May 3, 2021
Our File: 219112-1

Via Email: mdewan@exquisitedevelopers.ca

Exquisite Developers Inc.
13182 Britannia Road West
Milton, ON L9E 0V5

Attention: Mr. Muzammil Dewan

Re: Geotechnical Investigation
Proposed Telfer Creek Square Development
2275 – 16th Street East, Owen Sound

Dear Mr. Dewan,

As requested, GM BluePlan Engineering Limited (GMBP) completed the geotechnical investigation for the above development and is pleased to provide you with the attached report.

The soils encountered across the site are generally sandy silt and clayey silt till and are suitable for the design of spread footings at conventional depths as noted in the report.

I trust that the report is satisfactory for your design of the facilities, however should you have any questions or require additional input, do not hesitate to contact me.

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED
Per:

Wm. E. Dubeau, P.Eng.
WED/kd

cc: GMBP: Ian Eriksen – ian.eriksen@gmblueplan.ca
File No.: 219112-1

Prepared By:

BluePlan ENGINEERING

Geotechnical Investigation

Telfer Creek Square - 2275 16th Street East
Owen Sound, ON

GMBP File: 219112-1

April 2021

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
1260-2ND AVE. E., UNIT 1, OWEN SOUND ON N4K 2J3 P: 519-376-1805
WWW.GMBLUEPLAN.CA

TABLE OF CONTENTS

1. INTRODUCTION 1
2. BACKGROUND 1
2.1 Site Location and Features 1
2.2 Geology and Physiography 2
2.3 Soil Standards – Regulatory Setting 2
3. SUBSURFACE INVESTIGATION 3
3.1 Field Work 3
3.2 Subsurface Conditions 4
3.2.1 Topsoil and Organics 4
3.2.2 Clayey Silt 4
3.2.3 Sandy Silt 4
3.2.4 Clayey Silt Till 4
3.3 Groundwater Conditions 4
3.4 Initial Environmental Sampling 5
4. DISCUSSION AND RECOMMENDATIONS 5
4.1 Foundation Loading 5
4.1.1 Residential Buildings 5
4.1.2 Commercial Buildings 6
4.1.3 Summary of Bearing Capacities 6
4.2 Slab-on-Grade Construction 7
4.3 Seismic Site Classification 7
4.4 Lateral Earth Pressures 8
4.5 Excavating and Dewatering 8
4.6 Pipe Bedding 8
4.7 Backfilling 9
4.8 Roadway and Parking Lot Construction 9
4.9 Environment Results and Initial Findings 10
5. STATEMENT OF LIMITATIONS 10

FIGURES

FIGURE 1: SITE LOCATION PLAN
FIGURE 2: BOREHOLE LOCATION PLAN

TABLES

TABLE 1: SOIL SAMPLES – ANALYTICAL RESULTS

APPENDICES

FIGURES:
TABLES:
APPENDIX A: BOREHOLE AND TESTHOLE LOGS
APPENDIX B: GRAIN-SIZE ANALYSIS
APPENDIX C: ANALYTICAL & CERTIFICATE OF LABORATORY ANALYSIS – ENVIRONMENTAL SOIL DATA

TELFER CREEK SQUARE - 2275 16TH STREET EAST

OWEN SOUND, ON

GEOTECHNICAL INVESTIGATION

APRIL 2021

GMBP FILE: 219112-1

1. INTRODUCTION

Exquisite Real Estate Holdings Inc. is proposing to develop the property located at 2275 16th Street East within the City of Owen Sound. Exquisite Real Estate Holdings Inc. has requested that GM BluePlan Engineering Ltd. (GMBP) provide geotechnical services to support the design work for the proposed development.

A proposal for the geotechnical services was prepared and submitted by GMBP on April 14, 2020 and upon receiving authorization to proceed, the drilling of boreholes was carried out on February 25, 26 and March 8, 2021.

The proposed development will consist of residential and commercial spaces. The northern portion of the lot is to be developed as commercial spaces and a central parking lot. The southern portion of the lot is proposed to consist of two residential multi-unit buildings based on the most recent conceptual site plan supplied to GMBP, dated June 23, 2020. GMBP is also providing Exquisite Developers Inc. with stormwater and civil engineering services and working with the Architect – G.M. Diemert Architects Inc.

A review of background information and the information collected during the site investigations is presented herein as well as recommendations for the design of the structural foundations, asphalt parking lot, stormwater and civil features for the proposed site.

2. BACKGROUND

2.1 Site Location and Features

The site is located on the east side of Owen Sound, along 16th Street East, Highway 26 connecting link (Figure 1). The site is 17.4 acres in size and is a trapezoidal shape. The current site conditions consist of a residential dwelling and agricultural accessory buildings occupying the northwest corner of the property. The rest of the site is mainly treed, and surface flows are generally directed southeast towards the unnamed tributary of Bothwell's Creek that bisects the property in a northeast direction. The former Canadian Pacific Railway runs along the southeast boundary of the site. The railway line property now serves as a multi-use trail. The City of Owen Sound expanded their sanitary sewer and watermain through the rail trail corridor to support further development in the area.

Preliminary site plans for the development identify a central parking lot, with commercial buildings on the east and west borders of the lot. The southern portion is the residential portion of the development with a roundabout and two separate multi-unit residential buildings. Access to the site will be from a shared entrance with the commercial development owner to the east.

2.2 Geology and Physiography

The "Physiography of Southern Ontario", Chapman and Putnam, 1985, identifies the project area as being part of the "Shale Plains" of the Cape Rich Steps, along a former beach ridge, with a few drumlins. The Shale Plains are described as having minimal overburden underlain by grey-brown dolostone bedrock of the Lower Silurian-Fossil Hill formation. The Quaternary Geology of Canada Mapping (Map 2556) indicates that the soil within the area consists predominantly of moderately stony, calcareous clayey silt till. Based on the "Soils of Grey County", Soil Survey Report No. 17, local area soils are Vincent series; described as fine textured limestone till comprised of stony silty clay loam with good drainage.

Review of local Ministry of Environment, Conservation and Parks Well Records was completed to get a general idea overburden soils and depth to bedrock in the area. Based on that review, the overburden soils are generally described as 0.3m to 5.4 m of clay and silt till with gravel and boulders. The till was reported to be underlain by layers of grey limestone, blue shale and red shale. Based on the well records, the bedrock in the study area is generally consistent, with an approximate elevation of 210.00m. These referenced bedrock elevations are additionally supported as the Grey Bruce Groundwater Management Study identifies a bedrock elevation of about 220.00m.

2.3 Soil Standards – Regulatory Setting

In order to determine the applicable soil standard criteria for the site, five characteristics of the site need to be determined.

Property Usage

The past usage of the property has a been for agricultural activities. The proposed development includes for commercial and residential usage.

Drinking Water Source

The drinking water source in Owen Sound is supplied from the Georgian Bay, from the City of Owen Sound Water Treatment Plant located approximately 2.5 km Northwest of the subject site. The site and surrounding properties are supplied drinking water from the municipal water system; therefore, the non-potable groundwater condition is selected.

