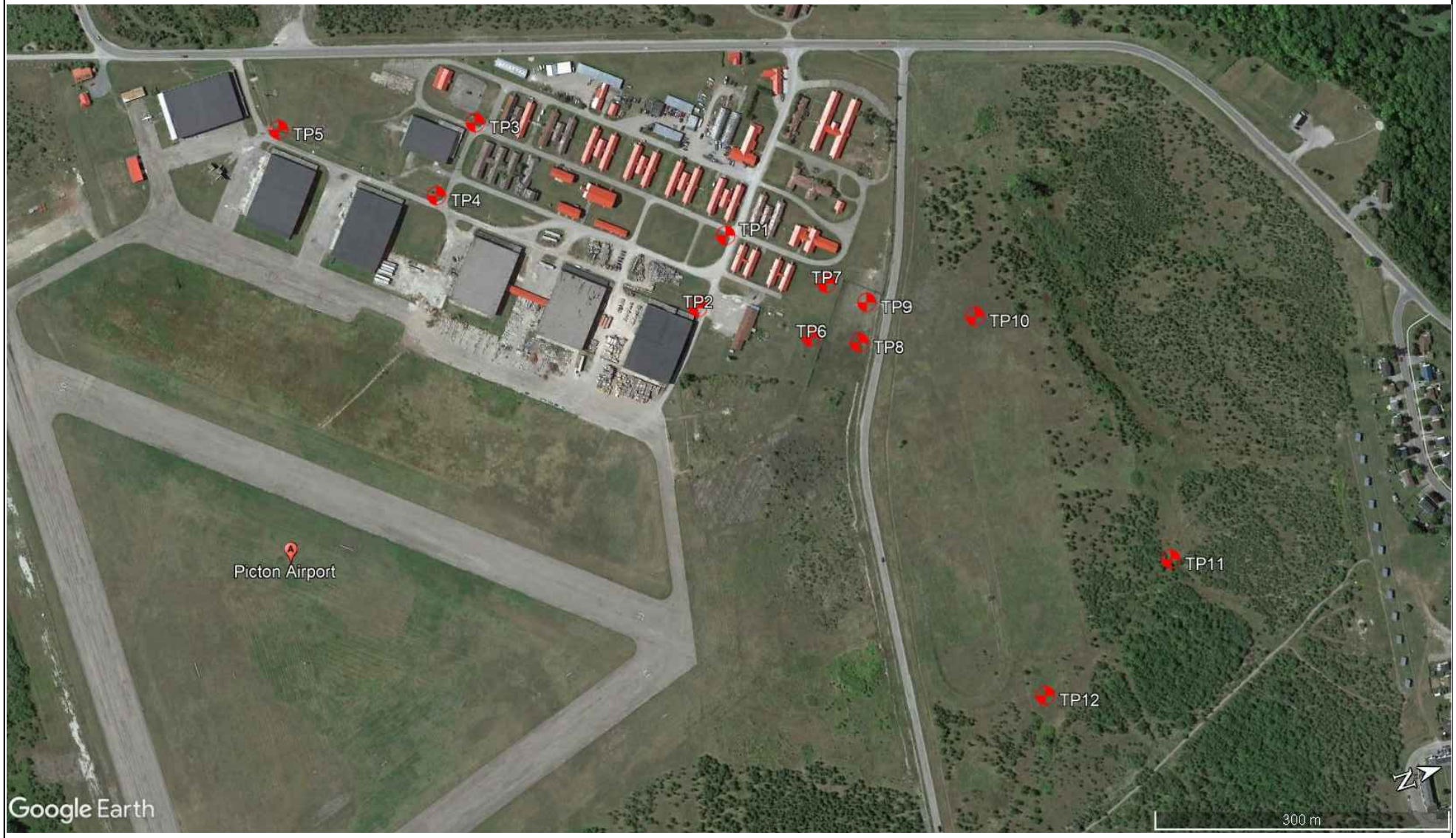
Prepared By:

Ted Ou, M.Sc, P.Eng, PMP.
Geotechnical Project Manager

Reviewed By:

Matthew D. St Denis., P.Eng.
Team Lead, Geotechnical Engineering

Drawings



LEGEND

Test Pit Location

Client:				Project No.: **1510458**	Drawing No.: **1**
Drawn: **TO**		Approved: **MDS**		Title: **Test Pit Location Plan**	
Date: **Nov, 2023**		Scale: **As Shown**		Project: **Test Pit Observation** **Picton Airport, Prince Edward County, ON**	
Original Size: **Letter**		Rev: **N/A**		Palmer PART OF SLR	871 Equestrain Court, Unit 1 Oakville, Ontario L6L 6L7

Appendix A

Site Photos

Test Pit 1

Test pit 2

Test pit 3

Test pit 4

Test pit 5

Test pit 6

Test pit 7

Test pit 8

Test pit 9

Test pit 10

Test pit 11

Test pit 12

APPENDIX D

Abbreviations and Terminology Used on Records of Boreholes
Record of Borehole Sheets BH24-1 to BH24-18

ABBREVIATIONS AND TERMINOLOGY USED ON RECORDS OF BOREHOLES AND TEST PITS

SAMPLE TYPES	
AS	Auger sample
CA	Casing sample
CS	Chunk sample
BS	Borros piston sample
GS	Grab sample
MS	Manual sample
RC	Rock core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled open shelby tube
TP	Thin-walled piston shelby tube
WS	Wash sample

SOIL TESTS	
w	Water content
PL, w_p	Plastic limit
LL, w_L	Liquid limit
C	Consolidation (oedometer) test
D_R	Relative density
DS	Direct shear test
G_S	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
UC	Unconfined compression test
γ	Unit weight

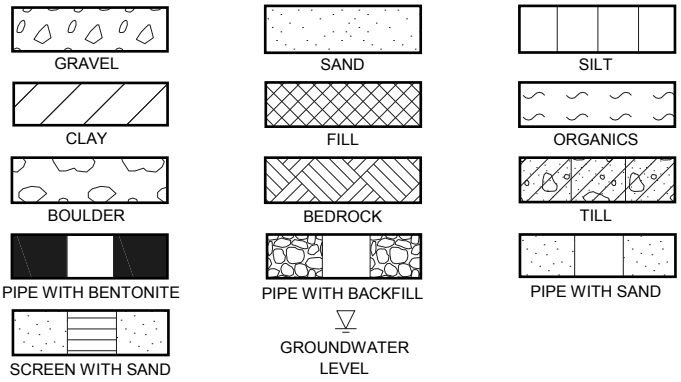
PENETRATION RESISTANCE

Standard Penetration Resistance, N
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 millimetres (30 in.) required to drive a 50 mm split spoon sampler for a distance of 300 mm (12 in.). For split spoon samples where less than 300 mm of penetration was achieved, the number of blows is reported over the sampler penetration in mm.

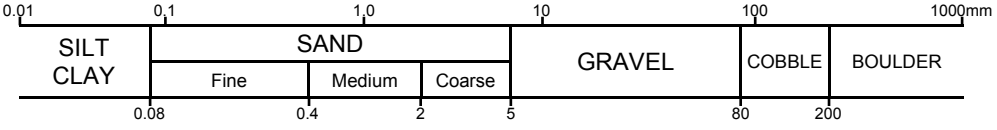
Dynamic Penetration Resistance
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive a 50 mm (2 in.) diameter 60° cone attached to 'A' size drill rods for a distance of 300 mm (12 in.).

WH	Sampler advanced by static weight of hammer and drill rods
WR	Sampler advanced by static weight of drill rods
PH	Sampler advanced by hydraulic pressure from drill rig
PM	Sampler advanced by manual pressure

COHESIONLESS SOIL Compactness		COHESIVE SOIL Consistency	
SPT N-Values	**Description**	**Cu, kPa**	**Description**
0-4	Very Loose	0-12	Very Soft
4-10	Loose	12-25	Soft
10-30	Compact	25-50	Firm
30-50	Dense	50-100	Stiff
>50	Very Dense	100-200	Very Stiff
		>200	Hard

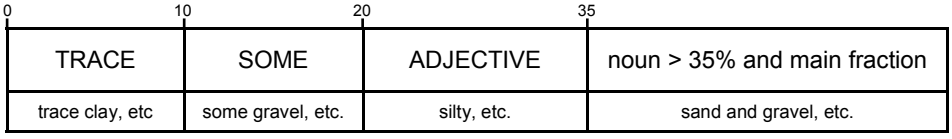


GRAIN SIZE



DESCRIPTIVE TERMINOLOGY

(Based on the CANFEM 4th Edition)



RECORD OF BOREHOLE : BH24-1

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 26 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger; Hollow Stem Auger (152mm OD)	Ground Surface		145.37						
		TOPSOIL (~75mm thick)		0.08	1A	SS				
		(SM) SILTY SAND, some gravel; grey, oxidation stains, rock fragment; non-cohesive, moist, very dense		145.07 0.30	1B	SS	203	50/0.08		
1		- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	0	50/0.03		
				143.82	3	SS	0	50/0.03		
2	HQ Coring	End of Augering BEDROCK cored (approximately 1.6 m to 4.7 m depths) Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)		1.55	RC-1	RC	1524	TCR = 100%, SCR = 91%, RQD = 87%		
3										
4					RC-2	RC	1524	TCR = 100%, SCR = 83%, RQD = 90%		
				140.70						
5		End of Borehole Notes: 1. Borehole open and dry upon completion of drilling. 2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.		4.67						
6										
7										
8										
9										
10										

SOIL PROFILE | SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

GEMTEC
Consulting Engineers and Scientists

LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-2

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 30 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA / WATER CONTENT, %	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Hollow Stem Auger (152mm OD)	Ground Surface		143.61							
		TOPSOIL (~50mm thick)		0.05	1A	SS					
		(SM) SILTY SAND, some gravel; grey, rock fragment; non-cohesive, moist, very dense		143.31 0.30	1B	SS	203	50/0.1③			
1		- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	25	50/0.0③			
				142.06	3	SS	25	50/0.0③			
		End of Augering		1.55							
2	HQ Coring	BEDROCK cored (approximately 1.6 m to 7.7 m depths): Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)			RC-1	RC	1524	TCR = 100%, SCR = 17%, RQD = 0%			
3											
4					RC-2	RC	1524	TCR = 100%, SCR = 38%, RQD = 0%			
5					RC-3	RC	1524	TCR = 100%, SCR = 83%, RQD = 22%			
6											
7					RC-4	RC	1524	TCR = 100%, SCR = 98%, RQD = 93%			
				135.94							
		End of Borehole		7.67							
8		Notes: 1. Borehole open and dry upon completion of drilling. 2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.									
9											
10											

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

GEMTEC
Consulting Engineers and Scientists

LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-3

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 29 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA / WATER CONTENT, %	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Hollow Stem Auger (152mm OD)	Ground Surface		142.49							
		TOPSOIL (~75mm thick)		0.08	1A	SS					
		(SM) SILTY SAND, some gravel; grey, oxidation stains, rock fragments; non-cohesive, moist, compact to very dense		142.19 0.30	1B	SS	254	19			
1		- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	25	50/0.03			
				140.94	3	SS	0	50/0.03			
		End of Augering		1.55							
2	HQ Coring	BEDROCK cored (approximately 1.6 m to 6.2 m depths)									
		Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)			RC-1	RC	1524	TCR = 100%, SCR = 97%, RQD = 83%			
3											
					RC-2	RC	1524	TCR = 100%, SCR = 92%, RQD = 85%			
4											
5					RC-3	RC	1524	TCR = 100%, SCR = 97%, RQD = 90%			
6				136.32							
		End of Borehole		6.17							
		Notes:									
7		1. Borehole open and dry upon completion of drilling.									
		2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.									
8											
9											
10											

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

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LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-4

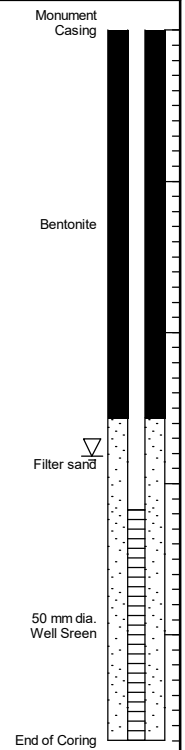
CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 29 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
		Ground Surface		143.60					
0	Power Auger / Hollow Stem Auger (152mm OD)	TOPSOIL (~125mm thick)		0.13	1A	SS			
		(SM) SILTY SAND and GRAVEL; grey, rock fragments; non-cohesive, moist, compact to very dense		143.30 0.30	1B	SS	356	21	
		- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	76	50/0.08	MH
1				142.05	3	SS	0	50/0.03	
	HQ Coring	End of Augering BEDROCK cored (approximately 1.7 m to 4.7 m depths) Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)		1.55	RC-1	RC	1524	TCR = 100%, SCR = 100%, RQD = 100%	
2									
3									
4					RC-2	RC	1524	TCR = 100%, SCR = 100%, RQD = 95%	UCS
		End of Borehole		138.90 4.70					
5		Notes: 1. Borehole open and dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling. 3. Groundwater level measured in monitoring well at approximately 2.8 mbgs (Elev. 140.8 m) on August 13, 2024.							
6									
7									
8									
9									
10									

SHEAR STRENGTH (Cu), kPA
● PENETRATION RESISTANCE (N), BLOWS/0.3m
+ NATURAL ⊕ REMOULDED
▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
WATER CONTENT, %
W_P W W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/08/13	2.8 ▽	140.8

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CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-5

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 23 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger / Hollow Stem Auger (152mm OD)	Ground Surface		146.60						
		TOPSOIL (~125mm thick)			1A	SS				
		(GP) GRAVEL, some sand, some fines; grey, rock fragments; non-cohesive, moist, very dense		0.13 146.09	1B	SS	152	50/0.3		
1		- Auger grinding between depths of approximately 0.5 m (start of weathered BEDROCK) and 1.6 m		0.51	2	SS	0	50/0.1		
				145.05	3	SS	0	50/0.03		
2	HQ Coring	End of Augering BEDROCK cored (approximately 1.5 m to 4.6 m depths) Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)		1.55	RC-1	RC	1448	TCR = 95%, SCR = 83%, RQD = 83%		
3										
4					RC-2	RC	1524	TCR = 100%, SCR = 97%, RQD = 87%		
				142.00						
5		End of Borehole Notes: 1. Borehole open and dry upon completion of drilling. 2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.		4.60						
6										
7										
8										
9										
10										

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

GEMTEC
Consulting Engineers and Scientists

LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-6

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

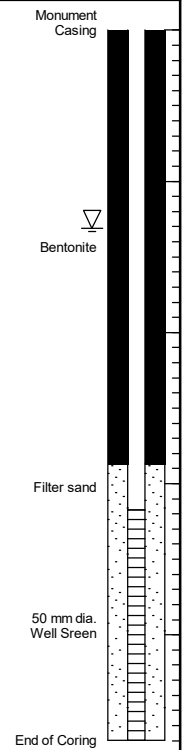
SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 26 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		146.45				
0	Power Auger / Hollow Stem Auger (152mm OD)	TOPSOIL (~100mm thick)			1A	SS		
		(SM) SILTY SAND, some gravel; grey, rock fragments; non-cohesive, moist, very dense		0.10 146.15	1B	SS	127	50/0.1
		- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m		0.30	2	SS	0	50/0.03
1				144.90	3	SS	0	50/0.03
	HQ Coring	End of Augering BEDROCK cored (approximately 1.7 m to 4.7 m depths) Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)		1.55	RC-1	RC	1524	TCR = 100%, SCR = 100%, RQD = 88%
2								
3								
4					RC-2	RC	1524	TCR = 100%, SCR = 100%, RQD = 100%
		End of Borehole Notes: 1. Borehole open and dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling. 3. Groundwater level measured in monitoring well at approximately 1.3 mbgs (Elev. 145.1 m) on August 13, 2024.		141.75 4.70				
5								
6								
7								
8								
9								
10								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: NATURAL, REMOULDED
WATER CONTENT, %: W_P, W, W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING: UCS

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/08/13	1.3 ▽	145.1

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Consulting Engineers and Scientists

LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-7

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 22 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger	Ground Surface		146.64						
		TOPSOIL (~175mm thick)		0.18	1A	SS				
		(SM) SILTY SAND, some gravel; grey, rock fragments; non-cohesive, moist, very dense		146.26 0.38	1B	SS	305	50/0.08		
1	Hollow Stem Auger (152mm OD)	- Auger grinding between depths of approximately 0.4 m (start of weathered BEDROCK) and 1.6 m			2	SS	0	50/0.03		
				145.09	3	SS	0	50/0.03		
2	HQ Coring	End of Augering BEDROCK cored (approximately 1.7 m to 4.7 m depths) Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)		1.55	RC-1	RC	1524	TCR = 100%, SCR = 97%, RQD = 90%		
3										
4					RC-2	RC	1524	TCR = 100%, SCR = 97%, RQD = 85%		
				141.94						
5		End of Borehole Notes: 1. Borehole open and dry upon completion of drilling. 2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.		4.70						
6										
7										
8										
9										
10										

SOIL PROFILE | SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % — W_P W W_L
10 20 30 40 50 60 70 80 90

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Consulting Engineers and Scientists

LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-8

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 24 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
0	Power Auger	Ground Surface		147.00				
		TOPSOIL (~75mm thick)		0.08	1A	SS		
		(SM) SILTY SAND and GRAVEL; grey, rock fragments; non-cohesive, moist, dense to very dense		146.70 0.30	1B	SS	356	32
1	Hollow Stem Auger (152mm OD)	- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	0	50/0.03
				145.45	3	SS	0	50/0.03
		End of Augering BEDROCK cored (approximately 1.5 m to 4.6 m depths) Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)		1.55	RC-1	RC	1524	TCR = 100%, SCR = 97%, RQD = 97%
2								
3	HQ Coring				RC-2	RC	1524	TCR = 100%, SCR = 97%, RQD = 88%
4				142.40				
		End of Borehole Notes: 1. Borehole open and dry upon completion of drilling. 2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.		4.60				
5								
6								
7								
8								
9								
10								

SOIL PROFILE | SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

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Consulting Engineers and Scientists

LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-9

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 24 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger	Ground Surface		146.88						
		BALLAST (~75mm thick)		0.08	1A	SS				
		(SM) SILTY SAND and GRAVEL; grey, oxidation stains, rock fragments; non-cohesive, moist, compact to very dense		146.48 0.40	1B	SS	457	17		
1	Hollow Stem Auger (152mm OD)	- Auger grinding between depths of approximately 0.4 m (start of weathered BEDROCK) and 1.6 m			2	SS	25	50/0.03		
		End of Augering		145.33 1.55	3	SS	0	50/0.03		
2	HQ Coring	BEDROCK cored (approximately 1.6 m to 4.6 m depths)			RC-1	RC	1524	TCR = 100%, SCR = 90%, RQD = 72%	UCS	
		Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)								
3										
4					RC-2	RC	1524	TCR = 100%, SCR = 97%, RQD = 83%		
		End of Borehole		142.23 4.65						
5		Notes:								
		1. Borehole open and dry upon completion of drilling.								
6		2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.								
7										
8										
9										
10										

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

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LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-10