Soil Grain Size Distribution

As part of the determination of the applicable criteria, the soil texture must be defined as either "fine and medium textured" or "coarse textured" based on site conditions. Coarse textured soils contain more than 50 percent by mass of particles greater than or equal to 75 µm in diameter. Based on the soils observed during the subsurface investigations at the site (organics, sand, silt and clay), the fine and medium textured soil criteria have been conservatively selected as the applicable regulatory criteria.

Depth of Overburden

In determining the applicable regulatory criteria, the depth of soil (overburden) must also be taken into consideration. Sites containing less than 2 m of overburden over 1/3 of the property or more are defined by O. Reg. 153/04 (as amended) as "shallow soil properties" and as a result, have a separate set of analytical criteria.

The depth of soil at the subject property is estimated to be in the range of 10m to 15m metres throughout the site, and therefore, the site is not considered a shallow soil property.

Proximity to a Water Body

Where all or part of the subject property lies within 30 m of a surface water body, separate criteria were derived with the objective of protecting surface water bodies. The un-named tributary of Bothwell's creek is defined as a surface water body under the regulations.

In consideration of the site-specific conditions noted above, the generic site condition standards for use within 30 m of a water body in a non-potable ground water condition for an Industrial/Commercial/Community property use with fine and medium textured soils has been selected as the Standard for the site. Therefore, a comparison of the analytical findings to the Table 9 criteria of the Standard is provided in the attached tables.

3. SUBSURFACE INVESTIGATION

3.1 Field Work

The field work occurred under the direction of GMBP staff over three days and consisted of drilling of fifteen (15) boreholes across the site as the locations identified on the Borehole Location Plan (Figure No. 2). The boreholes were advanced by London Soil Test Ltd. The locations of these boreholes can be also be viewed on Figure No. 2. The locations of the boreholes were determined to obtain spatial representation across the developed portion of the site. The deeper boreholes were placed in proximity of the multi-level buildings and the shallow holes to gain coverage of the lot features.

The boreholes were advanced using a Diedrich D-120 Track mounted drill rig and 0.14m ø (5 ½" ø) solid stem augers. Samples were collected using a 0.05m ø (2" ø) split spoon sampler 0.6m (24") in length.

BH-2, and BH-5 were drilled to a depth of 25 ft. (7.5 m). BH-1, BH-3, BH-4, BH-6, BH-7, BH-8, and BH-14 were drilled to a depth of 20 ft. (6.5 m). BH-10, BH-11, BH-13, BH-14 and BH-15 were drilled to a depth of 15 ft. (4.5m). All depths are in reference to the ground surface elevation.

Since shallow foundations are anticipated and the water levels were estimated to be no more that 3 m below grade, three (3) shallow temporary piezometers were installed to monitor the shallow groundwater levels. The piezometers were installed at the locations of BH-2, BH-5 and BH-14.

Standard penetration tests (SPT) were conducted typically at 0.75m intervals down to approximately 3.8 mbgs and was then opened to 1.5 m intervals with the soil samples recovered from the split spoons. The blow counts (N-Values) per foot were observed and the soil stratigraphy and groundwater conditions were logged and recorded and are presented in the Borehole Logs in Appendix 'A'. The recorded blow counts for each soil strata were reviewed and utilized to infer compactness conditions and consistency of the soil encountered. The soil samples were collected and stored in separate containers and were transported to the GMBP laboratory in our Owen Sound office for further classification, testing and storage.

3.2 Subsurface Conditions

3.2.1 Topsoil and Organics

A surficial layer of black topsoil and organic material was encountered across the site. The layer was found to be 200 mm to 400 mm in thickness with an average thickness of 285 mm for the boreholes advanced.

3.2.2 Clayey Silt

Generally, at all the borehole locations, a clayey silt with varying amounts of sand and gravel was found underlying the topsoil and organics layer. The clayey silt deposits are approximately 1.2 m to 2.8 m in thickness. The N values within the clayey silt layers were observed to be 4 to 15 blows, which correlates to a firm to stiff consistency. The clayey silt was found to be in a moist condition, with moisture contents ranging from 24% for the upper deposits to 12% at lower depths. The recent snow melt likely increased the observed moisture in the upper layer.

Grain-size analysis for a sample obtained from BH-3 at 0.76 to 1.37 mbgs yielded a particle size distribution of 15% Gravel, 31.6% Sand, 32.6% Silt and 20.8% Clay. The estimated coefficient of permeability is 9×10^{-10} cm/sec.

3.2.3 Sandy Silt

Beneath the silty clay soils was a sandy silt with a little clay and a little to no gravel. The deposits of sandy silt were found to be 3.30 m to 0.7 m in thickness. The density of the sandy silt was found to be loose to compact, based on observed blow counts of 4 to 26. The laboratory moisture contents of the sand were determined to range 8% to 16%, indicating a moist to wet state.

Grain-size analysis for a sample obtained from BH-6 at 2.29 to 2.90 mbgs yielded a particle size distribution of 8.3% Gravel, 31.1% Sand, 46.7% Silt and 13.9% Clay. The estimated coefficient of permeability is 3.6×10^{-7} cm/sec.

3.2.4 Clayey Silt Till

The boreholes that were advanced across the site all were terminated in a clayey silt till with a brown to grey colour. The till featured some sand and gravel within the soil matrix. The till was dry, with some increased moisture at the interface with the upper soils. Laboratory determined moisture contents ranged from 6% to 14%. The inferred consistency of the soil was very stiff in the sections to hard with depth with observed blow counts ranging from 23 to refusal on 50 blows for 3" to 4" penetration of the soil.

3.3 Groundwater Conditions

During drilling, groundwater observations were recorded. Generally, soils across the site were found to be moist to wet with depth in the upper soils above the clayey silt till. The clayey silt till was found to be dry to moist, with only elevated moisture contents resulting from perched groundwater seeping into the borehole cavity during drilling. Temporary piezometers were installed to observe the shallow groundwater conditions across the site.

		March 25, 2021	
Location	Ground Surface Elevation (m)	Measurement (mbgs)	Elevation (m)
BH-2	229.78	1.49	228.29
BH-5	230.47	0.66	229.81
BH-14	233.49	1.37	232.12

The water levels recorded show the perched conditions that exist on the site. These measurements were taken after recent snow melt and some rainfall and are reflective of spring perched groundwater conditions. Observations are recommended in a few months for comparison purposes.

3.4 Initial Environmental Sampling

During the field investigation, selected soils samples were initially screened for potential environmental impacts. This was done visually and through checking the odour to determine if any petroleum hydrocarbons (PHCs) impacted or volatile organic compounds (VOCs) soils were present at the borehole locations. The samples screened were from boreholes in proximity to the northwest corner of the property were the residence, barn and accessory building are located. No PHC of VOC impacts were evident from the samples at the boreholes that were advanced on-site. Further screening of soil samples for metals and inorganic parameters was undertaken by submitting samples to Bureau Veritas Laboratories (BVL) in Mississauga, ON from three borehole locations, BH-10, BH-11 and BH-14, within the area of possible impacts. The Laboratory Certificates of Analysis are provided in Appendix 'C' and the result are summarized in Table 1. The results of the findings are discussed below.