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

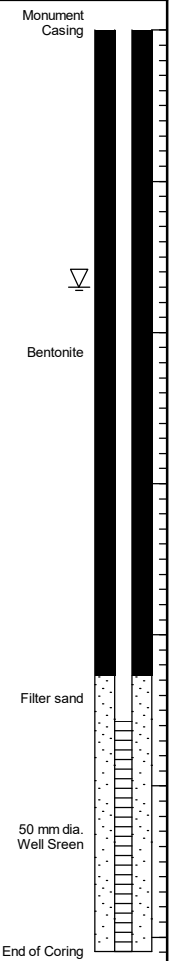
SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 23 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
0	Power Auger (Hollow Stem Auger (152mm OD))	Ground Surface		145.43				
		TOPSOIL (~125mm thick)			1A	SS		
		(SM) SILTY SAND, some gravel; grey, rock fragments; non-cohesive, moist, very dense		0.13	1B	SS	203	50/0.13
				144.83				
1		- Auger grinding between depths of approximately 0.6 m (start of weathered BEDROCK) and 1.6 m		0.60	2	SS	0	50/0.05
				143.88	3	SS	0	50/0.03
		End of Augering		1.55				
2	HQ Coring	BEDROCK cored (approximately 1.6 m to 6.2 m depths)						
		Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)			RC-1	RC	1524	TCR = 100%, SCR = 100%, RQD = 100%
3								
4					RC-2	RC	1524	TCR = 100%, SCR = 100%, RQD = 93%
5					RC-3	RC	1524	TCR = 100%, SCR = 93%, RQD = 80%
6				139.21				
		End of Borehole		6.22				
7		Notes: 1. Borehole open and dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling. 3. Groundwater level measured in monitoring well at approximately 1.7 mbgs (Elev. 143.7 m) on August 13, 2024.						
8								
9								
10								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: NATURAL, REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/08/13	1.7 ▽	143.7

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LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-11

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 23 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		143.65						
0	Power Auger Hollow Stem Auger (152mm OD)	TOPSOIL (~125mm thick)			1A	SS				
		(SM) SILTY SAND and GRAVEL; grey, rock fragments; non-cohesive, moist, dense to very dense		0.13	1B	SS	203	50/0.13		
				143.05						
		- Auger grinding between depths of approximately 0.6 m (start of weathered BEDROCK) and 1.6 m		0.60	2	SS	356	32	MH	
1										
				142.10	3	SS	25	50/0.03		
		End of Augering		1.55						
2	HQ Coring	BEDROCK cored (approximately 1.7 m to 6.2 m depths)								
		Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)			RC-1	RC	1524	TCR = 100%, SCR = 100%, RQD = 95%		
3										
					RC-2	RC	1524	TCR = 100%, SCR = 100%, RQD = 90%		
4										
5					RC-3	RC	1524	TCR = 100%, SCR = 97%, RQD = 92%		
6				137.43						
		End of Borehole		6.22						
		Notes:								
		1. Borehole open and dry upon completion of drilling.								
7		2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.								
8										
9										
10										

SOIL PROFILE | SAMPLES | PENETRATION RESISTANCE (N), BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m | SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED | WATER CONTENT, % W_P W W_L | 10 20 30 40 50 60 70 80 90

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LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-12

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 24 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA / WATER CONTENT, %	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Hollow Stem Auger (152mm OD)	Ground Surface		146.00							
		TOPSOIL (~50mm thick)		0.05	1A	SS					
		(SM) SILTY SAND and GRAVEL; grey, rock fragments; non-cohesive, moist, very dense		145.70 0.30	1B	SS	127	50/0.05			
1		- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	0	50/0.03			
				144.45	3	SS	0	50/0.03			
	HQ Coring	End of Augering		1.55							
2		BEDROCK cored (approximately 1.7 m to 6.2 m depths)									
		Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)			RC-1	RC	1524	TCR = 100%, SCR = 98%, RQD = 98%			
3											
4					RC-2	RC	1524	TCR = 100%, SCR = 97%, RQD = 93%			
5					RC-3	RC	1524	TCR = 100%, SCR = 100%, RQD = 100%			
6				139.78							
		End of Borehole		6.22							
7		Notes:									
		1. Borehole open and dry upon completion of drilling.									
		2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.									
8											
9											
10											

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

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Consulting Engineers and Scientists

LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-13

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 25 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA / WATER CONTENT, %	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Hollow Stem Auger (152mm OD)	Ground Surface		145.82						MH	Monument Casing
		TOPSOIL (~50mm thick)		0.05	1A	SS					
		(SM) gravelly SILTY SAND; grey, rock fragments; non-cohesive, moist, very dense		145.52 0.30	1B	SS	127	50/0.08			
1		- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	25	50/0.03			
				144.27	3	SS	0	50/0.03			
		End of Augering		1.55							
2	HQ Coring	BEDROCK cored (approximately 1.7 m to 6.2 m depths)									Bentonite
		Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)			RC-1	RC	1524	TCR = 100%, SCR = 97%, RQD = 92%			
3											
4					RC-2	RC	1524	TCR = 100%, SCR = 90%, RQD = 70%			Filter sand
5					RC-3	RC	1524	TCR = 100%, SCR = 97%, RQD = 93%			50 mm dia. Well Sreen
6				139.60							End of Coring
		End of Borehole		6.22							
7		Notes:									
		1. Borehole open and dry upon completion of drilling.									
		2. Monitoring well installed as shown upon completion of drilling.									
8		3. Groundwater level measured in monitoring well at approximately 1.2 mbgs (Elev. 144.7 m) on August 13, 2024.									
9											
10											

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/08/13	1.2 ▽	144.7

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LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-14

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 25 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA / WATER CONTENT, %	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Hollow Stem Auger (152mm OD)	Ground Surface		143.60							
		TOPSOIL (~75mm thick)		0.08	1A	SS					
		(SM) SILTY SAND and GRAVEL; grey, rock fragments; non-cohesive, moist, very dense		143.30 0.30	1B	SS	152	50/0.08			
1		- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	25	50/0.03			
				142.05 1.55	3	SS	0	50/0.03			
2	HQ Coring	End of Augering BEDROCK cored (approximately 1.6 m to 6.1 m depths) Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)			RC-1	RC	1524	TCR = 100%, SCR = 75%, RQD = 60%			
3											
4					RC-2	RC	1524	TCR = 100%, SCR = 77%, RQD = 67%			
5					RC-3	RC	1524	TCR = 100%, SCR = 82%, RQD = 75%			
6				137.45 6.15							
		End of Borehole Notes: 1. Borehole open and dry upon completion of drilling. 2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.									
7											
8											
9											
10											

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

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Consulting Engineers and Scientists

LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-15

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 30 2024

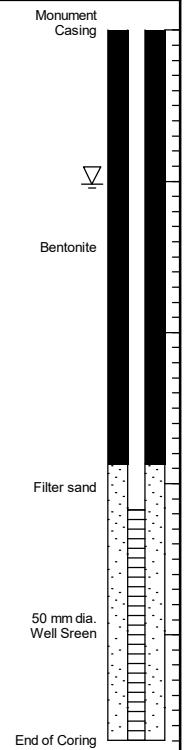
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		143.50				
0	Power Auger / Hollow Stem Auger (152mm OD)	TOPSOIL (~75mm thick)		0.08	1A	SS		
		(SM) SILTY SAND and GRAVEL; grey, rock fragments; non-cohesive, moist, very dense		143.20 0.30	1B	SS	152	50/0.13
		- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	25	50/0.03
1				141.95	3	SS	0	50/0.03
	HQ Coring	End of Augering		1.55				
		BEDROCK cored (approximately 1.7 m to 4.7 m depths)						
2		Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)			RC-1	RC	1524	TCR = 100%, SCR = 100%, RQD = 100%
3								
4					RC-2	RC	1524	TCR = 100%, SCR = 100%, RQD = 95%
				138.80				
		End of Borehole		4.70				
5		Notes:						
		1. Borehole open and dry upon completion of drilling.						
		2. Monitoring well installed as shown upon completion of drilling.						
6		3. Groundwater level measured in monitoring well at approximately 1.0 mbgs (Elev. 142.5 m) on August 13, 2024.						
7								
8								
9								
10								

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/08/13	1.0 ▽	142.5

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LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-16

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 24 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		142.98				
0	Power Auger / Hollow Stem Auger (152mm OD)	TOPSOIL (~125mm thick)			1A	SS		
		(SM) SILTY SAND and GRAVEL; grey, rock fragments; non-cohesive, moist, very dense		0.13 142.58 0.40	1B	SS	203	50/0.08
1		- Auger grinding between depths of approximately 0.4 m (start of weathered BEDROCK) and 1.6 m			2	SS	25	50/0.03
				141.43	3	SS	0	50/0.03
	HQ Coring	End of Augering BEDROCK cored (approximately 1.7 m to 6.2 m depths) Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)		1.55	RC-1	RC	1524	TCR = 100%, SCR = 97%, RQD = 92%
2								
3					RC-2	RC	1524	TCR = 100%, SCR = 97%, RQD = 93%
4								
5					RC-3	RC	1524	TCR = 100%, SCR = 95%, RQD = 85%
6				136.76				
		End of Borehole Notes: 1. Borehole open and dry upon completion of drilling. 2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.		6.22				
7								
8								
9								
10								

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P W W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

GEMTEC
Consulting Engineers and Scientists

LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-17

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

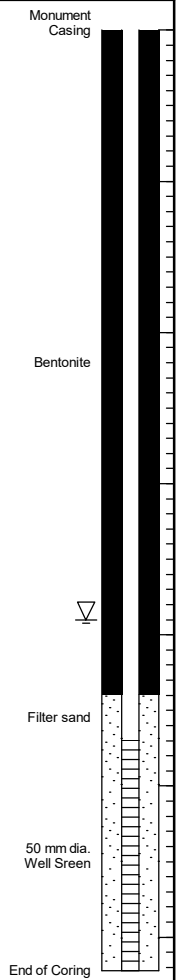
SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 25 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		141.46				
0	Power Auger / Hollow Stem Auger (152mm OD)	TOPSOIL (~50mm thick)		0.05	1A	SS		
		(SM) SILTY SAND, some gravel; grey, rock fragments; non-cohesive, moist, very dense		141.16 0.30	1B	SS	102	50/0.08
1		- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	25	50/0.03
				139.91	3	SS	25	50/0.03
		End of Augering		1.55				
2	HQ Coring	BEDROCK cored (approximately 1.7 m to 6.2 m depths)						
		Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)			RC-1	RC	1524	TCR = 100%, SCR = 98%, RQD = 97%
3								
4					RC-2	RC	1524	TCR = 100%, SCR = 98%, RQD = 98%
5					RC-3	RC	1524	TCR = 100%, SCR = 98%, RQD = 97%
6				135.24				
		End of Borehole		6.22				
7		Notes:						
		1. Borehole open and dry upon completion of drilling.						
		2. Monitoring well installed as shown upon completion of drilling.						
8		3. Groundwater level measured in monitoring well at approximately 3.9 mbgs (Elev. 137.6 m) on August 13, 2024.						
9								
10								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: NATURAL, REMOULDED
WATER CONTENT, %: W_P, W, W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/08/13	3.9 ▽	137.6

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LOGGED: IO
CHECKED: TO

GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

RECORD OF BOREHOLE : BH24-18

CLIENT: PEC Community Partners Inc.
PROJECT: Village A, Base 31 Area, Picton, Ontario
JOB#: 103306.002
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Jul 29 2024

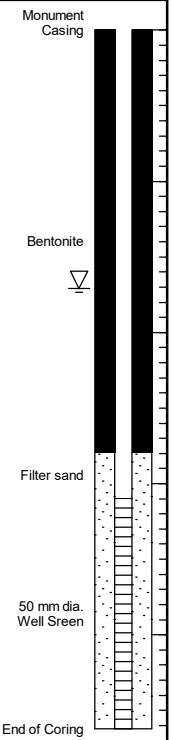
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
0	Power Auger	Ground Surface		147.15				
		TOPSOIL (~75mm thick)		0.08	1A	SS		
		(SM) SILTY SAND and GRAVEL; grey, rock fragments; non-cohesive, moist, very dense		146.85 0.30	1B	SS	203	50/0.1
1	Hollow Stem Auger (152mm OD)	- Auger grinding between depths of approximately 0.3 m (start of weathered BEDROCK) and 1.6 m			2	SS	152	50/0.0
				145.60	3	SS	25	50/0.0
2	HQ Coring	End of Augering BEDROCK cored (approximately 1.6 m to 4.6 m depths) Fine to medium grained, dark grey to black, strong to very strong, fresh LIMESTONE with shale/siltstone interbeds (Lindsay Formation)		1.55	RC-1	RC	1524	TCR = 100%, SCR = 95%, RQD = 83%
3								
4					RC-2	RC	1524	TCR = 100%, SCR = 97%, RQD = 87%
				142.53				
5		End of Borehole Notes: 1. Borehole open and dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling. 3. Groundwater level measured in monitoring well at approximately 1.7 mbgs (Elev. 145.4 m) on August 13, 2024.		4.62				
6								
7								
8								
9								
10								

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P W W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/08/13	1.7 ▽	145.4

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LOGGED: IO
CHECKED: TO

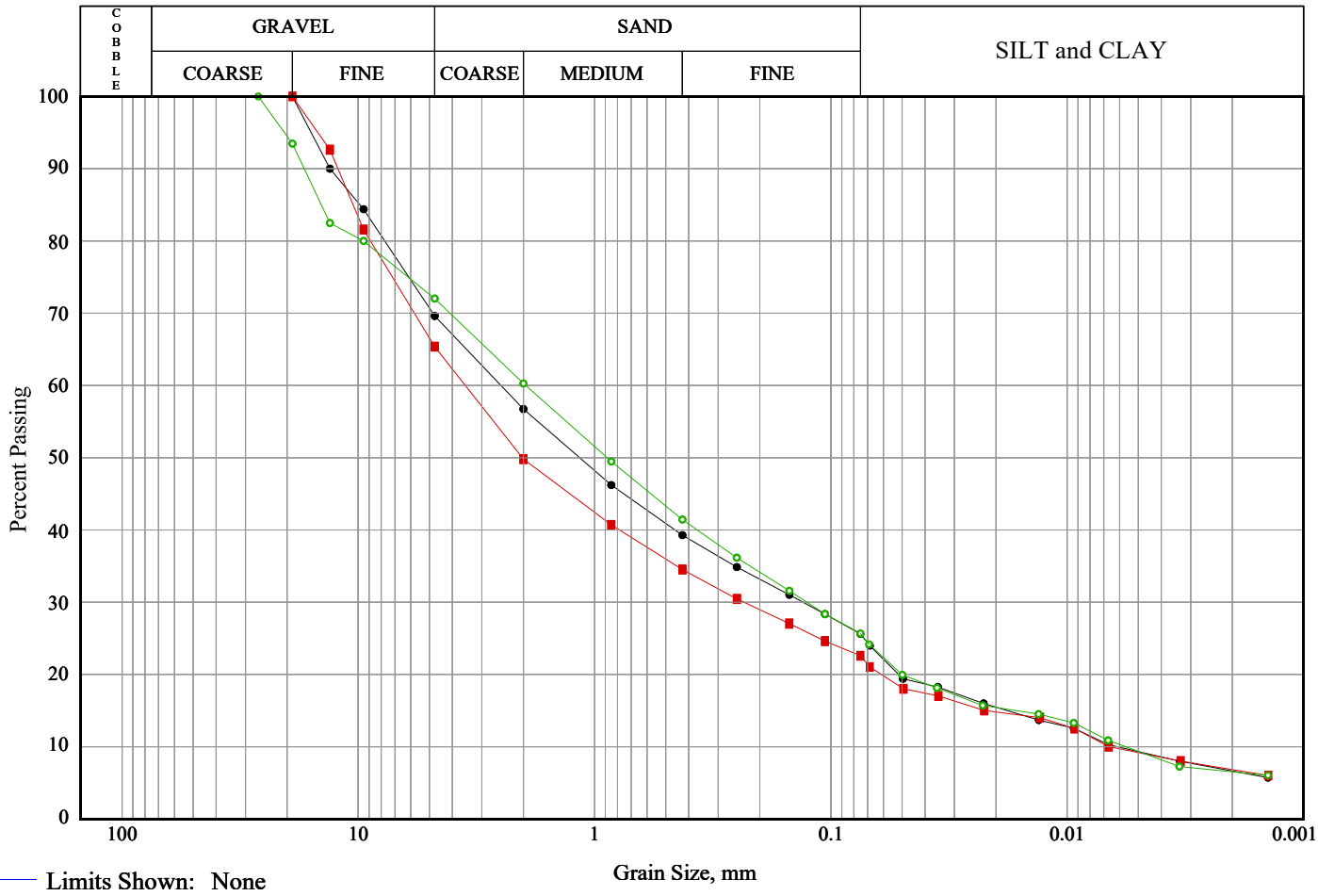
GEO - BOREHOLE LOG 103306.002_VILLAGEA_GINT_R0_2024_08_23.GPJ GEMTEC 2018.GDT 9/20/24

APPENDIX E

Geotechnical Laboratory Results

GEMTEC Consulting Engineers and Scientists	Client: PEC Community Partners Inc.	Soils Grading LS-702/ASTM D-422
	Project: Village A, Base 31 Area, Picton, Ontario	
	Project #: 103306002	

Note: More information available upon request



Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth (m)	% Cob.+ Gravel	% Sand	% Silt and Clay
●		BH24-4	SA-2	0.8	30.4	44.0	25.6
■		BH24-11	SA-2	0.8-1.4	34.6	42.8	22.6
○		BH24-13	SA-2	0.8	28.0	46.4	25.6

Line Symbol	USCS Classification	USCS Symbol	D_{10}	D_{15}	D_{30}	D_{50}	D_{60}	D_{85}	% 5-75µm
●	Gravelly SILTY SAND	SM	0.006	0.018	0.13	1.16	2.49	9.85	19.0
■	SILTY SAND and GRAVEL	SM	0.007	0.022	0.23	2.02	3.52	10.52	15.8
○	Gravelly SILTY SAND	SM	0.006	0.016	0.13	0.89	1.96	14.35	19.1

GEMTEC
Consulting Engineers and Scientists

Client: PEC Community Partners Inc.

Project: Village A, Base 31 Area, Picton, Ontario

Project #: 103306002

Rock Core Compressive Strength

Date/Time Sampled: 24/08/21 1:12:36 PM	Date/Time Tested: 24/08/21 1:12:36 PM

BH	Sample No	Depth (m)	Description	Diameter, mm	Area, mm²	Length After Capping, mm	L/D	Load, kN	Comp. Str., MPa
24-4	1890	3.5-3.8		63.3	3150	124	1.95	330.350	105.0
24-6	1891	4.2-4.5		63.3	3148	123	1.94	166.760	53.0
24-9	1892	2.7-2.9		63.3	3149	123	1.94	278.180	88.4

APPENDIX F

Rock Core Photographs

PEC Community Partners Inc.
Village A, Base 31 Residential Subdivision
Picton, Prince Edwards County, Ontario

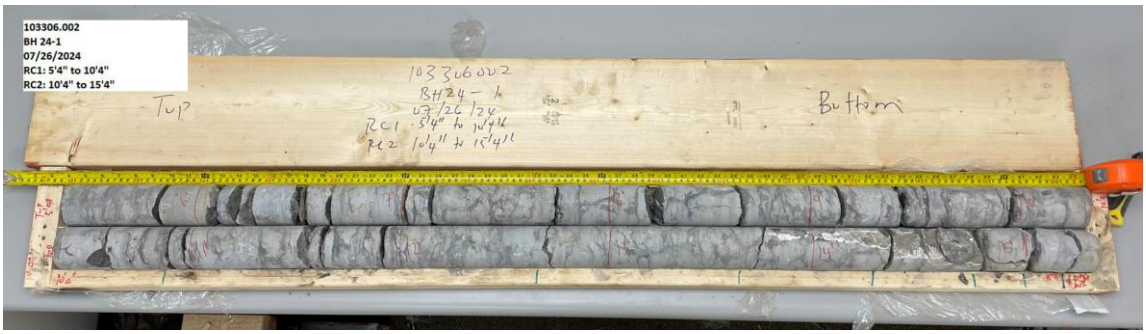


Photo 1: BH 24-1

Photo 2: BH 24-2

GEMTEC
Consulting Engineers and Scientists

Date:	September 20, 2024
Project No:	103306.002
Figure No:	1 and 2

Photo 3: BH 24-3

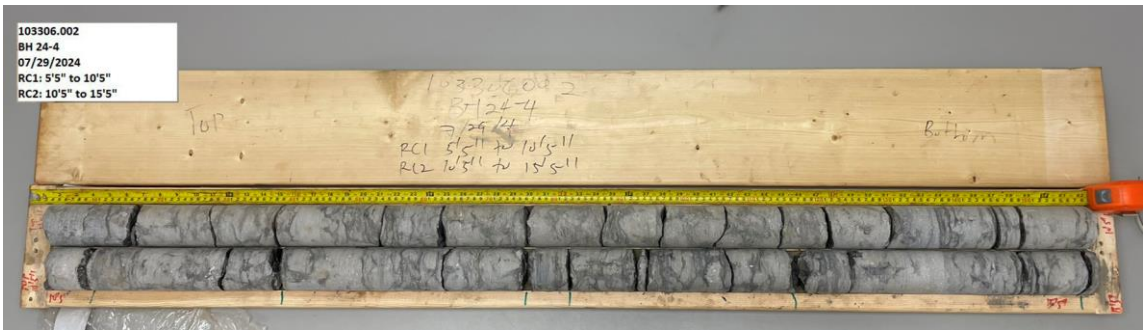


Photo 4: BH 24-4

PEC Community Partners Inc.
Village A, Base 31 Residential Subdivision
Picton, Prince Edwards County, Ontario

Photo 5: BH 24-5

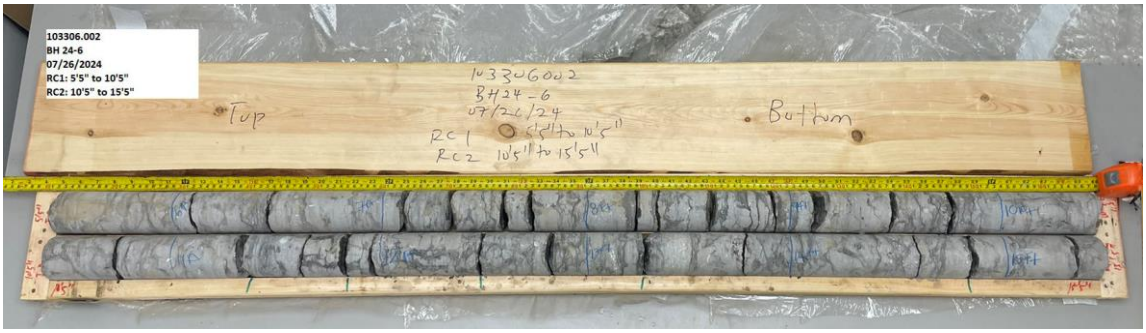


Photo 6: BH 24-6

Photo 7: BH 24-7

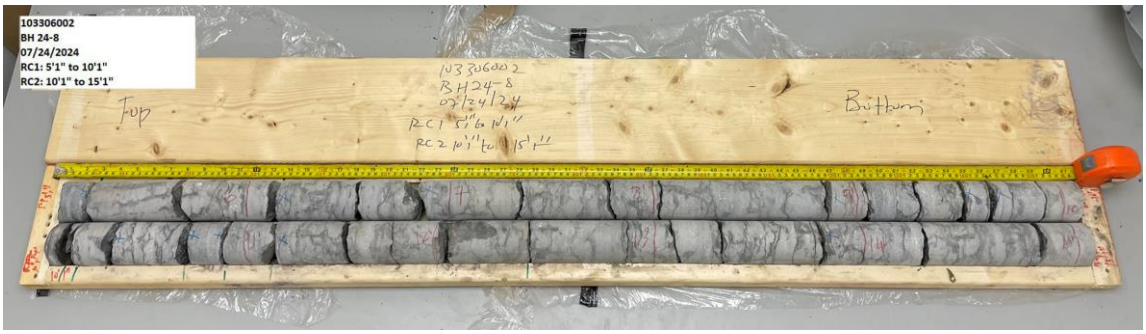


Photo 8: BH 24-8

PEC Community Partners Inc.
Village A, Base 31 Residential Subdivision
Picton, Prince Edwards County, Ontario

Photo 9: BH 24-9

Photo 10: BH 24-10

PEC Community Partners Inc.
Village A, Base 31 Residential Subdivision
Picton, Prince Edwards County, Ontario

Photo 11: BH 24-11

Photo 12: BH 24-12

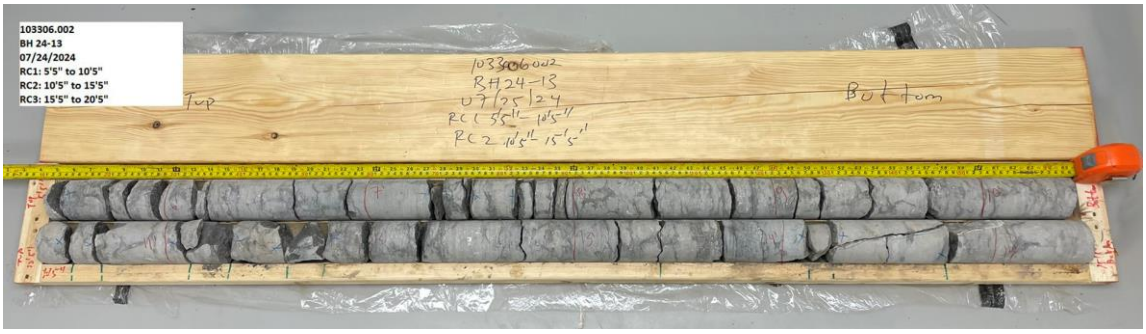


Photo 13: BH 24-13

Photo 14: BH 24-14

Photo 15: BH 24-15

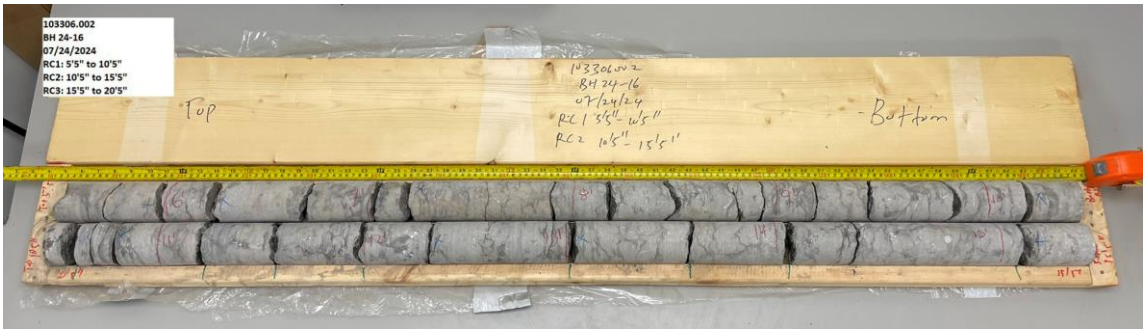
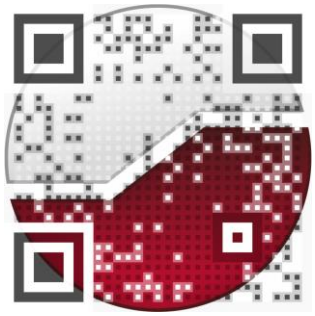


Photo 16: BH 24-16

Photo 17: BH 24-17

Photo 18: BH 24-18

experience • knowledge • integrity



civil	civil
geotechnical	géotechnique
environmental	environnement
structural	structures
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité

871 Equestrian Court, Unit 1, Oakville ON L6L 6L7
Tel: 647-795-8153 | www.pecg.ca

Date: November 1, 2023

Project #: 1510458

To: Chris Marchese
PEC Community Partners Inc.

From: Tanvi Patel M.Env.Sc., G.I.T. and Jason Cole, M.Sc., P. Geo.

Re: **Scoped Hydrogeological Assessment – Base 31 Water Servicing, Prince Edward County, Ontario**

1. Introduction

Palmer was retained by PEC Community Partners Inc. (the "Client") to undertake a scoped hydrogeological assessment to support design and tendering of the water and sanitary servicing contract for the Base 31 Property (the "site"). This report provides a preliminary dewatering assessment and an assessment of groundwater flow/ potential groundwater accumulation along the proposed watermain and sanitary forcemain alignment located on Country Road 22 and in the Base 31 area (**Figure 1**). *This report is subject to the Statement of Limitations presented in Section 5.*

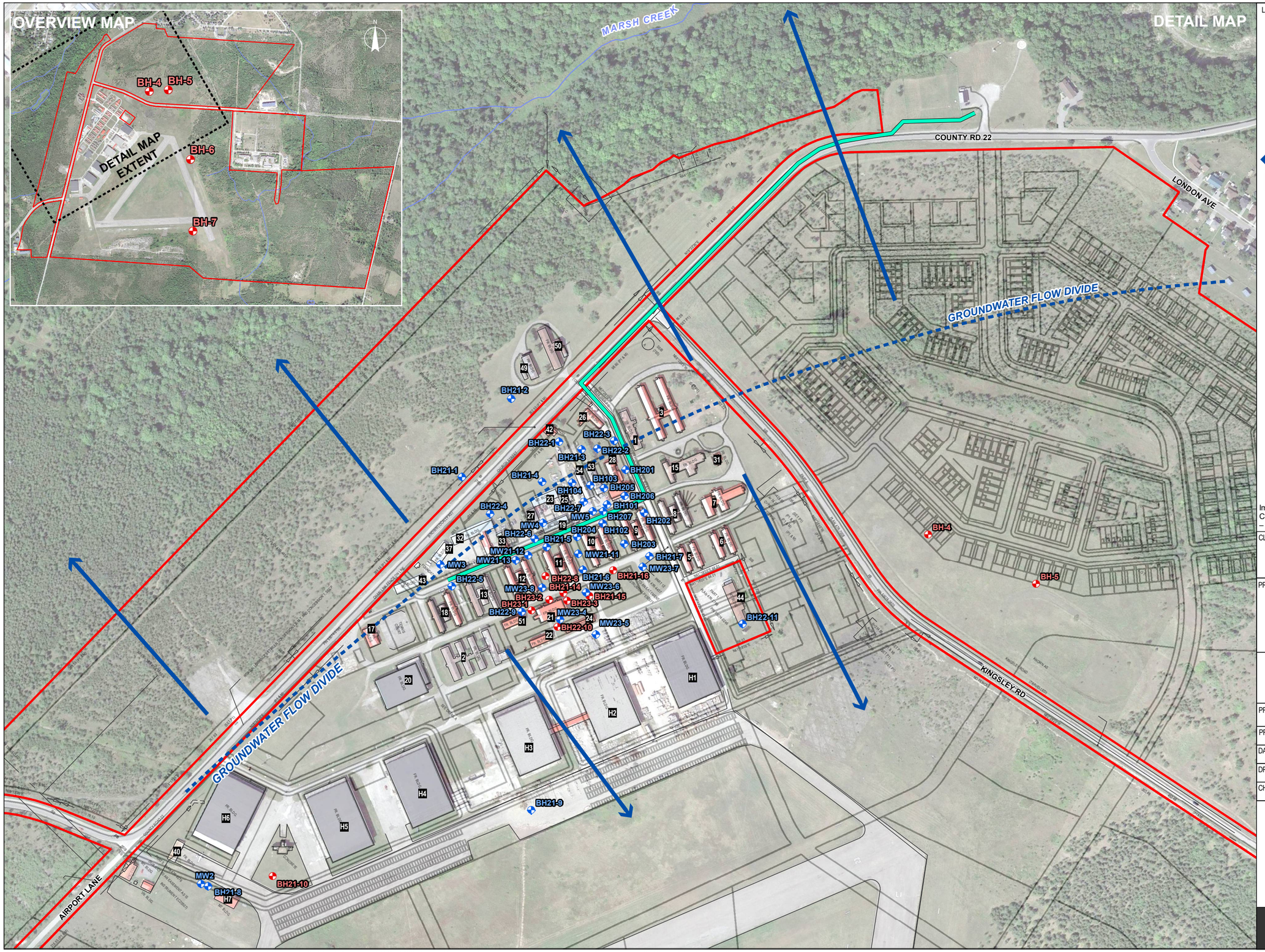
Based on the design drawings provided by SCS Consulting Group Limited (**Attachment A**), the watermain alignment includes 550 meters of 300 mm diameter watermain, that will be installed using open cut excavation from the Base 31 area extending east along Country Road 22 to an existing pumping station. The depth to the proposed watermain generally ranges from 1.8 to 2.1 metres below ground surface (mbgs). The sanitary forcemain alignment is assumed to have similar design parameters as the watermain, expect it will be installed on the opposite site of Country Road 22.

The watermain and sanitary forcemain alignment also passes through an area of known soil and groundwater contamination on the Base 31 site, where any water removed from the open cut excavation will need to be contained on-site for testing and treatment before it is taken off-site for disposal. Characterizing the typical and maximum dewatering rates through this area will allow for estimates to be made on the volume of contaminated water that may need to be managed and disposed of off-site.

2. Existing Conditions

The site is located within the Prince Edward Peninsula Physiographic Region (Chapman & Putnam., 1984). The surficial geology underlaying the alignment length based on available mapping by the Ontario Geological Survey (OGS) is labelled as Paleozoic bedrock, overlain by thin (i.e., <1 m) native or fill soils.

There is a contact between two bedrock units on site with the bedrock underlaying the alignment consisting of both limestones of the Lindsay Formation and limestones/ shales of the Verulam Formation



LEGEND:

- Borehole Location
- Monitoring Well Location
- Site Building Number
- Watermain Alignment
- Proposed Development
- Watercourse (MNRF/LIO)
- Groundwater Flow Direction
- Subject Site

CLIENT: Tercot Acquisitions Limited

PREPARED BY: Palmer

0 40 80
metres

PROJECT:	Picton Airport		
PROJECT NO.	1510436	REVISION:	1
DATE:	Oct 13, 2023	SCALE:	1:4000
DRAWN:	CV	DATUM:	NAD 1983
CHECKED:	TPat	PROJECTION:	UTM zone 18

Site Plan and Groundwater Flow

Figure 1

Document Path: G:\Shared drives\Projects 2015\15104 - Tercot Development Group\1510436 - Picton Airport\GIS (2023 Project Consolidation)\1_Workspace\Task 5 - HydroG Figures\1510436-1-1-Site Plan and Groundwater Flow.mxd

depending upon the location (Armstrong & Dodge., 2007). The depth of bedrock on site can be found at depths of < 1 mbgs.

3. Site Specific Geology

3.1 Site Stratigraphy

The stratigraphy underlaying site is delineated based on boreholes drilled for a previous assessment completed as part of Palmer's Supplemental Phase II Environmental Site Assessment (ESA) (Palmer, 2022). Selected borehole logs are included for reference in **Attachment B**. Boreholes were advanced using a Geoprobe *7822DT* or a *GM100* mounted on a trach equipped with augers and spilt spoons. Rock coring and crushing by air hammer was conducted. Boreholes were generally completed as 2-inch (51 mm) diameter groundwater monitoring wells, with 10 ft (3 m) long screens installed across the shallow groundwater table at the bottom of the borehole.

The observed stratigraphy on site generally comprised of surficial asphalt pavement or grass overlying various fill materials (sand and gravel, silty clay, clayey silt, sandy silt, or silty sand fill) which was underlain by limestone bedrock. The following table summarizes the site stratigraphy (**Table 1**).

Future geotechnical drilling is planned along County Road 22 to characterize the soils and bedrock along the watermain and sanitary forcemain alignment. As this additional drilling was not completed at the time of reporting, for the purposes of this scoped study it is considered reasonable to assume that the geology along County Road 22 will be generally similar to the conditions identified on the Base 31 site.

Table 1. Site Stratigraphy

Geological Unit	Stratigraphy	Depth Range (mbgs)
Surface	Asphalt Pavement	0.00 to 0.05
	Grass/Topsoil	0.00 to 0.10
Fill Strata (Disturbed Native)	Clayey Silt Fill	0.05 to 1.07
	Sandy Silt Fill	0.05 to 1.83
	Silty Clay Fill	0.05 to 1.22
	Sand & Gravel Fill	0.05 to 1.22
	Silty Sand Fill	0.05 to 0.91
Bedrock	Limestone	0.30 to >12.19

3.2 Groundwater Level and Flow

Static groundwater levels were previously measured between May 31, 2021, and March 22, 2022, as part of Palmer's Supplemental Phase II ESA report (Palmer, 2022). Groundwater levels measured in thirty-seven (37) monitoring wells ranged from 0.73 to 13.38 mbgs. The previous groundwater level data is presented in **Attachment C**.

A groundwater high was identified on the Base 31 property and the inferred groundwater flow direction is radially towards southeast on the Base 31 property, with groundwater flow to the northwest found closer to County Road 22 (Palmer, 2022).

As presented on **Figure 1**, along the watermain and sanitary forcemain alignment as groundwater flow divide was interpolated, with groundwater on the northwest side of Country Road 22 flowing northwest towards Marsh Creek following topography and groundwater on the east side flowing southeast towards wetland areas on the larger Picton Airport lands.

3.3 Single Well Response Testing

On October 6, 2023, Palmer staff conducted single well response testing at five (5) pre-existing monitoring wells to assess the in-situ hydraulic conductivity of the screened stratigraphy. A change in head was created in each of the five (5) wells through removing a column of groundwater and the rate of recovery was measured using a datalogger installed in the well to take water level measurements. All groundwater removed in the area of known contamination was collected and stored in existing drums on-site.

Hydraulic conductivity values (K-value) were then estimated using the displacement-time data and were analysed using the Unconfined Bouwer-Rice (1976) method using Aqtesolv™ software. The analysis results are presented in **Attachment D**, and the range of estimated K-values are summarized below in **Table 2**. One (1) analysis (BH22-9) conducted as part of Palmer's Supplemental Phase II ESA has been included due to its relevancy for the dewatering assessment. Based on the results, the K-values of bedrock is highly variable and dependent on bedrock fractures and/or the degree of weathering in the upper bedrock. The K-values were found to range from 1.5 $x10^{-9}$ to 4.9$x10^{-6}$ m/s, which is considered to be consistent with the variability expected in the fractured bedrock units.

Table 2. Hydraulic Conductivity Summary Table

BH ID	Screened Geology	Solution	Test Type	Hydraulic Conductivity (K) (m/s)	Geometric Mean K (m/s)	90th Percentile K (m/s)
BH21-1	Bedrock	Unconfined Bouwer-Rice	Rising Head	2.5$x10^{-8}$	1.6$x10^{-7}$	3.2$x10^{-6}$
BH21-5		Unconfined Bouwer-Rice	Rising Head	5.5$x10^{-7}$		
BH21-13		Unconfined Bouwer-Rice	Rising Head	1.4$x10^{-6}$		
BH22-3		Unconfined Bouwer-Rice	Rising Head	1.5$x10^{-7}$		
BH22-4		Unconfined Bouwer-Rice	Rising Head	1.5$x10^{-9}$		
BH22-9		Unconfined Bouwer-Rice	Rising Head	4.9$x10^{-6}$		

4. Preliminary Hydrogeological Construction Considerations

4.1 Construction Dewatering for Watermain Installation

Based on our understanding of the project, the proposed works include the installation of a 300mm watermain from Base 31 extending east along County Road 22 to an existing pumping station (**Figure 1**). The drawings for the watermain are provided in **Attachment A**.

It is important to note that all excavation dimensions and depths used in this report are presented solely for the purposes of estimating groundwater dewatering rates and are not intended to direct construction activity.

4.1.1 Dewatering Rate Estimate

To maintain stable and dry working conditions, the water level should be lowered to at least 0.5 m below the proposed maximum excavation depth. The depth of the 300 mm watermain ranged from approximately 1.8 to 2.1 m below grade, accounting for the watermain diameter, the excavation will range from 2.1 to 2.5 m below grade. The highest measured groundwater level during the previous monitoring period of May 31st, 2021, to March 22nd 2022 of 1.23 mbgs was used to account for springtime high groundwater levels.

Dewatering rate estimate (Q) for the proposed watermain installation was calculated using trench shaped unconfined solution. The calculation used the highest groundwater level measured on site, deepest typical watermain depth, and the geometric mean K-value calculated for the bedrock. A dewatering rate estimate is also provided for the highest K-value measured to give a conservative value to account for the potential of encountering pockets or zones of more highly fractured bedrock which would result in higher dewatering rates over specific intervals.