The submission of the soil samples for chemical analysis is considered only as an initial screen and does not constitute a Phase 1 or 2 Environmental Site Assessment.

4. DISCUSSION AND RECOMMENDATIONS

The Telfer Creek Square development plan is yet to be finalized and therefore the discussion and recommendations herein are based on the latest design information (GMDA Proposed Site Plan dated June 23rd, 2020). At this stage of the conceptual design, it is understood that there is to be two residential buildings, three-storeys in height, located along the southeast development boundary and will have a typical perimeter and pier concrete foundation with possible internal foundations at the hallways and shear walls constructed to a minimum depth of 1.2m below grade for frost protection. The upper floors will likely be precast core slabs supported on steel framing and steel columns and concrete piers and pads. The roof system will likely be flat and supported with standard structural steel, open web joists or trusses with pitched roof at the elevator. The foundation for the elevator shaft will likely be the deepest component below grade.

The commercial portion of the development is proposed to consist of drive-through restaurant and a retail storefront along the westside of the development. Currently, on the east side of the development an office space and commercial building is proposed with the possibility of another 3-storey residential development occupying that portion of the development.

4.1 Foundation Loading

4.1.1 Residential Buildings

While the site development plan is yet to be finalized, early conceptual designs suggest that the residential buildings will have a walkout basement that coincides with the existing grade along the southeast boundary of ±230.00m, which would place the first floor elevation near to ±233.00m. Frost protected foundations are to be extended down to suitable inorganic bearing soil. For the Owen Sound area, frost penetrations are 1.4 mbgs. Based on the preliminary information, the underside of the strip footings is expected to be near ±228.50m, with the underside of the column pads set at deeper elevations.

With the footings for the residential buildings near an elevation of ±228.50m, the footings would rest on native clayey silt or sandy silt. The clayey silt was generally encountered in a firm state while the sandy silt was found to be loose to compact. The inferred density state was found to generally increase with depth. At this elevation, the recommended bearing capacities for design purposes are 100 kPa at Serviceability Limit States (SLS) and 140 kPa at Ultimate Limit States.

If increased soil bearing capacities are desired, the footings and foundations wall could be constructed to greater depth reach soils with higher bearing capacities. The underlying clayey silt till in the area of the proposed residential development is near and elevation of ±226.50m. At this elevation an increased bearing capacity for design purposes of 200 kPa at SLS and 280 kPa at ULS.

If any individual column pads utilized as part of the foundation design are too large, consideration can be given to extending the underside of the pad down to the depths discussed above to reach the same 200 kPa at SLS and 280 kPa at ULS. However, the increased excavation depth may not be warranted once the design is finalized.

4.1.2 Commercial Buildings

Based on the latest available site plan, the commercial phase of the development will be located within the northwest portion of the property. Early conceptual grading suggests a finished floor elevation in the range of ±235.00m. Using the same frost penetration information, the underside of footings would be expected to be near ±233.50m. At this elevation, the founding soils are expected to be clayey silt with a little sand and gravel in a firm inferred consistency. The inferred consistency was estimated to increase with depth. At this elevation, the recommended bearing capacities for design purposes are 100 kPa at Serviceability Limit States (SLS) and 140 kPa at Ultimate Limit States.

4.1.3 Summary of Bearing Capacities

In summary, the following table is presented to identify the interpreted depths for the various proposed bearing capacities.

Borehole No.	Ground Surface Elevation (m)	SLS (kPa)	ULS (kPa)	Estimated Highest Founding Elevation (m)	Soil Type
1	229.52	100	140	229.22	Sandy Silt
		200	280	227.23	Clayey Silt Till
2	229.78	100	140	229.58	Sandy Silt
		200	280	227.49	Clayey Silt Till
3	230.40	100	140	230.10	Clayey Silt
		200	280	227.35	Clayey Silt Till
4	229.61	100	140	229.21	Sandy Silt
		200	280	227.32	Clayey Silt
5	230.47	100	140	230.17	Sandy Silt
		200	280	227.42	Clayey Silty Till
6	230.78	100	140	230.48	Clayey Silt
		200	280	227.73	Clayey Silt Till
7	230.07	100	140	229.77	Clayey Silt
		200	280	227.02	Clayey Silt Till

8	231.92	100	140	231.60	Clayey Silt
		200	280	228.87	Clayey Silt Till
9	231.50	100	140	231.20	Clayey Silt
		200	280	226.73	Clayey Silt Till
10	233.79	100	140	233.50	Clayey Silt
		200	280	230.74	Clayey Silt Till
11	234.51	100	140	233.58	Clayey Silt
		200	280	231.49	Clayey Silt Till
12	233.40	100	140	233.53	Clayey Silt
		200	280	230.73	Clayey Silt Till
13	231.52	100	140	231.28	Clayey Silt
		200	280	226.96	Clayey Silt Till
14	233.49	100	140	233.19	Sandy Silt
		200	280	228.67	Clayey Silt Till
15	232.22	100	140	231.90	Clayey Silt
		200	280	229.17	Clayey Silt Till

4.2 Slab-on-Grade Construction

Where conventional slab-on-grade elements are proposed, all topsoil must be removed down to the underlying subgrade soils. The existing silty clay can remain in place, however inspection and proof rolling with compaction equipment will be required to confirm suitability. The backfilled areas are to be compacted to 98% of the material's Standard Proctor Maximum Dry Density (SPMDD). Due to the moisture sensitivity and difficulty to achieve compaction, the harvested clayey or silty soils are not recommended to be utilized as backfill inside the building or other settlement sensitive areas, such as sidewalks, exterior slabs and parking lots.

Where additional backfill is required to raise the grade inside the buildings, a Granular "B" meeting OPSS 1010 specifications is recommended to be utilized up to the final 150mm lift where Granular "A" is recommended to be placed under the concrete slab or insulation.

Where moisture sensitive flooring is proposed, consideration must be given to incorporating moisture vapour barriers such as membrane below the slab and specialty primers and adhesives as part of the flooring system.

4.3 Seismic Site Classification

As per 4.1.8.4 of the Ontario Building Code (OBC), site classification for ground shall conform to Table 4.1.8.4A.

From historical soils information and from well records for the area, the upper 10m of soils tended to be clay and silt tills with gravel and cobble inclusions over hard till. The bedrock is generally located at the 10 to 15m depth, and as a result, the Site Class for the site is interpreted to be "D".

4.4 Lateral Earth Pressures

The following table summarises the estimated soil parameters of the imported granular materials as per OPSS 1010, to be backfilled against any retaining wall constructed and the native soils encountered on-site.