Table 3 summarizes the dewatering rate estimates (Q) calculations for the proposed open-cut sections (2 m wide x 30 m long) using the following equation from Powers et.al (2007):

Unconfined solution:

$$Q_{open\ cut} = Q = \frac{\pi K(H^2 - h^2)}{ln\left(\frac{Ro}{r_e}\right)} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right] \quad m^3/s$$

Where K = hydraulic conductivity (m/s)
H = saturated thickness (m)
h = saturated thickness after dewatering (m)
R_0 = radius of influence estimated using the Sichardt Approximation:
$R = 3000 * (H\text{-}h)*\sqrt{K}$ (m)
r_e = equivalent well radius estimated by:
$r_e = \sqrt{\frac{a*x}{\pi}}$ (m)
Where a = excavation width (m)

x = excavation length (m)

Table 3. Dewatering Rate Assessment

Parameters	Watermain or Sanitary Forcemain Alignment	
Excavation depth (mbgs)	2.4	
Groundwater Level Target (masl)	2.9	
Assumed High Groundwater Level (masl)	0.73	
Dewatered Medium	Bedrock	
H (m)	2.17	
h (m)	0	
a (m)	2	
x (m)	30	
K (m/s)	Geometric Mean	Highest K-value
	1.7×10^{-7}	4.9×10^{-6}
R_0 (m)	**2.7**	**14.4**
$Q_{open-cut}$ (L/day)	**1,779**	**10,768**
$Q_{open-cut}$ UF=1.5x (L/day)	**2,669**	**16,152**
Direct Rainfall of a 25 mm storm event (L/day)	**1,500**	**1,500**

a – trench width
x – trench length
K – Hydraulic conductivity of dewatered medium
H – initial saturated thickness
h – saturated thickness after dewatering
R – radius of influence
L – line source distance
Q – dewatering rate

As summarized in **Table 3**, the typical groundwater dewatering rate expected over a 30 m long watermain section is 2,669 L/day or 1.85 L/min. An additional 1,500 L/day should be added to account for a large precipitation event. Due to the highly variable hydraulic conductivity in the fracture bedrock, there may be sections of the watermain where groundwater seepage is greater than that of a typical section. Up to 16,152 L/day or 11.23 L/min should be expected over shorter intervals where more highly fractured and saturated bedrock is encountered. Again, an additional 1,500 L/day should be added to account for a large precipitation event.

4.2 Construction Dewatering for Sanitary Forcemain Installation

It is Palmer's understanding that a proposed sanitary forcemain installation is proposed opposite to the watermain along Country Road 22 and within the Base 31 Area. It should be noted that only the alignment of the sanitary forcemain is provided in the September 2023 draft design (Appendix A), and not the depth or profile. Therefore, for the purposes of dewatering rate estimates, the depth of the sanitary forcemain has been estimated to be the same depth as the watermain (1.8 to 2.1 m below grade) based on communications with SCS Engineering (email dated Oct 30, 2023). The specific dimensions of the sanitary forcemain are not available at the time of the report and have been assumed to be the same

width as the watermain, 300 mm. Accounting for this width of the sanitary forcemain, the excavation will range from 2.1 to 2.5 m below grade.

If the sanitary forcemain reflects the same installation depth and width of the watermain, the dewatering rate estimates should be the same as for the watermain. As noted above in **Table 3** and consistent with the watermain, the typical dewatering rate expected over a 30 m long sanitary forcemain section is 2,669 L/day or 1.85 L/min. An additional 1,500 L/day should be added to account for a large precipitation. Up to 16,152 L/day or 11.23 L/min should be expected over shorter intervals where more highly fractured and saturated bedrock is encountered. Again, an additional 1,500 L/day should be added to account for a large precipitation event.

4.3 Water Taking Permitting Recommendations

Based on the dewatering rate estimates provided above, the highest dewatering rate based on the assumptions provided is estimated to be 16,152 L/day for a 30 m long section of the watermain or the sanitary forcemain. This dewatering rate is below the Ministry of the Environment, Conservation and Parks (MECP) water taking permitting threshold of 50,000 L/day for registration on the Environmental and Section Registry (EASR) and below the threshold of 400,000 L/day requiring a Category 3 Permit to Take Water (PTTW). Therefore, either an EASR or PTTW are not expected to be required for this project unless multiple watermain and/or sanitary forcemain sections are excavated concurrently.

4.4 Groundwater Flow and Accumulation

Potential areas for groundwater and/or surface water runoff to accumulate at topographic low points along the watermain alignment was identified on the design drawings (**Attachment A**) specifically between 2+335 to 2+260 where a dip in the topography is present. Since there is a high topographic area observed at Base 31, a groundwater flow divide was interpolated where groundwater on the northwest side of Country Road 22 flows towards Marsh Creek following the topography and groundwater on the east side flows southeast towards wetland areas on the larger Picton Airport lands (**Figure 1**). Considering the groundwater flow perpendicularly across County Road 22 perpendicular from where the interpolated groundwater divide is located and the upper bedrock as sufficient permeability to transmit water, the potential for significant groundwater accumulation in these topographic low areas along the alignment is not expected.

It should be noted that although significant groundwater accumulation is not expected, surface water may accumulate in low topographic areas along the alignment over the construction period. Based on the design drawings, topography gradually decreases until reaching a low point along the alignment for approximately 280 m. The estimated volume for a 25 mm storm event that could potentially flow and accumulate at the topographic low areas is estimated to be approximately 14,000 L/day. Over the long-term, this volume of surface water would not be expected to accumulate as the bedrock has sufficient permeability to transmit water along the shallow groundwater flow path northeast towards Marsh Creek. However, during the construction period, the contractor should be prepared for a potential surface water volume of 14,000 L/day to accumulate given a 25 mm storm event during construction.

4.5 Groundwater Discharge and Management

Where groundwater meets Prince Edward County Sewer Use By-Law No. 1803 limits for storm sewer discharge, and given a low typical dewatering rate estimate of 2,669 L/day, it is expected that dewatering along uncontaminated areas of the watermain or sanitary forcemain alignment (i.e., along Country Road 22 and outside of the area of contaminated soils as identified in the Supplemental Phase II ESA Report (Palmer, 2022))can be discharged locally to the roadside ditch.

Where contaminated soils and/or groundwater was identified on the Base 31 site that exceed applicable O.Reg. 153/04 Standards, as presented in the Palmer Supplemental Phase II ESA Report (Palmer, 2022), any water (groundwater and surface water) removed from the watermain excavation trench must be fully contained on-site and not discharged to the environment. Water quality of the contained water must be tested, and based on the results directed to an appropriate off-site facility for disposal, as required.

While it is expected that typically one 2,669 L/day of dewatering would be required for watermain or sanitary forcemain installation, the contractor should be prepared to handle up to 16,152 L/day over short intervals, particularly where there is known soil and/or groundwater contamination, to account for variation in bedrock permeability.

5. Statement of Limitations

The extent of this study was limited to the specific scope of work for which we were retained and that is described in this report. Palmer has assumed that the information provided by the client, or any secondary sources of information are factual and accurate. Palmer accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations, or negligent acts from relied upon data. Judgment has been used by Palmer in the interpretation of the information provided but subsurface physical and chemical characteristics may differ from regional scale geology mapping and vary between or beyond well/borehole locations given the inherent variability in geological conditions.

Palmer is not a guarantor of the geological or groundwater conditions at the subject site but warrants only that its work was undertaken, and its report prepared in a manner consistent with the level of skill and diligence normally exercised by competent geoscience professionals practicing in the Province of Ontario. Our findings, conclusions and recommendations should be evaluated in light of the limited scope of our work.

The information and opinions expressed in the Report are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT PALMER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS PALMER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belongs to Palmer. Any use which a third party makes of the Report is the sole responsibility of such third party. Palmer accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Palmer's express written permission. Should the project design change following issuance of the Report, Palmer must be provided the opportunity to review and revise the Report in light of such alteration or variation.

6. Signatures

Thank you for the opportunity to support PEC Community Partners Inc. with this interesting project. Should there be any question on this report, please contact the undersigned.

Prepared By:

Tanvi Patel, M.EnvSc., G.I.T.
Environmental Scientist

Reviewed By:

Jason Cole, M.Sc., P.Geo.
VP, Principal Hydrogeologist

References

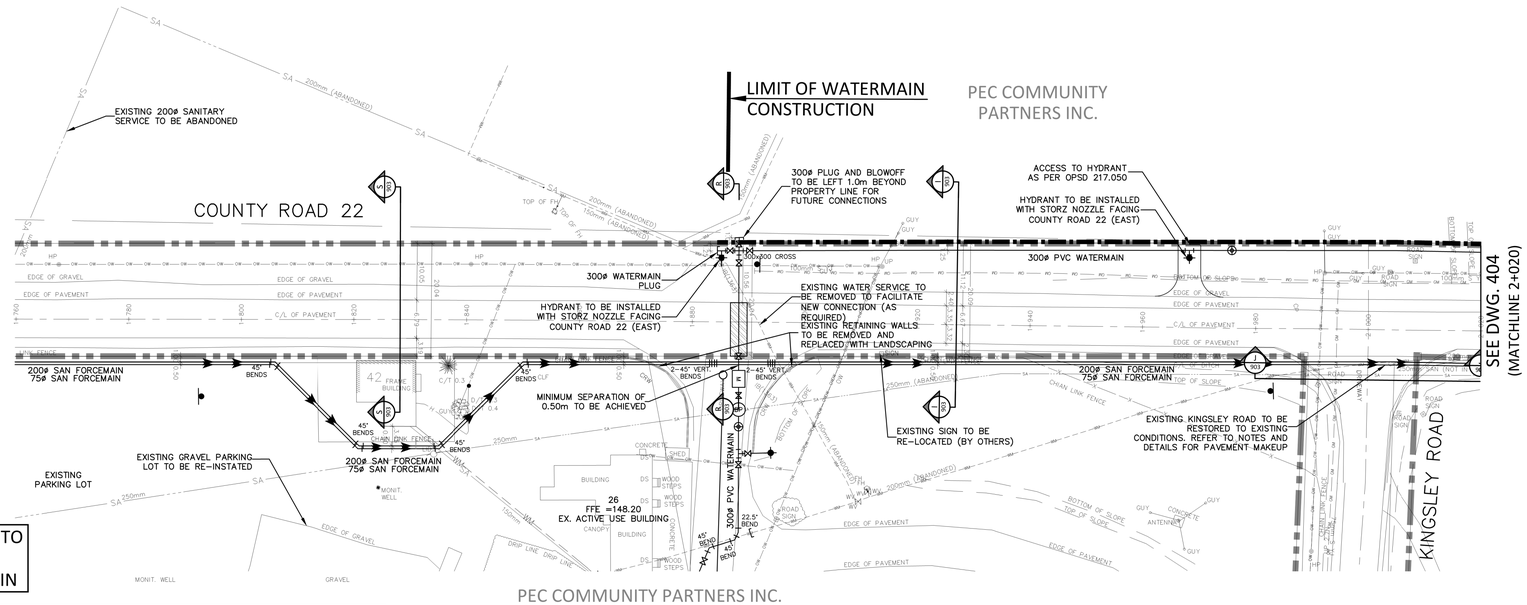
Armstrong, D.K., and Dodge, J.E.P., 2007: Paleozoic Geology Map of Southern Ontario. Ontario Geological Survey, Miscellaneous Release – Data 219.

Chapman, L.J., and Putnam, D.F., 2007: The Physiography of Southern Ontario. Ontario Geological Survey, Miscellaneous Release – Data 228.

Ontario Geological Survey, 2003: Surficial Geology of Southern Ontario.

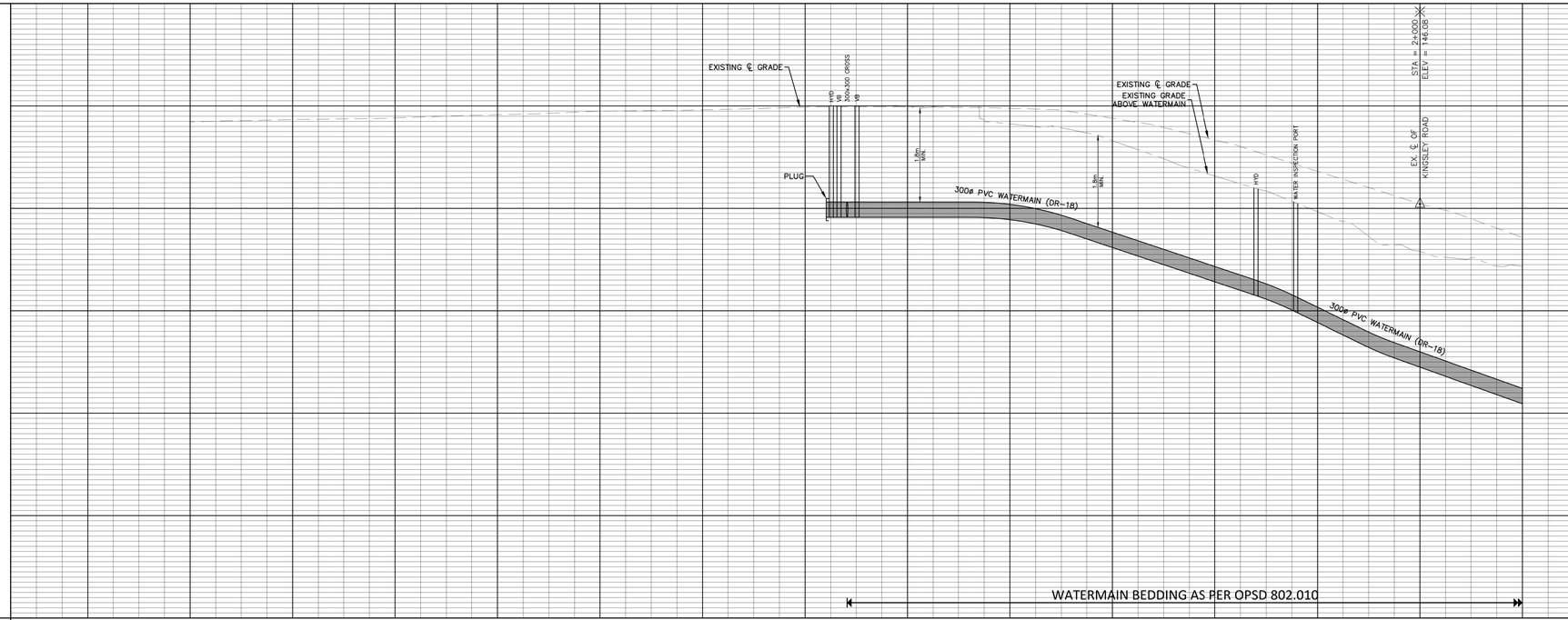
Palmer, 2022: Supplemental Phase II Environmental Site Assessment (ESA). Reference #1510436.

Attachment A – Design Drawings (SCS, 2022)

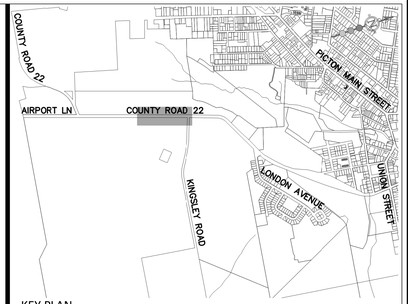


ALL UTILITY AND HYDRO POLES TO BE SUPPORTED DURING CONSTRUCTION OF WATERMAIN

300Ø WATERMAIN CROSSING OF COUNTY ROAD 22 TO BE INSTALLED VIA OPEN CUT. BACKFILL WITH GRANULAR B AND RESTORE PAVEMENT STRUCTURE TO EXISTING CONDITION. ONE LANE OF TRAFFIC TO REMAIN OPEN AT ALL TIMES. CONTRACTOR TO PREPARE TRAFFIC MANAGEMENT PLAN, AS PER OTM BOOK 7 AND OBTAIN ALL NECESSARY APPROVALS PRIOR TO CONSTRUCTION.



CL EXISTING/ PROPOSED ELEVATIONS	147.69	147.73	147.77	147.83	147.90	147.92	147.98	147.98	147.95	147.76	147.34	146.72	146.08	145.43	EXISTING/ PROPOSED ELEVATIONS
CHAINAGE	1+760		1+800		1+840		1+880		1+920		1+960		2+000		CHAINAGE



KEY PLAN
N.T.S.

BENCHMARK: ELEV. 141.477m

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO MNRF BENCHMARK No. 01019820216 HAVING A PUBLISHED ELEVATION OF 141.477 METERS.

LEGEND:

- LIMIT OF PROPERTY
- SANITARY FORCEMAIN
- WATERMAIN / VALVE BOX
- HYDRANT AND VALVE
- BH21-3 BOREHOLE
- M METER CHAMBER
- BP BACKFLOW PREVENTER (CSA B64.10 AND B64.10.01)
- WATER INSPECTION PORT
- SEDIMENT CONTROL FENCE (SEE DETAILS ON 900 SERIES DRAWINGS)
- EXISTING ROAD BASE TO BE REMOVED AND EXCAVATED FOR INSTALLATION OF WATERMAIN AND BACKFILLED WITH GRANULAR B. ROAD BASE TO BE RESTORED TO EXISTING CONDITION.
- TEMPORARY SILT SOXX CHECK DAM
- EXISTING OVERHEAD WIRE
- EXISTING CHAINLINK FENCE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING GAS MAIN
- HP EXISTING HYDRO POLE
- MH EXISTING MANHOLE
- WV EXISTING WATERMAIN VALVE
- FH EXISTING HYDRANT
- EXISTING MONITORING WELL
- GM/HM EXISTING UTILITY
- SIGN EXISTING ROAD SIGN
- CB EXISTING CATCHBASIN
- EXISTING TREES

TOPOGRAPHIC SURVEY PROVIDED BY SCHAEFFER DZALDOV BENNET LTD., OCTOBER 2022

REVISIONS

No.	DESCRIPTION	DATE	BY	APPROVED

SCS consulting group ltd
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FAX: (905) 475-8335

TheCounty PRINCE EDWARD COUNTY • ONTARIO
332 PICTON MAIN STREET,
PICTON ON, K0K 2T0
TEL: 613.476.2148 EXT. 1023
TEL: 613.962.9108 EXT. 1023

PEC COMMUNITY PARTNERS INC.

PICTON AIRPORT - TERCOT

COUNTY ROAD 22
STA. 1+760 TO 2+020

DATE:	SEPTEMBER 2023	CHECKED BY:	S.S.
SCALE:	H 1:500 V 1:50	DRAWN BY: E.S.	CHECKED BY: S.S.

5 0 10 20 30 40 HORIZONTAL

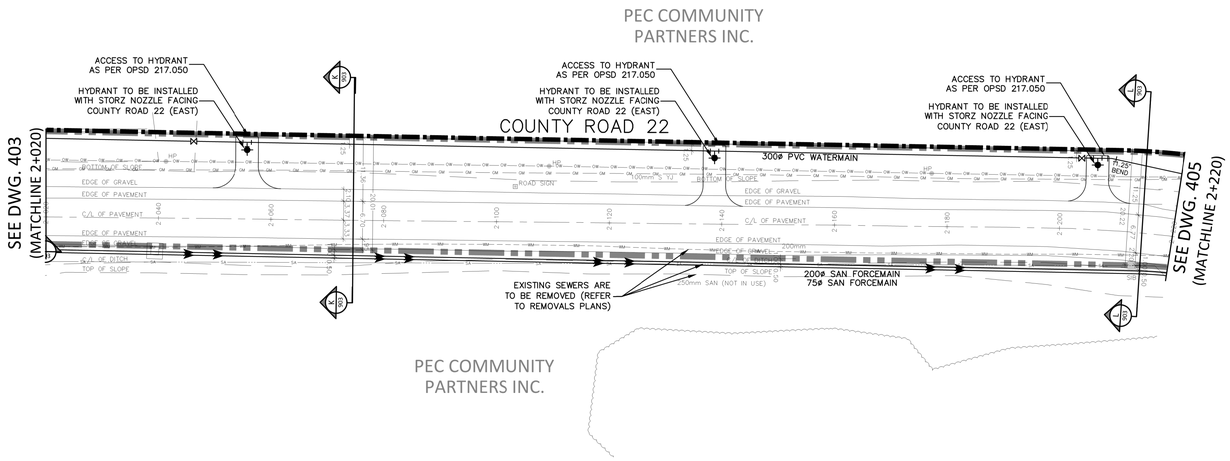
APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF SCS CONSULTING GROUP LTD. CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION.