	Soil Types			
Soil Parameters	Granular A	Granular B Type 1	Sandy Silt	Clayey Silt/Till
Internal Friction Angle (ϕ)	34°	33°	30°	28°
Unit Weight (γ)	23 kN/m^3	21 kN/m^3	20 kN/m^3	19 kN/m^3
Cohesion (c)	0 kPa	0 kPa	0 kPa	15 kPa
Coefficient of Active Earth Pressure (K_a)	0.28	0.29	0.33	0.36
Coefficient of Passive Earth Pressure (K_p)	3.54	3.39	3.00	2.77
Coefficient of At-Rest Earth Pressure (K_o)	0.44	0.46	0.50	0.53

The earth pressure coefficients assume that there is no slope behind any potential retaining structures and that the structure forms a right angle with the backfill material.

4.5 Excavating and Dewatering

Due to the proposed walkout basements and the existing grades of the site, the footing and servicing excavations could reach 3 to 4 m in depth in the area of the multi-level residential buildings. The excavations for the commercial building foundations and servicing are expected to be shallower. Where the excavations are in firm undisturbed clayey silt or loose sandy silt and are greater than 1.2m in depth, the excavation slopes are to be graded at 1 horizontal unit to 1 vertical unit from the bottom of the excavation. Where the bottom of the excavation is terminated in the stiff silty clay and clayey silt till, the excavation can near vertical for the bottom 1.2m and then cut back to a 1 to 1 slope. Where servicing trenches are deeper and insufficient room is available for appropriate sloping, trench boxes or shoring may be necessary.

The soils to be excavated on-site can be classified at follows in accordance with the Ontario Health and Safety Act and Construction Projects.

Very Stiff to Hard Clayey Silt Till ..... Type 2
Firm to Stiff Clayey Silt and Loose to Compact Sandy Silt.....Type 3

Perched groundwater conditions are expected to impact foundation construction if undertaken in the "wetter" spring and fall months. Conventional temporary dewatering with pumps and temporary sumps located at an excavated low point should be sufficient to control groundwater seepage if encountered during construction.

4.6 Pipe Bedding

It is expected that the service trenches will typically be terminated in the native undisturbed firm clayey silt soil where bearing issues are not a concern. It is recommended that the standard granular bedding in accordance with OPSS Specifications be utilized.

The minimum thickness of bedding material below the bottom of the pipe should be 150mm and consist of Granular "A", compacted to at least 95% SPMDD. For flexible pipes, the cover material should consist of Granular "A" compacted to 95% of the material's SPMDD

4.7 Backfilling

Above the Granular 'A' covering the pipe, the trenches should be backfilled using inorganic soils placed in maximum uncompacted lift thicknesses of 300mm. This inorganic backfill is to be compacted to a minimum of 95% of the material's Standard Proctor Maximum Dry Density (SPMDD).

The silt and clay predominant soils can be utilized for trench backfill and subgrade fill, provided that the moisture content is generally within 2 to 3% of the optimum and sufficient compaction effort is applied to achieve the minimum required of 95% SPMDD for subgrade construction.

The reuse of the inorganic clay and silt is dependent on construction activities taken place during relatively dry weather. Depending on the final cut/fill volumes for the site, the more suitable backfill materials should be directed to the trenches in the roadways and where long-term performance is more important and utilize the balance of on-site materials for general grading where possible. The contract should contain provisions to import select subgrade backfill or additional granular materials.

Where imported granular materials are utilized in trench backfill, review of the use of frost tapers is recommended to minimize the impacts from frost heave.

Unsuitable materials, such as fill with organics, organic soils, and frozen soils are not to be utilized for backfilling or subgrade construction.

4.8 Roadway and Parking Lot Construction

Based on the proposed pavement usage, and the type and strength of the subgrade soils, the following pavement structure outlined in Table 2 is recommended for the internal roadways and parking lot.

Pavement Component	Parking Areas (mm)	Access Route and Turn-Around (mm)	Specified Compaction (%)
HL-3 Surface Course	40	50	92% - 96.5% MRD
HL-4 Binder Course	50	50	92% – 96.5% MRD
OPSS Granular "A"	150	150	100% SPMDD
OPSS Granular "B"	300	450	100% SPMDD

The Granular "A" and "B" are to meet OPSS Form 1010 specifications and be compacted as noted above.

The above recommendations are based on construction being carried out during a drier time of the year and the subgrade being well compacted and stable.

It is recommended that the subgrade stability be determined with a "proof-roll" to determine any soft spots. If any soft spots encountered in the subgrade during the construction and prior to finish grading should be removed and replaced with suitable Granular "B" and compacted to 98% SPMDD.

In addition, due to the elevated silt and clay content of the native subgrade soils, it is recommended that perforated subdrains be installed along the curb line and sidewalks with outlets to the storm sewer to promote drainage of the granular subbase. The 150mm perforated subdrain is to be bedded in 19mm Ø clear stone which is to be wrapped with a geotextile and installed as per OPSD 216.021 or the specified detail. Positive grading of the subgrade is also critical towards the installed subdrains.

4.9 Environment Results and Initial Findings

As discussed in previous sections, soil samples were screened in the field for any visible or odour evidence of impacted soils. Further screening for metals and inorganics was performed in the laboratory to provide initial data for possible soil management. Based on the regulatory setting, the three samples from BH-10, BH-11 and BH-14 were compared to Table 1 and Table 9 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (July 2011). Based on the analytical findings, the soils samples collected from the identified locations meet the guidelines of Table 1 and Table 9 for the tested parameters.

It must be noted that the submission of the soil samples for chemical analysis is considered only as an initial screen and does not constitute a Phase 1 or 2 Environmental Site Assessment.

5. STATEMENT OF LIMITATIONS

The discussion and recommendations in this report are based upon information gathered at the borehole locations and available geological and physiographical information of general nature for the area. Sub-surface and groundwater conditions are variable and will differ in area beyond the investigated boreholes. As a result, conditions may become apparent during further investigation or construction, which would not be detected or anticipated at the time the site investigation was performed and when this report was prepared.

The information in this report is intended for the sole use of Exquisite Real Estate Holdings Ltd. and its agents. GM BluePlan Engineering Limited accepts no liability for use of this information by third parties based on information provided in this report.

The final shape and location of the proposed development at the site have not been confirmed and therefore comments made within this report are made in general only to assist the owner and designers for the project in question. Furthermore, the number of boreholes may not be sufficient to determine all the factors that may affect the construction methods and costs. For this reason, Contractors bidding on this project or undertaking the construction should make their own interpretation of the factual information presented within this report and then draw their own conclusion on the sub-surface conditions and how it will affect the methods and cost of construction.

We recommend that we be retained to ensure that all the necessary stripping, sub-grade preparation, and compaction requirements are met, and to be available to confirm that the soil conditions do not deviate from those presented within this report

All of which is respectfully submitted,

GM BLUEPLAN ENGINEERING LIMITED

Per:

Ethan Webb, E.I.T.

Reviewed by:

Wm. E. Dubeau, P.Eng.

FIGURES:

219112-1
2275 16th Street East
City of Owen Sound

NOT TO SCALE
MARCH 2021

SITE LOCATION PLAN

TELFER CREEK SQUARE
EXQUISITE REAL ESTATE
HOLDINGS LTD.

Figure No. 1

BluePlan ENGINEERING

16th STREET EAST

HIGHWAY No. 26

BH-11
ELEV. 234.51

BH-10
ELEV. 233.79

BH-8
ELEV. 231.92

BH-7
ELEV. 230.07

BH-6
ELEV. 230.78

BH-12
ELEV. 233.40

BH-9
ELEV. 231.50

BH-13
ELEV. 231.52

BH-14
ELEV. 233.49
PIEZOMETER

BH-5
ELEV. 230.47
PIEZOMETER

BH-15
ELEV. 232.22

BH-4
ELEV. 229.61

BH-3
ELEV. 230.40

BH-2
ELEV. 229.78
PIEZOMETER

BH-1
ELEV. 229.52

GREY COUNTY RAIL TRAIL

219112-1
2275 16th Street East
City of Owen Sound

LEGEND

BH-1
ELEV 215.23 — TESTHOLE NUMBER, LOCATION AND GROUND ELEVATION

30 0 20 40 80
1:2000 (m)

SCALE = 1:2,000
JANUARY 2021

BOREHOLE LOCATION PLAN

TELFER CREEK SQUARE
EXQUISITE REAL ESTATE
HOLDINGS LTD.

Figure No. 2

BluePlan ENGINEERING

GMBP FILE:219112-1 TH Location-K.dwg LAYOUT:Fig 2-Testhole Location
LAST SAVED BY: KBOERS PLOTTED: 3/19/2021 3:03:12 PM

TABLES:

Table 1: Soil Samples - Analytical Results

Sample ID	BH-10	BH-11	BH-14	Guideline 2011 Table 1 Background	Guideline 2011 Table 9 Non-Potable GW within 30m of Water Body
Sample Depth (mbgs)	0.76 - 1.52	0.76 - 1.52	0.76 - 1.52	Agricultural or Other Property Use	Industrial / Commercial/ Community Property Use
Sampling Date	25-Feb-2021			Fine and Medium Grained	Fine and Medium Grained
METALS AND INORGANICS [ug/g]					
Antimony	<0.20	<0.20	<0.20	1	1.3
Arsenic	4.5	5.2	3.5	11	18
Barium	24	31	24	210	220
Beryllium	0.38	0.57	0.4	2.5	2.5
Boron (Hot Water Soluble)	0.13	0.11	0.073	NV	1.5
Cadmium	<0.10	<0.10	<0.10	1	1.2
Chromium	12	16	12	67	70
Chromium VI	<0.18	<0.18	<0.18	0.66	0.66
Cobalt	7.1	9.7	7	19	22
Copper	22	38	26	62	92
Lead	4.6	6.1	4.3	45	120
Mercury	<0.050	<0.050	<0.050	0.16	0.27
Molybdenum	<0.50	<0.50	<0.50	2	2
Nickel	16	21	15	37	82
Selenium	<0.50	<0.50	<0.50	1.2	1.5
Silver	<0.20	<0.20	<0.20	0.5	0.5
Thallium	0.082	0.13	0.11	1	1
Vanadium	15	21	17	86	86
Zinc	29	37	29	290	290
pH (pH Units)	7.86	7.75	7.85	NV	NV
Conductivity (ms/cm)	0.17	0.16	0.16	0.47	0.7
Sodium Adsorption Ratio	0.51	0.26	0.25	1	5
Cyanide, Free	<0.01	<0.01	<0.01	0.051	0.051
Boron (Total)	14	19	14	36	36
Uranium	0.40	0.49	0.42	1.9	2.5

Notes:

1. Criteria are from the Soil, Groundwater, and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.
2. Parameters that are in **bold** exceed the Table 1 (background) criteria of the Standard.
3. Parameters that are shaded exceed the applicable Table 9 (Non-Potable Groundwater) criteria of the Standard for Industrial/Commercial/Community property use.

APPENDIX A:
BOREHOLE LOGS

Log of Borehole: 1

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 26, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value (20 40 60 80) / % Moisture (5 10 15 20)	Ground Water Monitoring Details
0 / 0		Ground Surface	229.52						
0 / 0		Black Topsoil and Organics (300mm Thick).	229.22	1	SS			6	
3 / 1		Brown Clayey Silt with a little Sand and Gravel. Moist and Stiff.		2	SS			13	
6 / 2				3	SS			9	
			227.23						
8 / 3		Brown Sandy Silt with a little Clay and Gravel. Wet and Dense.		4	SS			26	
			226.47						
10 / 3		Brown Grey Clayey Silt Till with some Gravel. Moist and Very Stiff to Hard with Depth.		5	SS			31	
16 / 5				6	SS			>50 4"	
20 / 6				7	SS			>50 4"	
			222.66						
23 / 7		Borehole Terminated							
30 / 9									

Soil Properties: N-Value: 6, 13, 9, 26, 7, 31, 11, >50 4", 7, >50 4"; 22, 17, 12, 16

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 2

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 26, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)
0 / 0		Ground Surface	229.78				
0 – 0.2		Black Topsoil and Organics (200mm Thick).		1	SS		
0.2 – 2.3		Brown Clayey Silt with some Sand and a little Gravel. Moist and Firm to Stiff.		2	SS		
				3	SS		
2.3 / 7			227.49				
2.3 – 3.0		Brown Sandy Silt with a little Clay and Gravel. Moist and Compact.		4	SS		
3.0 / 10			226.73				
3.0 – 8.0		Brown Grey Clayey Silt Till with some Gravel. Dry to Moist and Very Stiff to Hard with Depth.		5	SS		
				6	SS		
				7	SS		
				8	SS		
8.0 / 27			221.40				
8.0 / 28		Borehole Terminated					

Soil Properties: N-Value (20, 40, 60, 80); % Moisture (5, 10, 15, 20)

N-Value profile: 7, 4, 9, 14, 11, 8, 51, 9, >50 5", 12, 45, 8, >50 5", 12, 15, 19

Ground Water Monitoring Details: Native Fill; Bentonite; Sand Pack; 5 ft. Screen

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 3

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 26, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE				Soil Properties N-Value 20 40 60 80 / % Moisture 5 10 15 20	Ground Water Monitoring Details
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)		
0 / 0		Ground Surface	230.40						
0 / 0		Black Topsoil and Organics (300 mm Thick).	230.10	1	SS			6, 4, 4	
3 / 1		Brown Clayey Silt with a little Sand and Gravel. Moist and Soft to Firm.		2	SS			13, 12	
6 / 2				3	SS			11, 22	
9 / 3			227.35	4	SS			9, 36	
10 / 3		Brown Grey Clayey Silt Till with some Gravel. Moist and Very Stiff to Hard with Depth.		5	SS			6, >50 2"	
15 / 4				6	SS			7, >50 3"	
20 / 6				7	SS				
22 / 7			223.54						
23 / 7		Borehole Terminated							
30 / 9									