Date

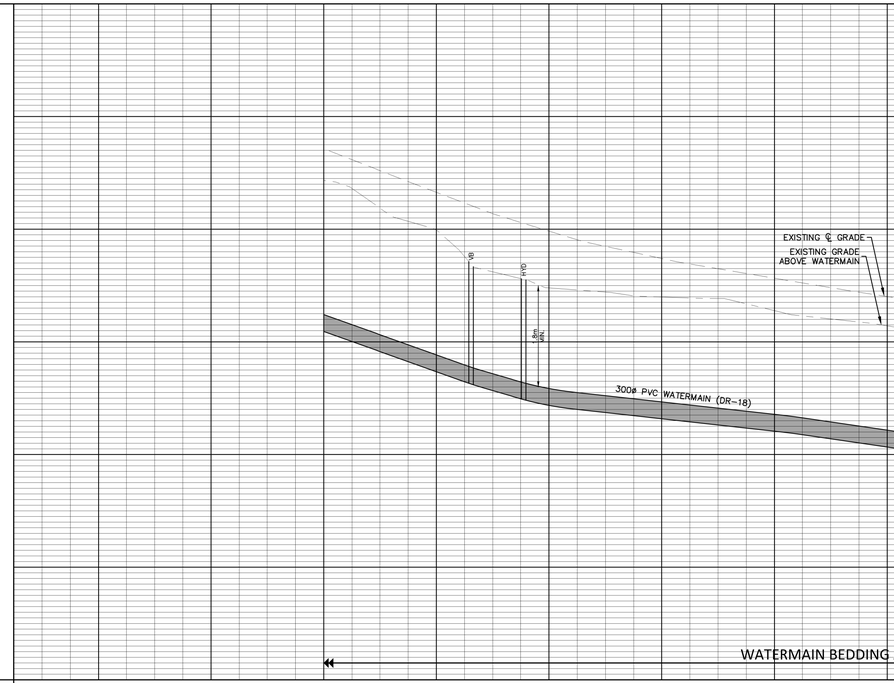
PROJECT No: 2365

DRAWING No: 403

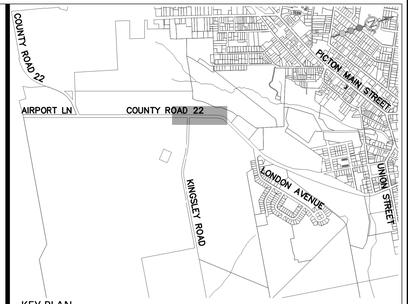
DRAFT



ALL UTILITY AND HYDRO POLES TO BE SUPPORTED DURING CONSTRUCTION OF WATERMAIN



CL EXISTING/ PROPOSED ELEVATIONS	145.43	144.65	143.97	143.48	143.13	142.80	142.48	142.20	141.98	141.71	141.48	EXISTING/ PROPOSED ELEVATIONS
CHAINAGE		2+040		2+080		2+120		2+160		2+200		CHAINAGE



KEY PLAN
N.T.S.

BENCHMARK: ELEV. 141.477m

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO MNRF BENCHMARK No. 01019820216 HAVING A PUBLISHED ELEVATION OF 141.477 METERS.

LEGEND:

- LIMIT OF PROPERTY
- SANITARY FORCEMAIN
- WATERMAIN / VALVE BOX
- HYDRANT AND VALVE
- BH21-3 — BOREHOLE
- M — METER CHAMBER
- BP — BACKFLOW PREVENTER (CSA B64.10 AND B64.10.01)
- WATER INSPECTION PORT
- SEDIMENT CONTROL FENCE (SEE DETAILS ON 900 SERIES DRAWINGS)
- EXISTING ROAD BASE TO BE REMOVED AND EXCAVATED FOR INSTALLATION OF WATERMAIN AND BACKFILLED WITH GRANULAR B. ROAD BASE TO BE RESTORED TO EXISTING CONDITION.
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- EXISTING OVERHEAD WIRE
- EXISTING CHAINLINK FENCE
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- EXISTING SANITARY SEWER
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- HP — EXISTING HYDRO POLE
- MH — EXISTING MANHOLE
- WV — EXISTING WATERMAIN VALVE
- FH — EXISTING HYDRANT
- EXISTING MONITORING WELL
- GM/HM — EXISTING UTILITY
- SIGN — EXISTING ROAD SIGN
- CB — EXISTING CATCHBASIN
- EXISTING TREES

TOPOGRAPHIC SURVEY PROVIDED BY SCHAEFFER DZALDOV BENNET LTD., OCTOBER 2022

REVISIONS

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PICTON ON, K0K 2T0
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TEL: 613.962.9108 EXT. 1023

PEC COMMUNITY PARTNERS INC.

PICTON AIRPORT - TERCOT

COUNTY ROAD 22
STA. 2+020 TO 2+220

DATE:	SEPTEMBER 2023	DESIGNED BY:	E.S.	CHECKED BY:	S.S.
SCALE:	H 1:500 V 1:50	DRAWN BY:	E.S.	CHECKED BY:	S.S.

5 0 10 20 30 40 HORIZONTAL

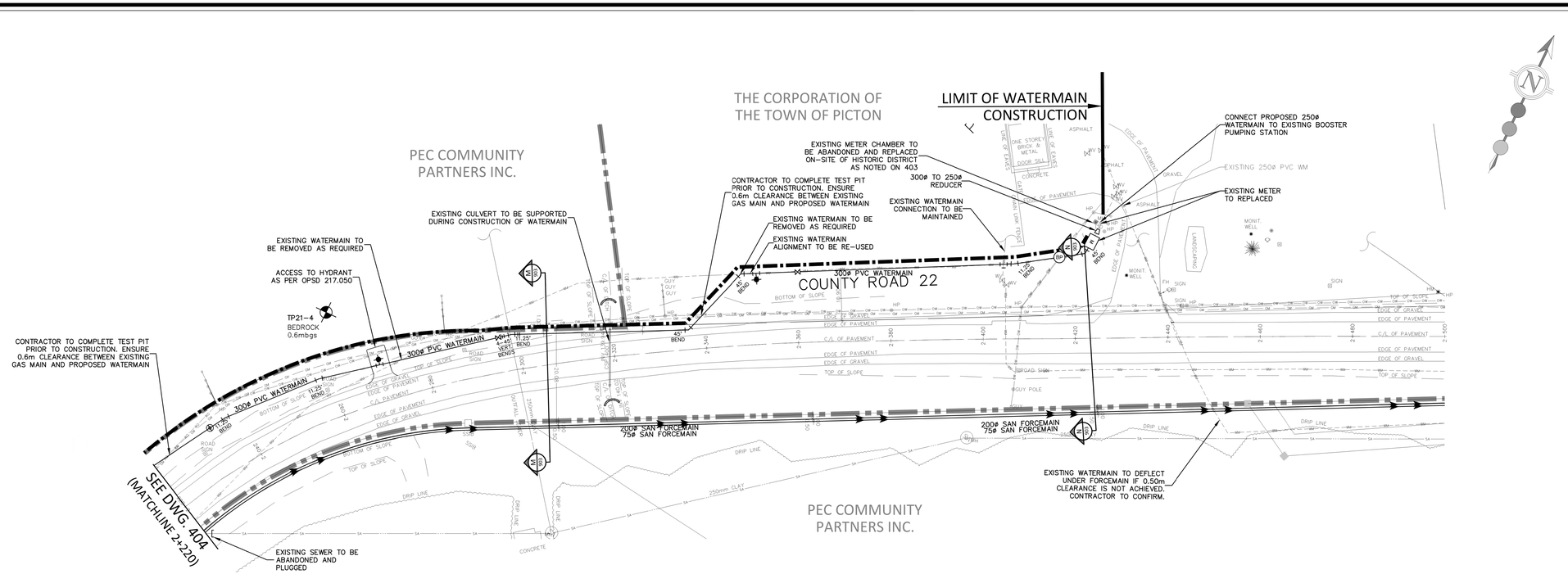
APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF SCS CONSULTING GROUP LTD. CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION.

Date

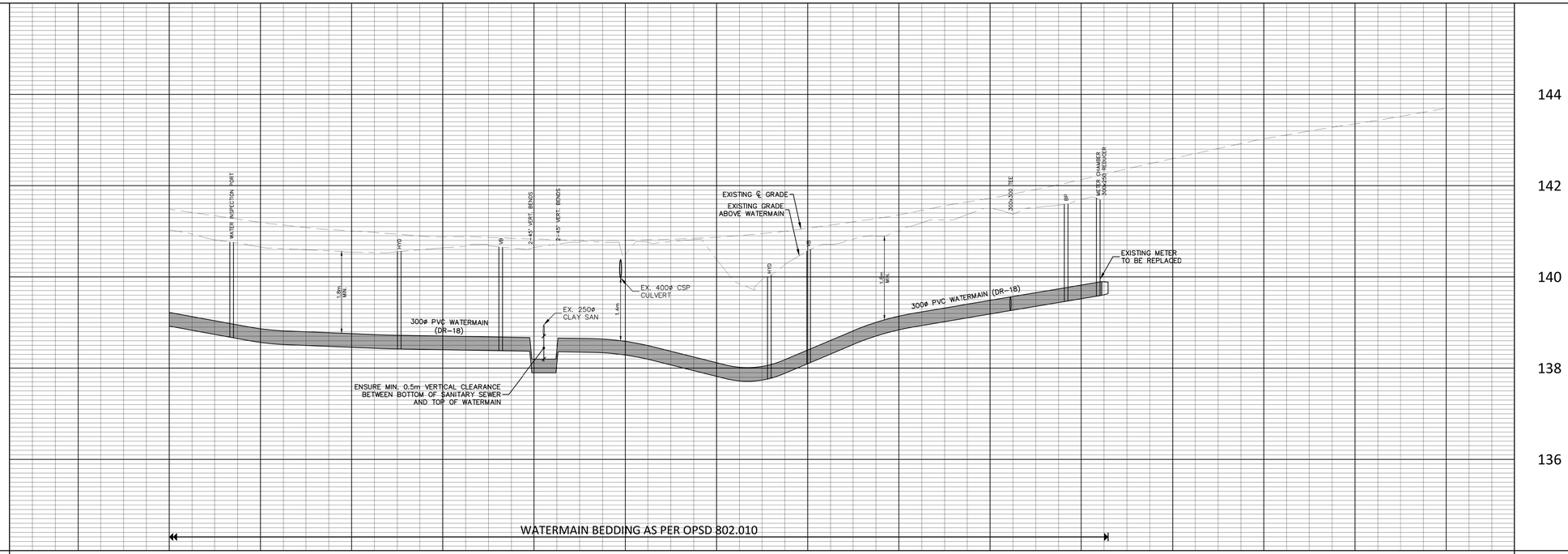
PROJECT No: 2365

DRAWING No: 404

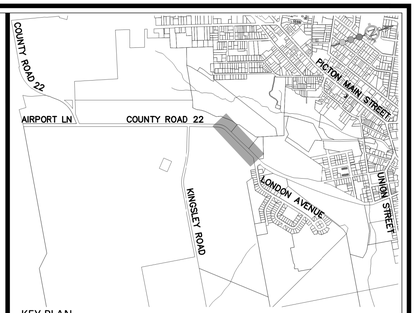
DRAFT



ALL UTILITY AND HYDRO POLES TO BE SUPPORTED DURING CONSTRUCTION OF WATERMAIN



CL EXISTING/ PROPOSED ELEVATIONS	141.48	141.20	141.01	140.88	140.83	140.80	140.87	141.07	141.36	141.72	142.13	142.59	143.03	143.35	143.70	EXISTING/ PROPOSED ELEVATIONS
CHAINAGE		2+240		2+280		2+320		2+360		2+400		2+440		2+480		CHAINAGE



KEY PLAN
N.T.S.

BENCHMARK: ELEV. 141.477m

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LEGEND:

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- TEMPORARY SILT SOXX CHECK DAM
- OH EXISTING OVERHEAD WIRE
- X EXISTING CHAINLINK FENCE
- W EXISTING WATERMAIN
- SA EXISTING SANITARY SEWER
- GM EXISTING GAS MAIN
- HP EXISTING HYDRO POLE
- MH EXISTING MANHOLE
- WV EXISTING WATERMAIN VALVE
- FH EXISTING HYDRANT
- EXISTING MONITORING WELL
- GM/HM EXISTING UTILITY
- SIGN EXISTING ROAD SIGN
- CB EXISTING CATCHBASIN
- EXISTING TREES

TOPOGRAPHIC SURVEY PROVIDED BY SCHAEFFER DZALDOV BENNET LTD., OCTOBER 2022

REVISIONS

No.	DESCRIPTION	DATE	BY	APPROVED

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MARKHAM, ONTARIO L3R 8B8
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TEL: 613.476.2148 EXT. 1023
TEL: 613.962.9108 EXT. 1023

PEC COMMUNITY PARTNERS INC.

PICTON AIRPORT - TERCOT

COUNTY ROAD 22
STA. 2+220 TO 2+500

DATE:	SEPTEMBER 2023	CHECKED BY:	S.S.
SCALE:	H 1:500 V 1:50	DRAWN BY: E.S.	CHECKED BY: S.S.

5 0 10 20 30 40 HORIZONTAL

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF SCS CONSULTING GROUP LTD. CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATION.

Date

PROJECT No: 2365

DRAWING No: 405

DRAFT

Attachment B – Borehole Logs (Palmer, 2022)

LOG OF BOREHOLE BH21-01

PROJECT: Phase II ESA - Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Acquisitions Limited
Method: Hollow Stem Augers/Air Hammer Crush
ENCL NO.: 1
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
Diameter: 205 mm
ORIGINATED BY TO
DATUM: Geodetic
Date: Jun-03-2021
COMPILED BY CS
BH LOCATION: See Borehole Location Plan

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
147.5 / 0.0	Ground Surface								
147.4 / 0.1	**TOPSOIL:** 100 mm		1	SS			Analysis: PHCs, VOCs, metals		Concrete
147.1 / 0.3	**DISTURBED NATIVE (FILL):** gravelly clayey silt, trace sand, trace rootlets, contain cobbles and boulders, brown, moist								
	ROCK CRUSHING BY AIR HAMMER								Cement Grout
							Analysis (GW): PHCs, BTEX, PAH		Sand W. L. 146.1 m Sep 09, 2021
									Screen
142.9 / 4.6	**END OF BOREHOLE**								

Notes:
1. Upon completion of drilling, a 50mm diameter monitoring wells were installed in the borehole.
2. Water Level Readings:

Date	W. L. Depth (mBGS)
June 10, 2021	1.49

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH21-02

PROJECT: Phase II ESA - Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Acquisitions Limited
Method: Hollow Stem Augers/NQ Coring
ENCL NO.: 2
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
Diameter: 205 mm/76 mm
ORIGINATED BY TO
DATUM: Geodetic
Date: Jun-02-2021
COMPILED BY CS
BH LOCATION: See Borehole Location Plan

ELEV / DEPTH (m)	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
147.6 / 0.0	Ground Surface								
147.6 / 0.0	**TOPSOIL:** 40 mm								
	DISTURBED NATIVE (FILL): gravelly silty clay, trace sand, trace rootlets, contain cobbles and boulders, brown, moist, very stiff to hard		1	SS			Analysis: PHCs, VOCs, metals		Concrete
147.0 / 0.6			2	SS	Auger grinding and spoon bouncing				
	ROCK CRUSHING BY AIR HAMMER						Analysis (GW): PHCs, BTEX, PAH		Cement Grout
									W. L. 146.3 m Sep 09, 2021
									Sand
									Screen
142.6 / 5.0	**END OF BOREHOLE**								

Notes:
1. Upon completion of drilling, a 50mm diameter monitoring wells were installed in the borehole.
2. Water Level Readings:

Date	W. L. Depth (mBGS)
June 10, 2021	1.35

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH21-03

PROJECT: Phase II ESA - Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Acquisitions Limited
Method: Hollow Stem Augers/Air Hammer Crush
ENCL NO.: 3
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
Diameter: 205 mm
ORIGINATED BY TO
DATUM: Geodetic
Date: Jun-03-2021
COMPILED BY CS
BH LOCATION: See Borehole Location Plan

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
147.5 Ground Surface						3 6 9 12 15			
147.4 0.1	**TOPSOIL:** 75 mm								Concrete
	DISTURBED NATIVE (FILL): gravelly silty clay, trace sand, trace rootlets, contain cobbles and boulders, brown, moist, hard		1	SS		Hex	Analysis: PHCs, VOCs, metals		
146.7 0.8	**ROCK CRUSHING BY AIR HAMMER**				Auger grinding				Cement Grout
1									Sand
2									
3									Screen
4							Analysis (GW): PHCs, VOCs, metals		W. L. 143.3 m Sep 09, 2021
142.9 4.6	**END OF BOREHOLE**								

Notes:
1. Upon completion of drilling, a 50mm diameter monitoring wells were installed in the borehole.
2. Water Level Readings:

Date	W. L. Depth (mBGS)
June 10, 2021	1.49

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH21-04

PROJECT: Phase II ESA - Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Acquisitions Limited
Method: Hollow Stem Augers/Air Hammer Crush
ENCL NO.: 4
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
Diameter: 205 mm
ORIGINATED BY TO
DATUM: Geodetic
Date: Jun-03-2021
COMPILED BY CS
BH LOCATION: See Borehole Location Plan

ELEV / DEPTH (m)	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
147.6 0.0	Ground Surface					3 6 9 12 15			
147.5 0.1	**TOPSOIL:** 100 mm								Concrete
147.1 0.5	**DISTURBED NATIVE (FILL):** gravelly silty clay, trace sand, trace rootlets, contain cobbles and boulders, brown, moist, hard		1	SS			Analysis: PHCs, VOCs, metals		
	ROCK CRUSHING BY AIR HAMMER				Auger grinding				Cement Grout
1									Sand
							Analysis (GW): PHCs, VOCs, PAHs, metals		W. L. 146.0 m Sep 09, 2021
2									
3									Screen
4									
143.0 4.6	**END OF BOREHOLE**								

Notes:
1. Upon completion of drilling, a 50mm diameter monitoring wells were installed in the borehole.
2. Water Level Readings:

Date	W. L. Depth (mBGS)
June 10, 2021	1.49

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH21-05

PROJECT: Phase II ESA - Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Acquisitions Limited
Method: Hollow Stem Augers/NQ Coring
ENCL NO.: 5
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
Diameter: 205 mm/76 mm
ORIGINATED BY TO
DATUM: Geodetic
Date: Jun-02-2021
COMPILED BY CS
BH LOCATION: See Borehole Location Plan

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
147.0 Ground Surface						3 6 9 12 15			
146.9 0.0	**TOPSOIL:** 80 mm								Concrete
146.8 0.1	**DISTURBED NATIVE (FILL):** gravelly silty clay, trace sand, trace rootlets, contain cobbles and boulders, brown, moist, firm to hard		1	SS			Analysis: PHCs, VOCs, metals		
146.3 0.8	**ROCK CORING STARTS, REFER TO ROCK CORE LOG**		2	SS	Auger grinding and spoon bouncing		Analysis: PAHs		Cement Grout
1									Sand
2									
3							Analysis (GW): PHCs, VOCs, PAHs, metals		W. L. 144.4 m Sep 09, 2021
4									Screen
142.2 4.8	**END OF BOREHOLE** Notes: 1. Upon completion of drilling, a 50mm diameter monitoring wells were installed in the borehole. 2. Water Level Readings: Date W. L. Depth (mBGS) June 10, 2021 3.06								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH21-06