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 4

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 26, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value (20 40 60 80) / % Moisture (5 10 15 20)	Ground Water Monitoring Details
0 / 0		Ground Surface	229.61						
0–1 / 0		Black Topsoil and Organics (400 mm Thick).	229.21	1	SS			4, 12	
1–3 / 0–1		Brown Sandy Silt with a little Clay and trace Gravel. Moist and Loose.		2	SS			5, 12	
3–7 / 1–2			227.32	3	SS			7, 14	
7–10 / 2–3		Brown Clayey Silt with a little Sand and Gravel. Moist and Very Stiff.	226.56	4	SS			25, 10	
10–22 / 3–6		Brown Grey Clayey Silt Till with some Gravel. Moist and Hard.		5	SS			27, 12	
				6	SS			39, 14	
			222.75	7	SS			30, 13	
22–30 / 6–9		Borehole Terminated							

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 5

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 26, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE				Soil Properties N-Value 20 40 60 80 / % Moisture 5 10 15 20	Ground Water Monitoring Details
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)		
0		Ground Surface	230.47						
0 – 1		Black Topsoil and Organics (300 mm Thick).	230.17	1	SS			11, 10, 15, 4	Native Fill
1 – 3		Brown Clayey Silt with a little Sand and Gravel. Moist and Soft.	228.95	2	SS				
2 – 3		Brown Sandy Silt with a little Clay. Moist and Loose to Compact with Depth.	227.42	3	SS			13, 6, 10, 24	Bentonite
				4	SS				Sand Pack
3 – 5		Brown Grey Clayey Silt Till with some Gravel. Dry to Moist and Hard.		5	SS			8, 49, 6	5 ft. Screen
				6	SS			>50 3", 12	
5 – 8				7	SS			>50 4", 9	
				8	SS				
8		Borehole Terminated	222.09						

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 6

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

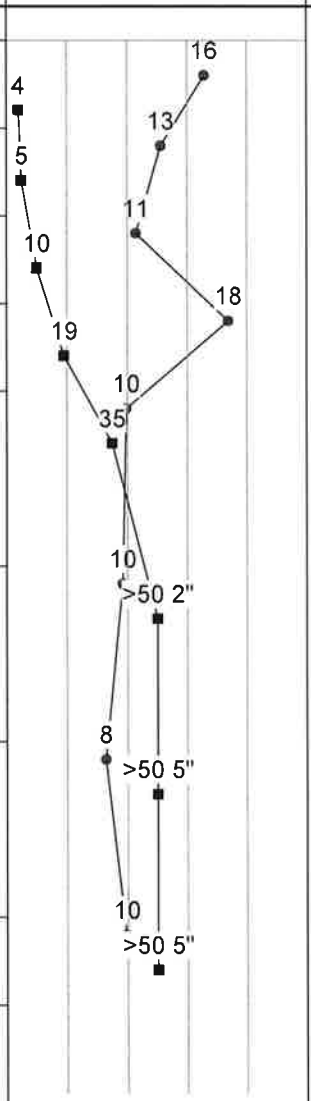
Location: 2275 16th Street East, Owen Sound, ON

Drill Date: March 8, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value (20 40 60 80) / % Moisture (5 10 15 20)	Ground Water Monitoring Details
0 / 0		Ground Surface	230.78						
0 / 0		Black Topsoil and Organics (300 mm Thick).	230.48	1	SS			4	
3 / 1		Brown Clayey Silt with a little Sand and Gravel. Moist and Firm to Stiff.		2	SS			5	
6 / 2				3	SS			10	
7			228.49						
8		Brown Sandy Silt with a little Clay. Wet and Compact.		4	SS			19	
10 / 3			227.73						
11		Brown Grey Clayey Silt Till with some Gravel. Dry to Moist and Hard.		5	SS			35	
15 / 4				6	SS			>50 2"	
20 / 6				7	SS			>50 5"	
25 / 7				8	SS			>50 5"	
27 / 8			222.40						
28 / 9		Borehole Terminated							



Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 7

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: March 8, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value (20 40 60 80) / % Moisture (5 10 15 20)	Ground Water Monitoring Details
0 / 0		Ground Surface	230.07						
0 – 1 / 0		Black Topsoil and Organics (300 mm Thick).	229.77	1	SS			6	
1 – 2 / 0 – 1		Brown Clayey Silt with a little Sand and Gravel. Moist and Firm.		2	SS			6, 13	
3 – 7 / 1 – 2				3	SS			6, 16	
7 / 2			227.78						
8 – 10 / 2 – 3		Brown Sandy Silt with a little Clay. Moist and Loose.	227.02	4	SS			8, 14	
10 – 22 / 3 – 6		Brown Grey Clayey Silt Till with some Gravel. Dry to Moist and Hard.		5	SS			4, 25	
				6	SS			10, >50 5"	
				7	SS			8, >50 5"	
22 / 6			223.21						
23 – 30 / 7 – 9		Borehole Terminated							

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 8

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: March 8, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value (20 40 60 80) / % Moisture (5 10 15 20)	Ground Water Monitoring Details
0 / 0		Ground Surface	231.92						
0 / 0		Black Topsoil and Organics (300 mm Thick).	231.62	1	SS			6	
3 / 1		Brown Clayey Silt with a little Sand and Gravel. Moist and Soft to Firm with depth.		2	SS			4	
6 / 2				3	SS			7	
9 / 3			228.87	4	SS			9	
10 / 3		Brown Grey Clayey Silt Till with some Gravel. Dry to Moist and Very Stiff to Hard with Depth.		5	SS			21	
15 / 4				6	SS			>50 4"	
20 / 6				7	SS			>50 3"	
22 / 6			225.06						
23 / 7		Borehole Terminated							
30 / 9									

Soil Properties: N-Value: 6, 4, 7, 9, 21, 11, >50 4", 10, >50 3"; 18, 13, 12, 12, 7

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 9

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 25, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value (20 40 60 80) / % Moisture (5 10 15 20)	Ground Water Monitoring Details
0 / 0		Ground Surface	231.50						
0–2 / 0		Black Topsoil and Organics (300 mm Thick).	231.20	1	SS			5	
3–5 / 1		Brown Clayey Silt with a little Sand and Gravel. Moist and Soft.	229.98	2	SS			5	
6–15 / 2–4		Brown Sandy Silt with a little Clay. Moist and Loose to Compact with Depth.	226.73	3	SS			6	
				4	SS			9	
				5	SS			22	
				6	SS			8	
16–18 / 5		Brown Grey Clayey Silt Till with some Gravel. Dry to and Hard.	226.17					45	
		Borehole Terminated						11	
								13	
								12	
								14	
								20	
19–30 / 6–9									

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 10

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 25, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value 20 40 60 80 / % Moisture 5 10 15 20	Ground Water Monitoring Details
0 / 0		Ground Surface	233.79						
0 / 0		Black Topsoil and Organics (270 mm Thick).	233.52	1	SS			12	
3 / 1		Brown Clayey Silt with a little Sand and Gravel. Moist and Firm to Stiff.		2	SS			15	
6 / 2				3	SS			7	
9 / 3			230.74	4	SS			16	
10 / 3		Brown Grey Clayey Silt Till with some Gravel. Dry to and Hard.		5	SS			23	
16 / 5			228.46	6	SS			> 50 3"	
17 / 5		Borehole Terminated							

Soil Properties: N-Value: 14, 9, 12, 12, 8

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 11

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 26, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value (20 40 60 80) / % Moisture (5 10 15 20)	Ground Water Monitoring Details
0 / 0		Ground Surface	233.78						
0–3 / 0–1		Black Topsoil and Organics (200 mm Thick).		1	SS			5, 13	
3–5 / 1		Brown Clayey Silt with a little Sand and Gravel. Moist and Soft.	232.26	2	SS			21, 12	
5–7 / 1–2		Brown Sandy Silt with a little Clay. Moist and Compact.	231.49	3	SS			36, 13	
7–10 / 2–3		Brown Clayey Silt Till with some Gravel. Dry and Hard.	230.73	4	SS			11, > 50 3"	
10–17 / 3–5		Brown Grey Clayey Silt Till with some Gravel. Dry and Hard.		5	SS				
17 / 5		Auger Refusal on Suspected Boulder	228.45	6	SS			8, > 50 3"	
		Borehole Terminated							

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 12

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: March 8, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE				Soil Properties N-Value 20 40 60 80 / % Moisture 5 10 15 20	Ground Water Monitoring Details
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)		
0 / 0		Ground Surface	233.78						
0 / 0		Black Topsoil and Organics (250 mm Thick).	233.53	1	SS			3	
1 / 0		Brown Clayey Silt with a little Sand and Gravel. Moist and Firm.		2	SS			7	
2 / 1				3	SS			7	
3 / 1				4	SS			12	
3 / 1			230.73						
3 / 1		Brown Grey Clayey Silt Till with some Gravel. Dry and Hard.		5	SS			9	
4 / 1								40	
5 / 2				6	SS			6	
5 / 2			228.45					35	
5 / 2		Borehole Terminated							
6 / 2								12	
6 / 2								12	
7 / 2								14	
8 / 3								22	
9 / 3									

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 13

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 25, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value (20 40 60 80) / % Moisture (5 10 15 20)	Ground Water Monitoring Details
0 / 0		Ground Surface	231.53						
0 / 0		Black Topsoil and Organics (250 mm Thick).	231.28	1	SS			5	
1 / 0		Brown Clayey Silt with a little Sand and Gravel. Moist to Wet and Firm.		2	SS			6	
2 / 1				3	SS			8	
3 / 1			229.24						
3 / 1		Brown Sandy Silt. Moist and Loose to Compact with Depth.		4	SS			6	
4 / 2				5	SS			14	
5 / 2			226.96					27	
5 / 2		Brown Grey Clayey Silt Till with some Gravel. Dry and Very Stiff.	226.20	6	SS			10	
6 / 2		Borehole Terminated						9	
6 / 2								13	
7 / 2								16	
8 / 3								13	
9 / 3								24	

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 14

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 25, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

SUBSURFACE PROFILE				SAMPLE					
Depth (ft / m)	Symbol	Description	Elevation (m)	Number	Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value (20 40 60 80) / % Moisture (5 10 15 20)	Ground Water Monitoring Details
0 / 0		Ground Surface	233.49						
0 – 1 / 0 – 0.3		Black Topsoil and Organics (300 mm Thick).	233.19	1	SS			7, 8, 8	
1 – 5 / 0.3 – 1.5		Brown Clayey Silt with a little Sand and Gravel. Moist to Wet and Firm.	231.97	2	SS			16, 13, 15	
5 – 15 / 1.5 – 4.6		Brown Sandy Silt with a little Clay. Moist and Loose to Compact with Depth. Clayey Silt Vanes Encountered	228.67	3	SS			8, 22, 33	
				4	SS			13, 15	
				5	SS			11, 37	
15 – 22 / 4.6 – 6.7		Brown Grey Clayey Silt Till with some Gravel. Dry and Very Stiff.	226.63	6	SS			10, 48	
				7	SS				
22 / 6.7		Borehole Terminated							

Ground Water Monitoring Details: Native Fill; Bentonite; Sand Pack; 5 ft. Screen

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

Log of Borehole: 15

Project No: 219112-1

Project: Telfer Creek Square - Geotechnical Investigation

Client: Exquisite Real Estate Holdings Ltd.

Location: 2275 16th Street East, Owen Sound, ON

Drill Date: February 25, 2021

Field Eng/Tech: E. Webb

Drilling Company: London Soil Test Ltd.

Depth (ft / m)	Symbol	Description	Elevation (m)	Sample Number	Sample Type	Recovery (%)	Unit Weight (KN/m3)	Soil Properties: N-Value / % Moisture	Ground Water Monitoring Details
0 / 0		Ground Surface	232.22						
0 – 2 / 0 – 0.6		Black Topsoil and Organics (300 mm Thick).	231.92	1	SS			N-Value: 4	
2 – 10 / 0.6 – 3		Brown Clayey Silt with a little Sand and Gravel. Moist to Wet and Firm.	229.17	2 3 4	SS SS SS			N-Value: 10, 6, 6	
10 – 17 / 3 – 5.2		Brown Grey Clayey Silt Till with some Gravel. Dry and Very Stiff.	226.89	5 6	SS SS			N-Value: 18, 6, 25	
17 / 5.2		Borehole Terminated						N-Value: 9, 14, 15, 14, 17	

Soil Properties: N-Value (20, 40, 60, 80); % Moisture (5, 10, 15, 20)

Drill Method: Solid Stem Auger

Notes:

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA.
1260 Second Avenue E., Unit 1. Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