PROJECT: Phase II ESA - Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Acquisitions Limited
Method: Hollow Stem Augers/Air Hammer Crush
ENCL NO.: 6
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
Diameter: 205 mm
ORIGINATED BY TO
DATUM: Geodetic
Date: Jun-04-2021
COMPILED BY CS
BH LOCATION: See Borehole Location Plan

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
146.7	Ground Surface					3 6 9 12 15			
0.0	**DISTURBED NATIVE (FILL):** gravelly sandy silt, trace clay, trace rootlets, contain cobbles and boulders, brown, moist		1	SS	Auger grinding		Analysis: PHCs, BETX		Concrete
146.1									
0.6	**DISTURBED NATIVE (FILL):** clayey silt, trace sand, trace gravel, trace rootlets, contain cobbles and boulders, brown, moist		2	SS			Analysis: PAHs		Cement Grout
145.6									
1.1	**ROCK CRUSHING BY AIR HAMMER**								Sand
142.1							Analysis (GW): PHCs, VOCs, PAHs, metals		Screen
4.6	**END OF BOREHOLE**								W. L. 142.7 m Sep 09, 2021

Notes:
1. Upon completion of drilling, a 50mm diameter monitoring wells were installed in the borehole.
2. Water Level Readings:

Date	W. L. Depth (mBGS)
June 10, 2021	1.54

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH21-07

PROJECT: Phase II ESA - Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Acquisitions Limited
Method: Hollow Stem Augers/Air Hammer Crush
ENCL NO.: 7
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
Diameter: 205 mm
ORIGINATED BY TO
DATUM: Geodetic
Date: Jun-04-2021
COMPILED BY CS
BH LOCATION: See Borehole Location Plan

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
146.9	Ground Surface								
146.8	**TOPSOIL:** 100 mm								
0.1 / 146.3	**DISTURBED NATIVE (FILL):** gravelly sandy silt, trace clay, trace rootlets, contain cobbles and boulders, brown, moist		1	SS			Analysis: metals		Concrete
0.6 / 145.7	**DISTURBED NATIVE (FILL):** sand and gravel, trace clay, trace silt, contain cobbles and boulders, brown, moist		2	SS			Analysis: PHCs, VOCs		
1.2 / 144.5	**DISTURBED NATIVE (FILL):** gravelly sandy silt, trace clay, contain cobbles and boulders, brown, moist		3	SS					Cement Grout
			4	SS					
2.4 / 140.8	**ROCK CRUSHING BY AIR HAMMER**				Auger grinding		Analysis (GW): PHCs, VOCs, PAHs, metals		Sand Screen W. L. 141.3 m Sep 09, 2021
6.1	**END OF BOREHOLE** Notes: 1. Upon completion of drilling, a 50mm diameter monitoring wells were installed in the borehole. 2. Water Level Readings: Date W. L. Depth (mBGS) June 10, 2021 1.54								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH21-08

PROJECT: Phase II ESA - Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Acquisitions Limited
Method: Hollow Stem Augers/Air Hammer Crush
ENCL NO.: 8
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
Diameter: 205 mm
ORIGINATED BY TO
DATUM: Geodetic
Date: Jun-03-2021
COMPILED BY CS
BH LOCATION: See Borehole Location Plan

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
143.3	Ground Surface								
143.2 / 0.1	**TOPSOIL:** 50 mm		1	SS			Analysis: PHCs, BETX, PAHs		Concrete
143.0 / 0.3	**DISTURBED NATIVE (FILL):** gravelly sandy silt, trace clay, trace rootlets, contain cobbles and boulders, brown, moist				Auger grinding				
	ROCK CRUSHING BY AIR HAMMER								Cement Grout
							Analysis (GW): PHCs, BTEX, PAHs		W. L. 142.0 m Sep 09, 2021
									Screen
138.7 / 4.6	**END OF BOREHOLE**								

Notes:
1. Upon completion of drilling, a 50mm diameter monitoring wells were installed in the borehole.
2. Water Level Readings:

Date	W. L. Depth (mBGS)
June 10, 2021	1.49

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH21-09

PROJECT: Phase II ESA - Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Acquisitions Limited
Method: Hollow Stem Augers/Air Hammer Crush
ENCL NO.: 9
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
Diameter: 205 mm
ORIGINATED BY TO
DATUM: Geodetic
Date: Jun-04-2021
COMPILED BY CS
BH LOCATION: See Borehole Location Plan

ELEV / DEPTH (m)	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
143.9 0.0	Ground Surface								
143.8 0.1	**ASPHALT:** 50 mm								Concrete
143.6 0.3	**FILL:** silty sand, trace clay, some gravel, trace rootlets, brown, moist		1	SS			Analysis: PHCs, VOCs, metals		
143.3 0.6	**DISTURBED NATIVE (FILL):** gravelly clayey silt, trace sand, trace rootlets, contain cobbles and boulders, brown, moist		2	SS	Auger grinding		Analysis: PAHs		Cement Grout
1	**ROCK CRUSHING BY AIR HAMMER**								Sand
2									
3									Screen
4									W. L. 139.8 m Sep 09, 2021
139.3 4.6	**END OF BOREHOLE**								

Notes:
1. Upon completion of drilling, a 50mm diameter monitoring wells were installed in the borehole.
2. Water Level Readings:

Date	W. L. Depth (mBGS)
June 10, 2021	1.49

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH21-10

PROJECT: Phase II ESA - Picton Airport
CLIENT: Tercot Acquisitions Limited
PROJECT LOCATION: 343 County Road 22, Picton, Prince Edward County, ON
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

Method: Hollow Stem Augers/NQ Coring
Diameter: 205 mm/76 mm
Date: Jun-01-2021

REF. NO.: 1510436
ENCL NO.: 10
ORIGINATED BY TO
COMPILED BY CS

ELEV (m) / DEPTH	SOIL PROFILE – DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
143.8	Ground Surface								
143.8 / 0.1	**TOPSOIL:** 50 mm								
	DISTURBED NATIVE (FILL): sandy silt, some clay, some gravel, trace rootlets, contain cobbles and boulders, brown, moist, compact to loose		1	SS					
			2	SS		IBL	Analysis: metals		
142.6 / 1.2	**ROCK CORING STARTS, REFER TO ROCK CORE LOG**				Spoon Bouncing and auger grinding				
139.0 / 4.8	**END OF BOREHOLE** Notes: 1. Borehole was open upon completion of drilling.								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE 21-11

PROJECT: Geotechnical Investigation_Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Development Group
Method: Hollow Stem Augers/NQ Coring
ENCL NO.:
PROJECT LOCATION: Picton, Prince Edward County, ON
Diameter:
ORIGINATED BY CS
DATUM: Geodetic
Date: Sep-08-2021
BH LOCATION: N 4878375.865 E 809238.219

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
146.6 Ground Surface									
146.6 / 0.0	**TOPSOIL:**								
146.5 / 0.1	**FILL:** Brown sandy silt, trace clay, some gravel, trace rootlets		1	SS	Analysis: PAH		Analysis: PAHs		Concrete
146.0 / 0.6	**ROCK CORING STARTS, Limestone**								Cement Grout
							Analysis (GW): PHCs, VOCs, PAHs, metals		Sand W. L. 145.0 m Sep 09, 2021
									Screen
142.1 / 4.6	**END OF BOREHOLE** Notes: 1. Borehole was open upon completion of drilling. 2, Well installed at 4.57 m								

Head Space Combustible Vapor Reading (ppm) scale: 3, 6, 9, 12, 15

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

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LOG OF BOREHOLE 21-12

PROJECT: Geotechnical Investigation_Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Development Group
Method: Hollow Stem Augers/NQ Coring
ENCL NO.:
PROJECT LOCATION: Picton, Prince Edward County, ON
Diameter:
ORIGINATED BY CS
DATUM: Geodetic
Date: Sep-08-2021
BH LOCATION: N 4878353.265 E 809181.643

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
146.9	Ground Surface					3 6 9 12 15			
0.0	**Straight Auger and rock coring to 6.10 m for well install**								Concrete
1									Cement Grout
2									Sand
3									
4									Screen
5									
6									
140.8									
6.1	**END OF BOREHOLE** Notes: 1. Borehole was open upon completion of drilling. 2, Well installed at 6.10 m								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3 , × 3 : Numbers refer to Sensitivity ○ ε=3% Strain at Failure

Palmer

LOG OF BOREHOLE 21-13

PROJECT: Geotechnical Investigation_Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Development Group
Method: Hollow Stem Augers/NQ Coring
ENCL NO.:
PROJECT LOCATION: Picton, Prince Edward County, ON
Diameter:
ORIGINATED BY CS
DATUM: Geodetic
Date: Sep-08-2021
BH LOCATION: N 4878348.181 E 809176.878

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
146.9	Ground Surface					3 6 9 12 15			
0.0	**Straight Auger and rock coring to 4.57 m for well install**								Concrete
									Cement Grout
							Analysis (GW): PHCs, VOCs, PAHs, metals		Sand W. L. 145.3 m Sep 09, 2021
									Screen
142.3									
4.6	**END OF BOREHOLE** Notes: 1. Borehole was open upon completion of drilling. 2, Well installed at 4.57 m								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3 , × 3 : Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE 21-14

PROJECT: Geotechnical Investigation_Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Development Group
Method: Hollow Stem Augers/NQ Coring
ENCL NO.:
PROJECT LOCATION: Picton, Prince Edward County, ON
Diameter:
ORIGINATED BY CS
DATUM: Geodetic
Date: Sep-08-2021
BH LOCATION: N 4878341.192 E 809238.624

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
146.6	Ground Surface								
146.6 / 0.0	**TOPSOIL:**								
0.1	**FILL:** Brown sand and gravel, some silt, trace clay, trace rootlets		1	SS	Analysis: PAH		Analysis: PAHs		
146.1									
0.5	**END OF BOREHOLE** Notes: 1. Refual at 0.46 m.								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

PROJECT: Geotechnical Investigation_Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Development Group
Method: Hollow Stem Augers/NQ Coring
ENCL NO.:
PROJECT LOCATION: Picton, Prince Edward County, ON
Diameter:
ORIGINATED BY CS
DATUM: Geodetic
Date: Sep-08-2021
BH LOCATION: N 4878354.407 E 809262.332

SOIL PROFILE (m) ELEV / DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
146.6	Ground Surface								
146.5	**TOPSOIL:**		1	SS	Analysis: PAH		Analysis: PAHs		
146.3	**FILL:** Brown silty sand, some gravel, trace clay, trace rootlets								
0.3	**END OF BOREHOLE** Notes: 1. Refual at 0.30 m.								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Geotechnical Investigation_Picton Airport
REF. NO.: 1510436
CLIENT: Tercot Development Group
Method: Hollow Stem Augers/NQ Coring
ENCL NO.:
PROJECT LOCATION: Picton, Prince Edward County, ON
Diameter:
ORIGINATED BY CS
DATUM: Geodetic
Date: Sep-08-2021
BH LOCATION: N 4878385.648 E 809272.28

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
146.8	Ground Surface								
146.7 / 0.1	**TOPSOIL:**								
	FILL: Brown silty sand, some gravel, trace clay, trace rootlets		1	SS					
145.9			2	SS	Analysis: PAH		Analysis: PAHs		
0.9	**END OF BOREHOLE** Notes: 1. Refual at 0.91 m.								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3 , × 3 : Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PALMER-ENV_JUNE-2020.GLB PALMER_ENVIRO-SOIL W DOC 0+16 PPM-2020 1510436_PICTON AIRPORT_20210907.GPJ 21-9-30

LOG OF BOREHOLE BH22-1

PROJECT: Phase II ESA
REF. NO.: 1510436
CLIENT: PEC Community Partners Inc
Method: Air rotary
ENCL NO.: 1
PROJECT LOCATION: Picton Airport, Picton, ON
Diameter:
ORIGINATED BY SS
DATUM: Geodetic
Date: Mar-02-2022
BH LOCATION: See Borehole Location Plan

SOIL PROFILE			SAMPLES						
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
	Ground Surface								
0.0	**Soil lithology was not collected at this location:**				Black staining				Concrete
0.6	**ROCK CRUSHING BY AIR HAMMER**						Analysis: PHCs, BTEX		Bentonite Sand W. L. 2.0 mBGL Mar 08, 2022 Screen
4.6	**END OF BOREHOLE** Notes: 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Borehole was open upon completion of drilling. 3. Water Level Readings: Date W. L. Depth (mBGS) March 9, 2022 3.46								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH22-2

PROJECT: Phase II ESA
REF. NO.: 1510436
CLIENT: PEC Community Partners Inc
Method: Air rotary
ENCL NO.: 2
PROJECT LOCATION: Picton Airport, Picton, ON
Diameter:
ORIGINATED BY SS
DATUM: Geodetic
Date: Mar-02-2022
BH LOCATION: See Borehole Location Plan

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
	Ground Surface					3 6 9 12 15			
0.0	**Soil lithology was not collected at this location:**								
0.5	**ROCK CRUSHING BY AIR HAMMER**								Cement
									Bentonite

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ 8=3% Strain at Failure

PROJECT: Phase II ESA
REF. NO.: 1510436
CLIENT: PEC Community Partners Inc
Method: Air rotary
ENCL NO.: 2
PROJECT LOCATION: Picton Airport, Picton, ON
Diameter:
ORIGINATED BY SS
DATUM: Geodetic
Date: Mar-02-2022
BH LOCATION: See Borehole Location Plan

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
	Continued								
9									Sand
10									
11									Screen
12									
12.2	**END OF BOREHOLE** Notes: 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Borehole was open upon completion of drilling. 3. Well was found dry.								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^{3}$, $\times^{3}$: Numbers refer to Sensitivity; ○ ^{8}=3% Strain at Failure

LOG OF BOREHOLE BH22-3

PROJECT: Phase II ESA
REF. NO.: 1510436
CLIENT: PEC Community Partners Inc
Method: Air rotary
ENCL NO.: 3
PROJECT LOCATION: Picton Airport, Picton, ON
Diameter:
ORIGINATED BY SS
DATUM: Geodetic
Date: Mar-03-2022
BH LOCATION: See Borehole Location Plan

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
	Ground Surface					3 6 9 12 15			
0.0	**Soil lithology was not collected at this location:**								Concrete
0.6	**ROCK CRUSHING BY AIR HAMMER**						Analysis: PHCs, BTEX		Bentonite Sand W. L. 2.6 mBGL Mar 08, 0202 Screen
4.6	**END OF BOREHOLE** Notes: 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Borehole was open upon completion of drilling. 3. Water Level Readings:Date W. L. Depth (mBGS) March 9, 2022 3.60								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

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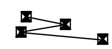
LOG OF BOREHOLE BH22-4

PROJECT: Phase II ESA | REF. NO.: 1510436
CLIENT: PEC Community Partners Inc | Method: Air rotary | ENCL NO.: 4
PROJECT LOCATION: Picton Airport, Picton, ON | Diameter: | ORIGINATED BY SS
DATUM: Geodetic | Date: Mar-03-2022
BH LOCATION: See Borehole Location Plan

SOIL PROFILE: (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
	Ground Surface					3 6 9 12 15			
0.0	**Soil lithology was not collected at this location:**								Concrete
0.3	**ROCK CRUSHING BY AIR HAMMER**						Analysis: PHCs, VOCs, PAHs	W. L. 1.4 mBGL Mar 08, 2022	Bentonite; Sand; Screen
4.6	**END OF BOREHOLE** Notes: 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Borehole was open upon completion of drilling. 3. Water Level Readings:Date W. L. Depth (mBGS) March 9, 2022 2.35								



GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ 8 =3% Strain at Failure

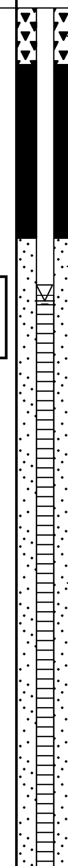
LOG OF BOREHOLE BH22-5

PROJECT: Phase II ESA
CLIENT: PEC Community Partners Inc
PROJECT LOCATION: Picton Airport, Picton, ON
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

Method: Air rotary
Diameter:
Date: Mar-03-2022

REF. NO.: 1510436
ENCL NO.: 5
ORIGINATED BY SS

(m) ELEV DEPTH	SOIL PROFILE – DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
	Ground Surface					3 6 9 12 15			
0.0	**Soil lithology was not collected at this location:**						Analysis: PHCs, VOCs, PAHs	W. L. 1.6 mBGL Mar 08, 2022	Concrete; Bentonite; Sand; Screen
2.1	**ROCK CRUSHING BY AIR HAMMER**								
4.6	**END OF BOREHOLE** Notes: 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Borehole was open upon completion of drilling. 3. Water Level Readings:Date W. L. Depth (mBGS) March 9, 2022 2.89								



GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH22-6

PROJECT: Phase II ESA
CLIENT: PEC Community Partners Inc
PROJECT LOCATION: Picton Airport, Picton, ON
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

Method: Air rotary
Diameter:
Date: Mar-01-2022

REF. NO.: 1510436
ENCL NO.: 6
ORIGINATED BY SS

(m) ELEV DEPTH	SOIL PROFILE – DESCRIPTION	STRATA PLOT	SAMPLES – NUMBER	SAMPLES – TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
	Ground Surface								
0.0	**Soil lithology was not collected at this location:**								
0.5	**ROCK CRUSHING BY AIR HAMMER**								Cement
									Bentonite

Depth scale (m): 1, 2, 3, 4, 5, 6, 7, 8

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ 8=3% Strain at Failure

PROJECT: Phase II ESA
CLIENT: PEC Community Partners Inc
PROJECT LOCATION: Picton Airport, Picton, ON
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

Method: Air rotary
Diameter:
Date: Mar-01-2022

REF. NO.: 1510436
ENCL NO.: 6
ORIGINATED BY SS

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
9 10 11 12	Continued								Sand Screen
12.2	**END OF BOREHOLE** Notes: 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Borehole was open upon completion of drilling. 3. Well was found dry upon completion.								

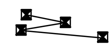
PALMER-ENV_JUNE-2020.GLB PALMER ENVIRO-SOIL/W VOC 0~18 PPM-2020 PICTON AIRPORT BH LOGS.GPJ 22-4-7

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ 8=3% Strain at Failure

PROJECT: Phase II ESA | REF. NO.: 1510436
CLIENT: PEC Community Partners Inc | Method: Air rotary | ENCL NO.: 7
PROJECT LOCATION: Picton Airport, Picton, ON | Diameter: | ORIGINATED BY SS
DATUM: Geodetic | Date: Mar-01-2022
BH LOCATION: See Borehole Location Plan

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
	Ground Surface								
0.0	**Soil lithology was not collected at this location:**								
0.5	**ROCK CRUSHING BY AIR HAMMER**								Cement
									Bentonite



Depth scale: 1, 2, 3, 4, 5, 6, 7, 8

Continued Next Page

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

PALMER-ENV_JUNE-2020.GLB
PALMER_ENVIRO-SOIL/W VOC 0~18 PPM-2020_PICTON AIRPORT BH LOGS.GPJ 22-4-7

PROJECT: Phase II ESA
CLIENT: PEC Community Partners Inc
PROJECT LOCATION: Picton Airport, Picton, ON
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

Method: Air rotary
Diameter:
Date: Mar-01-2022

REF. NO.: 1510436
ENCL NO.: 7
ORIGINATED BY SS

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
9 10 11 12	Continued								Sand Screen
12.2	**END OF BOREHOLE** Notes: 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Borehole was open upon completion of drilling. 3. Well was found dry upon completion								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

PROJECT: Phase II ESA
CLIENT: PEC Community Partners Inc
PROJECT LOCATION: Picton Airport, Picton, ON
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

Method: Air rotary
Diameter:
Date: Mar-02-2022

REF. NO.: 1510436
ENCL NO.: 8
ORIGINATED BY SS

(m) ELEV / DEPTH	SOIL PROFILE – DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) (3, 6, 9, 12, 15)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
	Ground Surface								
0.0	**Topsoil:**								
0.1	**Fill** Brown stiff moist clayey silt, some sand		1	SS					
0.6	**Fill** Gray stiff moist sandy silt, bourlders throughout								
1.2	**END OF BOREHOLE**								

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity

○ ε=3% Strain at Failure

Palmer

LOG OF BOREHOLE BH22-9

PROJECT: Phase II ESA
CLIENT: PEC Community Partners Inc
PROJECT LOCATION: Picton Airport, Picton, ON
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

Method: Air rotary
Diameter:
Date: Mar-08-2022

REF. NO.: 1510436
ENCL NO.: 9
ORIGINATED BY SS

(m) ELEV DEPTH	SOIL PROFILE – DESCRIPTION	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm)	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS / WELL CONSTRUCTION DETAILS
	Ground Surface						
0.0	**Topsoil:**						Concrete
0.1	**Fill** Stiff brown moist silty sand	1	SS				
0.3	**Fill** Hard brown dry silty lay						Bentonite
0.6	**ROCK CRUSHING BY AIR HAMMER**					Analysis: PHCs, VOCs, PAHs	Sand; W. L. 1.5 mBGL Mar 08, 2022; Screen
4.6	**END OF BOREHOLE**						

Head Space Combustible Vapor Reading scale: 3, 6, 9, 12, 15

Depth scale: 1, 2, 3, 4

Notes:
1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole.
2. Borehole was open upon completion of drilling.
3. Water Level Readings:Date W. L. Depth (mBGS)
March 9, 2022 1.66

PALMER-ENV_JUNE-2020.GLB
PALMER_ENVIRO-SOIL/W VOC 0~18 PPM-2020 PICTON AIRPORT BH LOGS.GPJ 22-4-7

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

Palmer

LOG OF BOREHOLE BH22-10

PROJECT: Phase II ESA
REF. NO.: 1510436
CLIENT: PEC Community Partners Inc
Method: Air rotary
ENCL NO.: 10
PROJECT LOCATION: Picton Airport, Picton, ON
Diameter:
ORIGINATED BY SS
DATUM: Geodetic
Date: Mar-02-2022
BH LOCATION: See Borehole Location Plan

SOIL PROFILE			SAMPLES			Head Space Combustible Vapor Reading (ppm)			
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	SAMPLE REMARKS	3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
Ground Surface									
0.0 / 0.1	**Topsoil:**								
	Fill Stiff brown moist clayey silt, rootlets								
0.3	**Fill** Dray loose dry sand and gravel		1	SS					
1 0.9	**END OF BOREHOLE**								

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ 3=3% Strain at Failure

Palmer

LOG OF BOREHOLE BH22-11

PROJECT: Phase II ESA
REF. NO.: 1510436
CLIENT: PEC Community Partners Inc
Method: Air rotary
ENCL NO.: 11
PROJECT LOCATION: Picton Airport, Picton, ON
Diameter:
ORIGINATED BY SS
DATUM: Geodetic
Date: Mar-03-2022
BH LOCATION: See Borehole Location Plan

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLE REMARKS	Head Space Combustible Vapor Reading (ppm) 3 6 9 12 15	LABORATORY ANALYSIS AND REMARKS	GROUND WATER CONDITIONS	WELL CONSTRUCTION DETAILS
	Ground Surface								
0.0 / 0.1	**Topsoil:**								
	Fill Stiff moist silty clay, some gravel		1	SS					Concrete
0.3	**ROCK CRUSHING BY AIR HAMMER**								Bentonite
							Analysis: PHCs, BTEX	▽	Sand; W. L. 1.4 mBGL Mar 08, 2022
									Screen
4.6	**END OF BOREHOLE** Notes: 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Borehole was open upon completion of drilling. 3. Water Level Readings:Date W. L. Depth (mBGS) March 9, 2022 1.03								

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

Attachment C – Groundwater Level Data (Palmer, 2022)

Summary of Groundwater Levels

Monitoring Well ID	Date	Ground Surface Elevation (mAMSL)	Depth to GW (mbgs)	GW Elevation (mAMSL)
MW2	31-May-21	143.34	1.75	141.59
	01-Jun-21		4.31	139.03
	02-Jun-21		4.19	139.15
	03-Jun-21		1.32	142.02
	04-Jun-21		1.42	141.92
	10-Jun-21		1.72	141.62
	09-Sep-21		1.58	141.76
	08-Mar-22		1.64	142.53
	09-Mar-22		1.62	142.55
	22-Mar-22		2.02	142.15
MW3	31-May-21	146.81	Dry	-
	01-Jun-21		Dry	-
	02-Jun-21		Dry	-
	03-Jun-21		Dry	-
	04-Jun-21		Dry	-
	10-Jun-21		Dry	-
	09-Sep-21		Dry	-
	08-Mar-22		Dry	-
	09-Mar-22		Dry	-
	22-Mar-22		13.38	133.43
MW4	31-May-21	147.3	1.58	145.72
	01-Jun-21		1.72	145.58
	02-Jun-21		1.72	145.58
	03-Jun-21		1.50	145.80
	04-Jun-21		1.46	145.84
	10-Jun-21		1.50	145.80
	09-Sep-21		1.44	145.86
	08-Mar-22		1.43	145.87
	09-Mar-22		1.43	145.87
	22-Mar-22		1.35	145.95
MW5	31-May-21	147.45	1.50	145.93
	01-Jun-21		1.52	145.91
	02-Jun-21		1.53	145.90

Monitoring Well ID	Date	Ground Surface Elevation (mAMSL)	Depth to GW (mbgs)	GW Elevation (mAMSL)
	03-Jun-21		1.32	146.11
	04-Jun-21		1.14	146.29
	10-Jun-21		1.27	146.18
	09-Sep-21		1.21	146.24
	08-Mar-22		1.07	146.38
	09-Mar-22		1.05	146.40
	22-Mar-22		0.72	146.73
MW101	31-May-21	147.35	1.50	145.85
	01-Jun-21		1.51	145.84
	02-Jun-21		1.51	145.84
	03-Jun-21		1.15	146.20
	04-Jun-21		1.22	146.13
	10-Jun-21		1.37	145.98
	09-Sep-21		1.29	146.06
	08-Mar-22		2.28	145.07
	09-Mar-22		2.25	145.10
	22-Mar-22		1.97	145.38
MW102	31-May-21	147.29	1.42	145.86
	01-Jun-21		1.38	145.90
	02-Jun-21		1.37	145.91
	03-Jun-21		0.97	146.31
	04-Jun-21		0.97	146.31
	10-Jun-21		1.11	146.17
	09-Sep-21		0.99	146.29
	08-Mar-22		1.46	146.68
	09-Mar-22		1.48	146.66
	22-Mar-22		1.38	146.76
MW103	31-May-21	147.48	1.51	145.96
	01-Jun-21		1.52	145.95
	02-Jun-21		1.52	145.95
	03-Jun-21		1.35	146.12
	04-Jun-21		1.45	146.02
	10-Jun-21		1.48	145.99
	09-Sep-21		1.39	146.08

Monitoring Well ID	Date	Ground Surface Elevation (mAMSL)	Depth to GW (mbgs)	GW Elevation (mAMSL)
	08-Mar-22		1.69	146.65
	09-Mar-22		1.66	146.68
	22-Mar-22		1.74	146.60
MW104	31-May-21	147.55	1.55	145.99
	01-Jun-21		1.57	145.97
	02-Jun-21		2.89	144.65
	03-Jun-21		1.45	146.09
	04-Jun-21		1.51	146.03
	10-Jun-21		1.53	146.01
	09-Sep-21		1.54	146.01
	08-Mar-22		2.45	146.03
	09-Mar-22		2.45	146.03
	22-Mar-22		2.41	146.07
MW201	31-May-21	147.24	2.43	144.80
	01-Jun-21		2.43	144.80
	02-Jun-21		2.43	144.80
	03-Jun-21		2.29	144.94
	04-Jun-21		2.32	144.91
	10-Jun-21		2.39	144.84
	09-Sep-21		2.39	144.84
	08-Mar-22		2.08	145.15
	09-Mar-22		2.06	145.17
	22-Mar-22		2.05	145.18
MW202	31-May-21	147.18	2.43	144.75
	01-Jun-21		2.43	144.75
	02-Jun-21		4.26	142.92
	03-Jun-21		1.87	145.31
	04-Jun-21		2.36	144.82
	10-Jun-21		2.42	144.76
	09-Sep-21		2.42	144.76
	08-Mar-22		3.27	144.77
	09-Mar-22		3.26	144.78
	22-Mar-22		2.72	145.32
MW203	31-May-21	146.95	1.63	145.32

Monitoring Well ID	Date	Ground Surface Elevation (mAMSL)	Depth to GW (mbgs)	GW Elevation (mAMSL)
	01-Jun-21		1.6	145.35
	02-Jun-21		4.46	142.49
	03-Jun-21		4.33	142.62
	04-Jun-21		3.85	143.10
	10-Jun-21		1.92	145.03
	09-Sep-21		1.86	145.09
	08-Mar-22		2.10	145.68
	09-Mar-22		2.11	145.67
	22-Mar-22		1.55	146.23
MW204	31-May-21	146.99	1.39	145.60
	01-Jun-21		1.38	145.61
	02-Jun-21		1.37	145.62
	03-Jun-21		0.74	146.25
	04-Jun-21		0.82	146.17
	10-Jun-21		1.10	145.89
	09-Sep-21		0.99	146.00
	08-Mar-22		2.06	145.80
	09-Mar-22		2.09	145.77
	22-Mar-22		1.39	146.47
MW205	31-May-21	147.4	2.20	145.19
	01-Jun-21		2.21	145.18
	02-Jun-21		4.67	142.72
	03-Jun-21		Dry	-
	04-Jun-21		4.86	142.53
	10-Jun-21		4.45	142.94
	09-Sep-21		4.33	143.06
	08-Mar-22		2.94	145.38
	09-Mar-22		2.84	145.48
	22-Mar-22		2.89	145.43
MW206	31-May-21	147.24	1.54	145.69
	01-Jun-21		1.53	145.70
	02-Jun-21		1.54	145.69
	03-Jun-21		1.43	145.80
	04-Jun-21		1.48	145.75

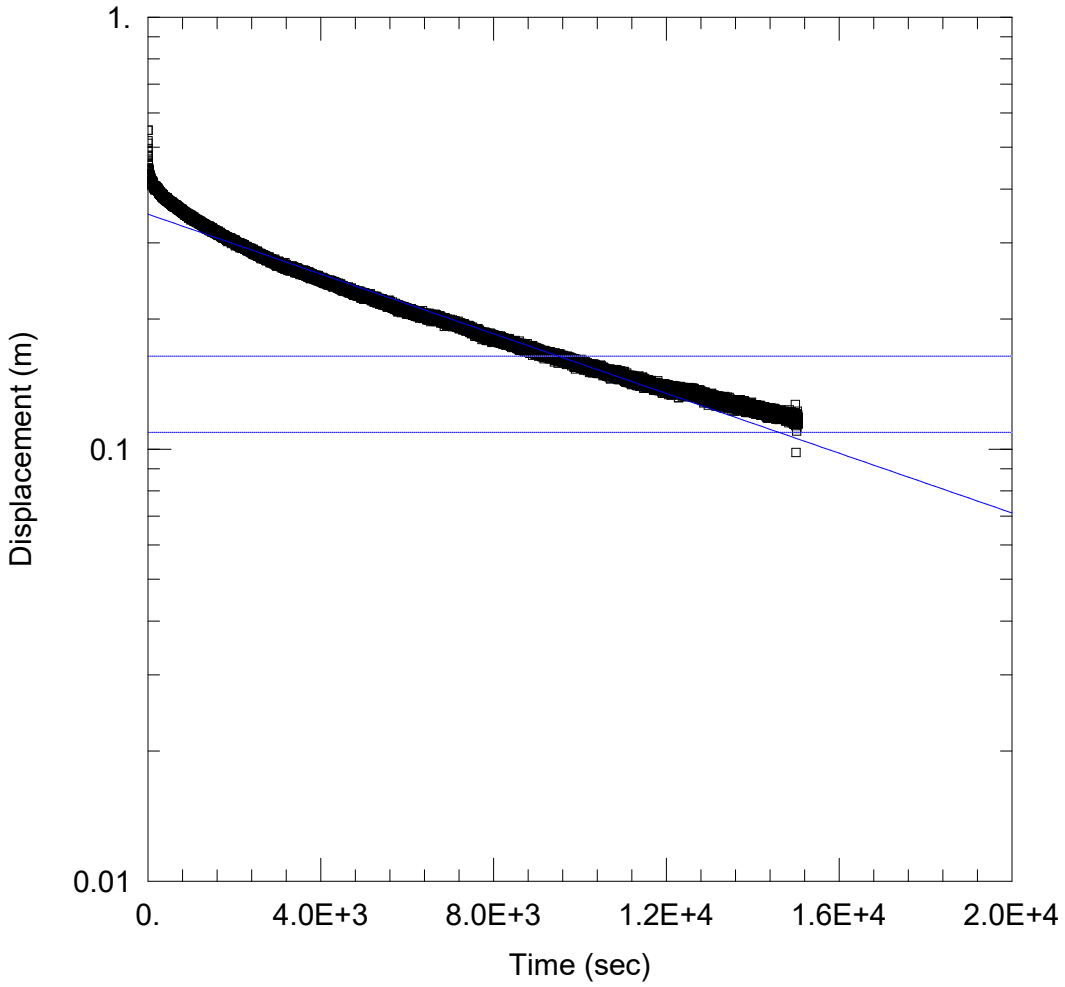
Monitoring Well ID	Date	Ground Surface Elevation (mAMSL)	Depth to GW (mbgs)	GW Elevation (mAMSL)
	10-Jun-21		1.51	145.72
	09-Sep-21		1.45	145.78
	08-Mar-22		2.52	145.67
	09-Mar-22		2.49	145.70
	22-Mar-22		2.48	145.71
MW207	31-May-21	147.47	1.70	145.76
	01-Jun-21		1.71	145.75
	02-Jun-21		1.69	145.77
	03-Jun-21		1.35	146.11
	04-Jun-21		1.29	146.17
	10-Jun-21		1.47	145.99
	09-Sep-21		1.33	146.13
	08-Mar-22		1.90	146.40
	09-Mar-22		1.93	146.37
	22-Mar-22		1.55	146.75
BH21-1	04-Jun-21	147.46	3.00	144.45
	10-Jun-21		1.55	145.90
	09-Sep-21		1.34	146.11
	08-Mar-22		1.73	145.72
	09-Mar-22		1.72	145.73
	22-Mar-22		1.75	145.70
BH21-2	04-Jun-21	147.59	1.26	146.33
	10-Jun-21		1.35	146.24
	09-Sep-21		1.25	146.34
	08-Mar-22		0.92	146.67
	09-Mar-22		0.94	146.65
	22-Mar-22		0.74	146.85
BH21-3	03-Jun-21	147.47	Dry	-
	04-Jun-21		Dry	-
	10-Jun-21		4.35	143.12
	09-Sep-21		4.16	143.31
	08-Mar-22		2.13	145.34
	09-Mar-22		2.09	145.38
	22-Mar-22		1.97	145.50

Monitoring Well ID	Date	Ground Surface Elevation (mAMSL)	Depth to GW (mbgs)	GW Elevation (mAMSL)
BH21-4	03-Jun-21	147.6	1.57	146.03
	04-Jun-21		1.63	145.97
	10-Jun-21		1.64	145.96
	09-Sep-21		1.61	145.99
	08-Mar-22		1.23	146.37
	09-Mar-22		1.21	146.39
	22-Mar-22		1.22	146.38
BH21-5	04-Jun-21	147.01	2.82	144.19
	10-Jun-21		3.06	143.95
	09-Sep-21		2.65	144.36
	08-Mar-22		2.76	144.25
	09-Mar-22		2.76	144.25
	22-Mar-22		2.68	144.33
BH21-6	04-Jun-21	146.67	Dry	-
	10-Jun-21		Dry	-
	09-Sep-21		4.01	142.66
	08-Mar-22		3.91	142.76
	09-Mar-22		3.82	142.85
	22-Mar-22		3.94	142.73
BH21-7	04-Jun-21	146.91	Dry	-
	10-Jun-21		Dry	-
	09-Sep-21		5.63	141.28
	08-Mar-22		5.22	141.69
	09-Mar-22		5.20	141.71
	22-Mar-22		5.19	141.72
BH21-8	03-Jun-21	143.32	1.23	142.08
	04-Jun-21		1.23	142.08
	10-Jun-21		1.64	141.67
	09-Sep-21		1.29	142.02
	08-Mar-22		0.85	142.46
	09-Mar-22		0.85	142.46
	22-Mar-22		1.10	142.21
BH21-9	04-Jun-21	143.87	Dry	-
	10-Jun-21		4.14	139.72

Monitoring Well ID	Date	Ground Surface Elevation (mAMSL)	Depth to GW (mbgs)	GW Elevation (mAMSL)
	09-Sep-21		4.09	139.77
	08-Mar-22		Dry	-
	09-Mar-22		Dry	-
	22-Mar-22		Dry	-
BH21-11	09-Sep-21	146.64	1.68	144.96
	08-Mar-22		1.39	145.25
	09-Mar-22		1.37	145.27
	22-Mar-22		1.28	145.36
BH21-12	09-Sep-21	146.87	Dry	-
	08-Mar-22		6.01	140.86
	09-Mar-22		5.98	140.89
	22-Mar-22		5.88	140.99
BH21-13	09-Sep-21	146.88	1.49	145.39
	08-Mar-22		1.33	145.55
	09-Mar-22		1.32	145.56
	22-Mar-22		1.19	145.69
BH-6	04-Jun-21	140.64	1.4	139.24
	10-Jun-21		1.49	139.15
	09-Sep-21		1.48	139.16
	08-Mar-22		0.96	140.57
	09-Mar-22		0.98	140.55
	22-Mar-22		0.91	140.62
BH-7	04-Jun-21	139.01	1.22	137.78
	10-Jun-21		1.54	137.46
	09-Sep-21		1.52	137.49
	08-Mar-22		1.62	138.33
	09-Mar-22		1.61	138.34
	22-Mar-22		1.63	138.32
BH22-1	08-Mar-22	145.32	3.10	145.13
	09-Mar-22		3.46	144.77
	22-Mar-22		3.15	145.08
BH22-2	08-Mar-22	146.49	Dry	-
	09-Mar-22		Dry	-
	22-Mar-22		Dry	-

Monitoring Well ID	Date	Ground Surface Elevation (mAMSL)	Depth to GW (mbgs)	GW Elevation (mAMSL)
BH22-3	08-Mar-22	147.19	3.37	144.35
	09-Mar-22		3.60	144.12
	22-Mar-22		3.40	144.32
BH22-4	08-Mar-22	148.48	2.36	145.77
	09-Mar-22		2.35	145.78
	22-Mar-22		2.38	145.75
BH22-5	08-Mar-22	147.02	2.53	144.93
	09-Mar-22		2.89	144.57
	22-Mar-22		2.84	144.62
BH22-6	08-Mar-22	147.05	Dry	-
	09-Mar-22		Dry	-
	22-Mar-22		Dry	-
BH22-7	08-Mar-22	146.76	Dry	-
	09-Mar-22		Dry	-
	22-Mar-22		Dry	-
BH22-9	08-Mar-22	146.3	1.45	143.87
	09-Mar-22		1.66	143.66
	22-Mar-22		2.55	142.77
BH22-11	08-Mar-22	145.37	2.39	144.01
	09-Mar-22		1.03	145.37
	22-Mar-22		2.46	143.94

Attachment D – Single Well Response Tests (Palmer, 2023)



WELL TEST ANALYSIS

Data Set: G:\...\BH21-1.aqt
Date: 10/13/23 Time: 11:18:59

PROJECT INFORMATION

Company: Palmer
Project: 1510436
Location: Picton Airport
Test Well: BH21-1
Test Date: 06-Oct-2023

AQUIFER DATA

Saturated Thickness: 2.88 m Anisotropy Ratio (Kz/Kr): 0.1

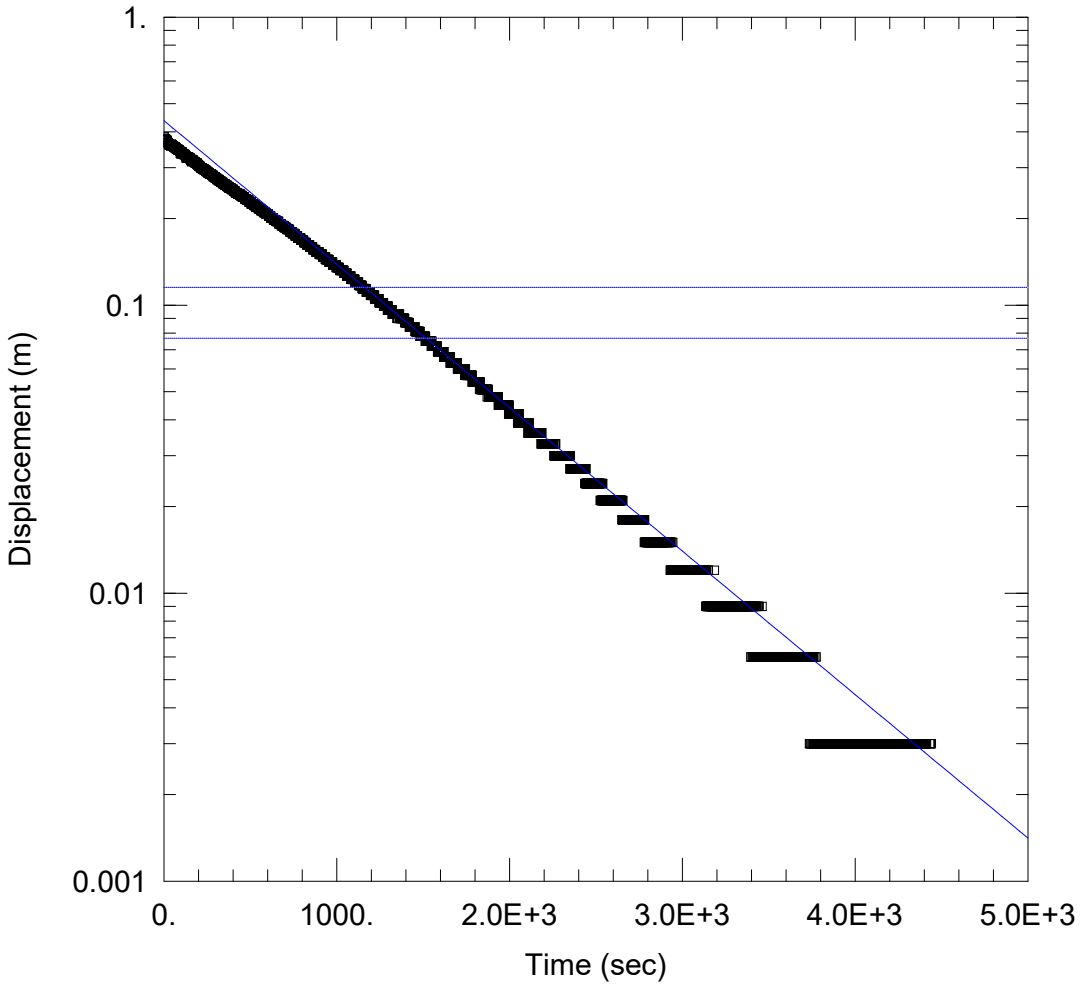
WELL DATA (BH21-1)

Initial Displacement: 0.547 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.88 m
Screen Length: 3.05 m
Well Radius: 0.075 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 2.51E-8 m/sec y0 = 0.3497 m



WELL TEST ANALYSIS

Data Set: G:\...\BH21-5.aqt
Date: 10/13/23 Time: 11:19:20

PROJECT INFORMATION

Company: Palmer
Project: 1510436
Location: Picton Airport
Test Well: BH21-5
Test Date: 06-Oct-2023

AQUIFER DATA

Saturated Thickness: 1.8 m Anisotropy Ratio (Kz/Kr): 0.1

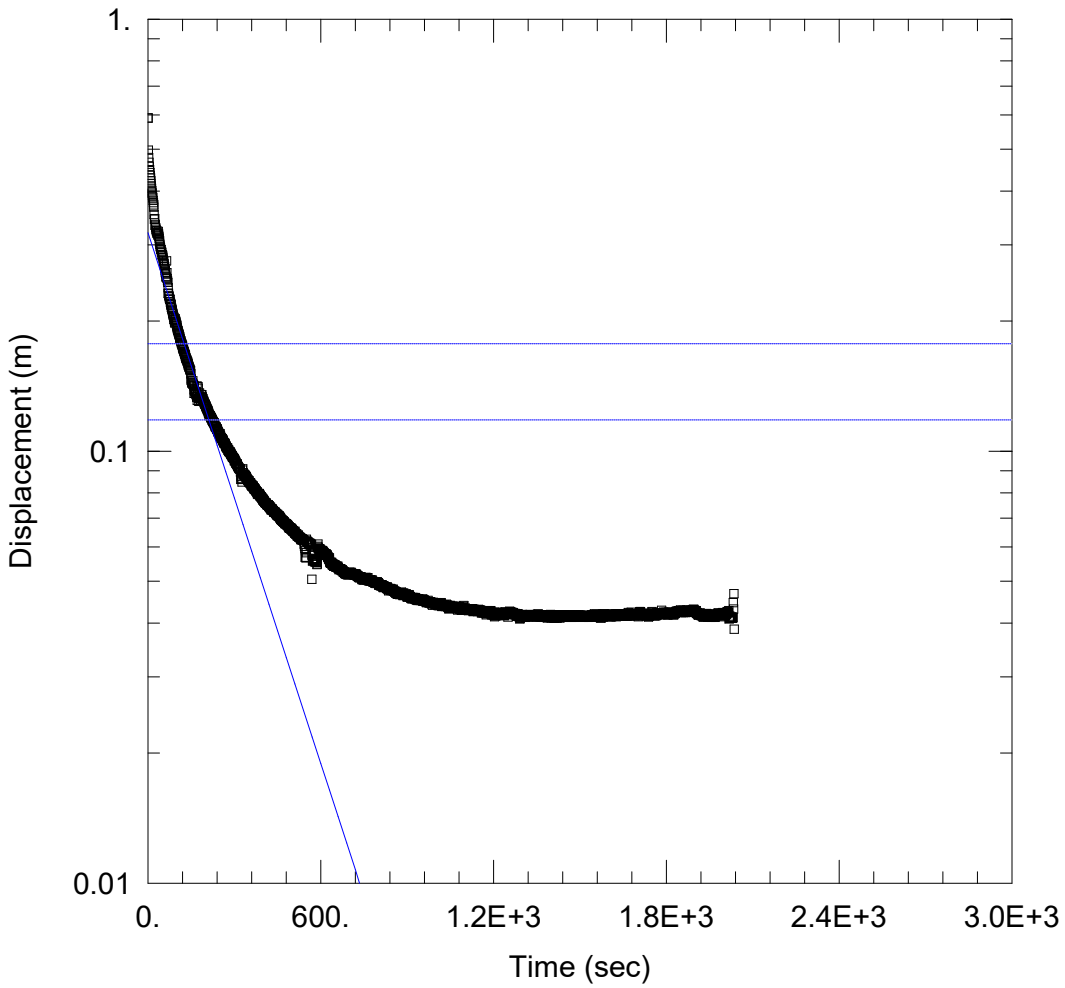
WELL DATA (BH21-5)

Initial Displacement: 0.384 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 1.8 m
Screen Length: 3.05 m
Well Radius: 0.075 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 5.539E-7 m/sec y0 = 0.4368 m



WELL TEST ANALYSIS

Data Set: G:\...\BH21-13.aqt
Date: 10/13/23 Time: 11:19:38

PROJECT INFORMATION

Company: Palmer
Project: 1510436
Location: Picton Airport
Test Well: BH21-13
Test Date: 06-Oct-2023

AQUIFER DATA

Saturated Thickness: 3.01 m Anisotropy Ratio (Kz/Kr): 0.1

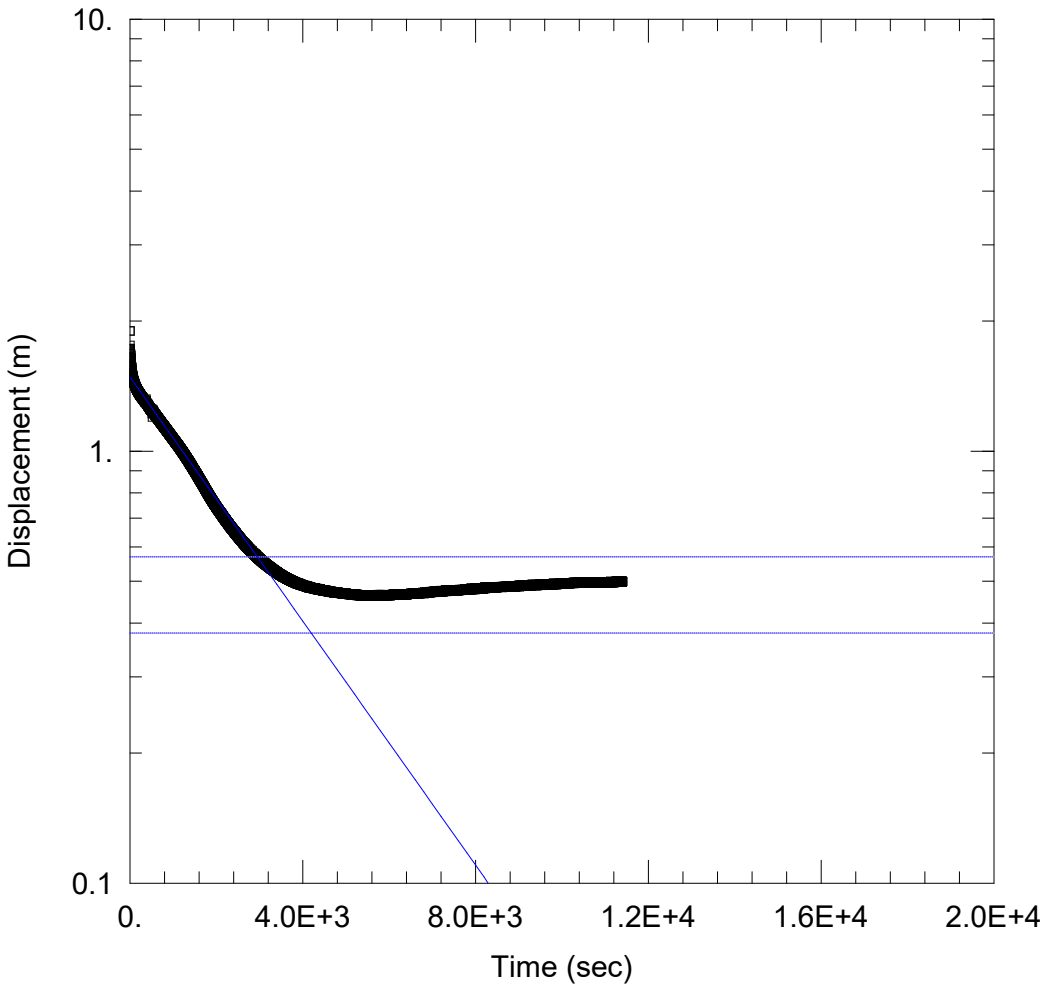
WELL DATA (BH21-13)

Initial Displacement: 0.5903 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 3.01 m
Screen Length: 3.05 m
Well Radius: 0.075 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.426E-6 m/sec y0 = 0.3201 m



WELL TEST ANALYSIS

Data Set: G:\...\BH22-3.aqt
Date: 10/13/23 Time: 11:19:55

PROJECT INFORMATION

Company: Palmer
Project: 1510436
Location: Picton Airport
Test Well: BH23
Test Date: 06-Oct-2023

AQUIFER DATA

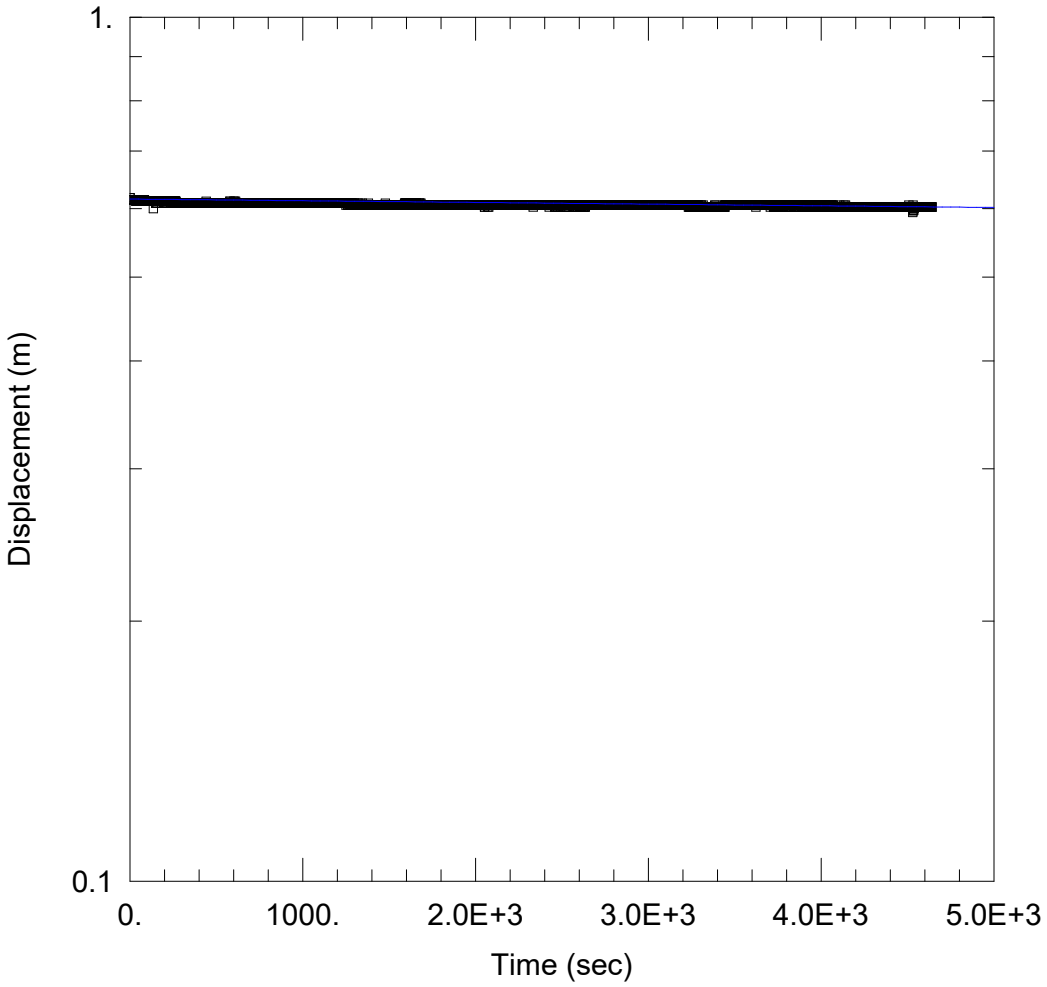
Saturated Thickness: 2.59 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH22-3)

Initial Displacement: 1.897 m
Total Well Penetration Depth: 2.59 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.59 m
Screen Length: 2.5 m
Well Radius: 0.075 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.514E-7 m/sec
y0 = 1.484 m



WELL TEST ANALYSIS

Data Set: G:\...\BH22-4.aqt
Date: 10/13/23 Time: 11:20:12

PROJECT INFORMATION

Company: Palmer
Project: 1510436
Location: Picton Airport
Test Well: BH22-4
Test Date: 06-Oct-2023

AQUIFER DATA

Saturated Thickness: 2.8 m Anisotropy Ratio (Kz/Kr): 0.1

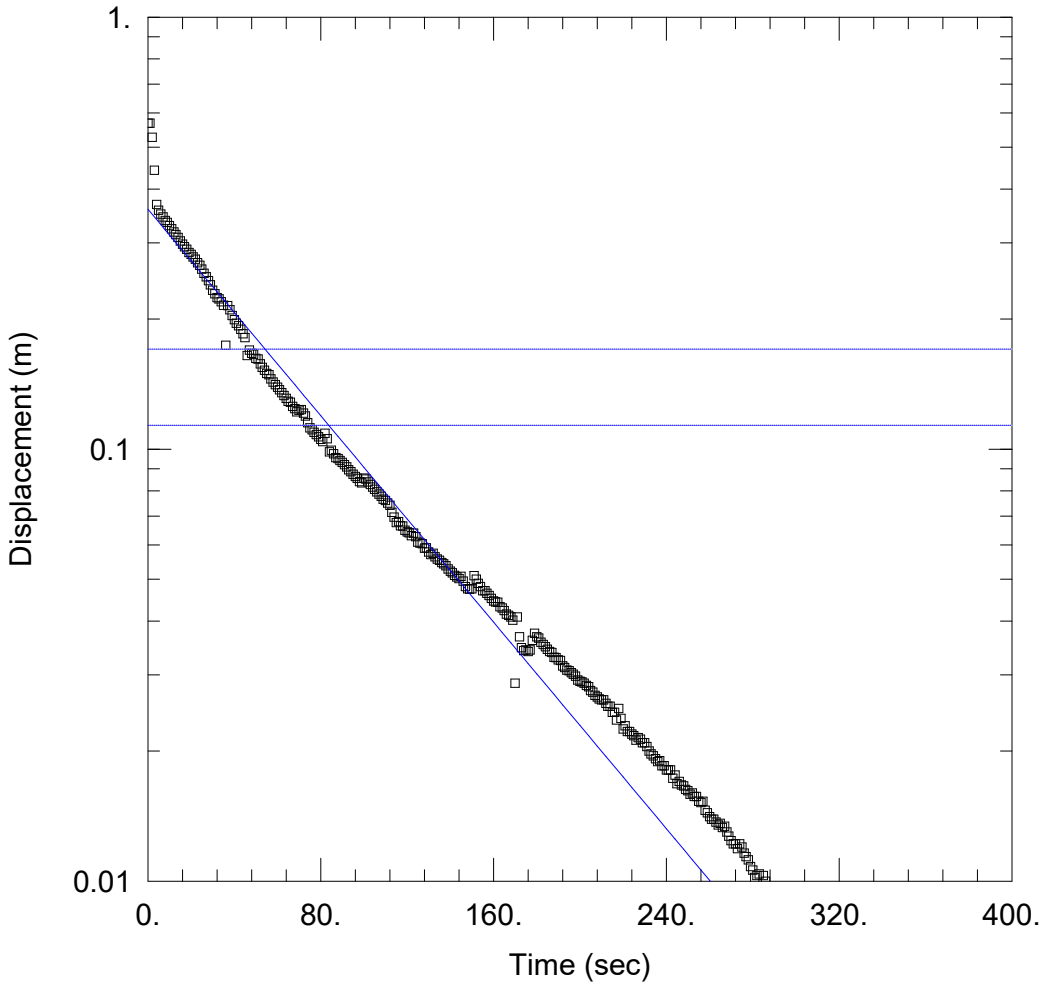
WELL DATA (BH22-4)

Initial Displacement: 0.618 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.8 m
Screen Length: 3.05 m
Well Radius: 0.075 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.454E-9 m/sec y0 = 0.6158 m



WELL TEST ANALYSIS

Data Set: G:\...\BH22-9.aqt
Date: 10/13/23 Time: 11:20:28

PROJECT INFORMATION

Company: Palmer
Project: 1510436
Location: Picton Airport
Test Well: BH22-9
Test Date: 06-Oct-2023

AQUIFER DATA

Saturated Thickness: 2.52 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH22-9)

Initial Displacement: 0.5677 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.52 m
Screen Length: 3.05 m
Well Radius: 0.075 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 4.907E-6 m/sec y0 = 0.3591 m