APPENDIX B:
GRAIN-SIZE ANALYSIS

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA

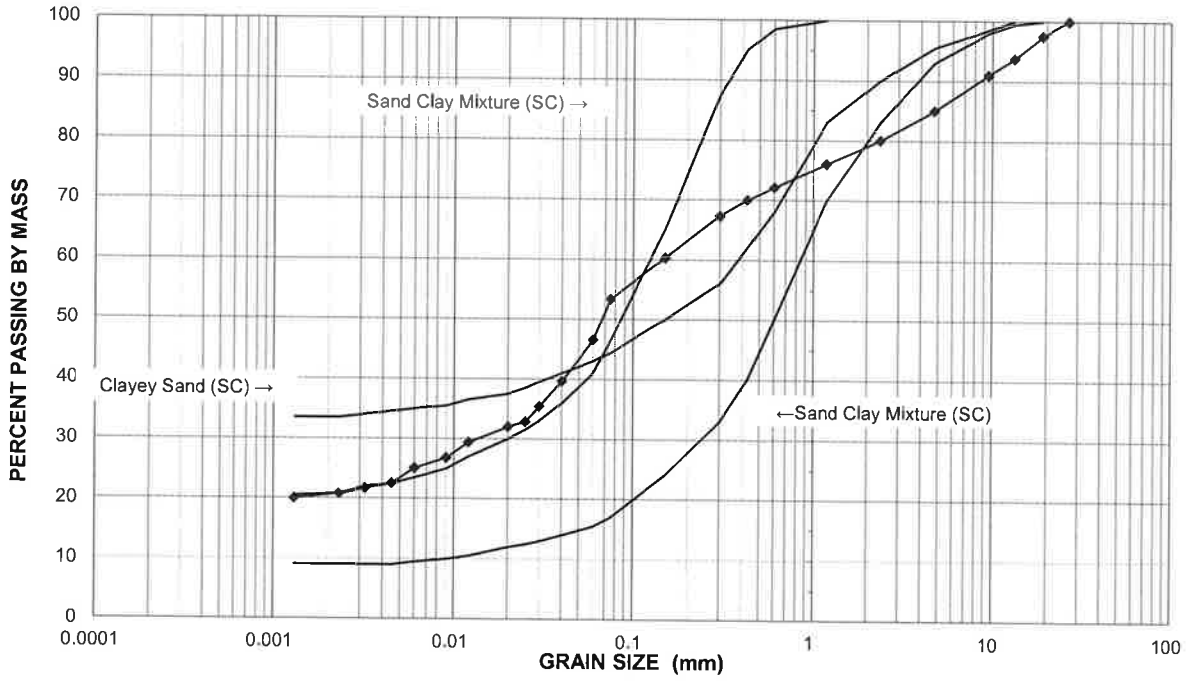
1260 - 2nd Avenue E., Unit 1 Owen Sound, ON N4K 2J3

Phone 519-376-1805 Fax 519-376-8977 www.GMBluePlan.ca

PARTICLE SIZE ANALYSIS

PROJECT:	Geotechnical Investigation - Telfer Creek Square	FILE NO.:	219112-1
LOCATION:	2275 16th Street East, Owen Sound	LAB SAMPLE NO.:	S-4007
CLIENT :	Exquisite Real Estate Holdings Ltd.	SAMPLE DATE:	February 26, 2021
SOIL TYPE:	Clayey Silt with some Sand and a little Gravel	SAMPLED BY:	E.W
GRAPH # :	8 - Clayey Sands, Sand-Clay Mixtures	SOURCE:	BH-3 @ 2.5' to 4.5'

PARTICLE SIZE DISTRIBUTION



←		FINE	MEDIUM	COARSE	FINE	COARSE
CLAY	SILT	SAND			GRAVEL	

SIEVE SIZE PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE	HYDROMETER PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE
26.5	100.0	0.0600	46.5
19	97.5	0.0400	39.7
13.2	93.8	0.0300	35.4
9.5	91.0	0.0250	32.8
4.75	85.0	0.0200	31.9
2.36	80.1	0.0120	29.4
1.180	76.1	0.0090	26.8
0.600	72.1	0.0060	25.1
0.425	70.0	0.0045	22.5
0.300	67.3	0.0032	21.7
0.150	60.3	0.0023	20.8
0.075	53.4	0.0013	20.0

D_{10} : 0.00003 mm **D_{60} : 0.15 mm** **Cu : 5000**

Coefficient of Permeability: 9×10^{-10} cm/sec **"T" Time : mins/cm**

Comments: D10 value is extrapolated.

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA

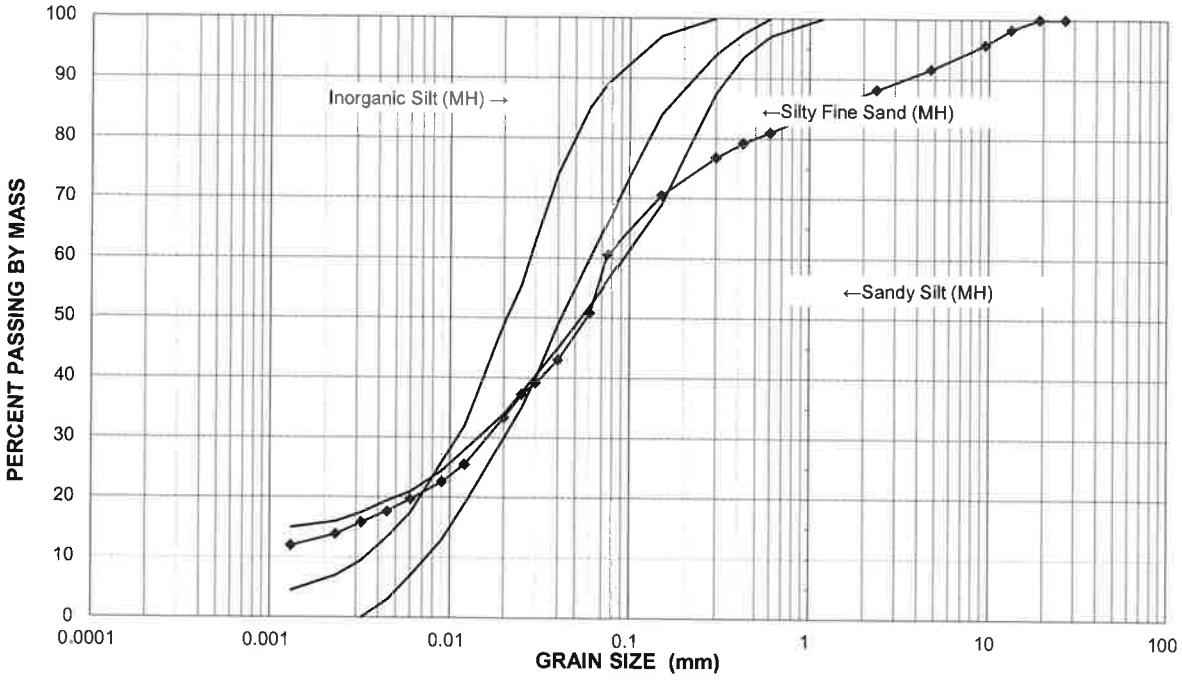
1260 - 2nd Avenue E., Unit 1 Owen Sound, ON N4K 2J3

Phone 519-376-1805 Fax 519-376-8977 www.GMBluePlan.ca

PARTICLE SIZE ANALYSIS

PROJECT:	Geotechnical Investigation - Telfer Creek Square	FILE NO.:	219112-1
LOCATION:	2275 16th Street East, Owen Sound	LAB SAMPLE NO.:	S-4006
CLIENT :	Exquisite Real Estate Holdings Ltd.	SAMPLE DATE:	March 8, 2021
SOIL TYPE:	Sandy Silt with a little Clay and Gravel	SAMPLED BY:	E.W
GRAPH # :	12 - Inorganic Silts	SOURCE:	BH-6 @ 7.5' to 9.5'

PARTICLE SIZE DISTRIBUTION



←		FINE	MEDIUM	COARSE	FINE	COARSE
CLAY	SILT	SAND			GRAVEL	

SIEVE SIZE PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE	HYDROMETER PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE
26.5	100.0	0.0600	50.8
19	100.0	0.0400	43.0
13.2	98.3	0.0300	39.2
9.5	95.7	0.0250	37.2
4.75	91.7	0.0200	33.3
2.36	88.3	0.0120	25.6
1.180	84.7	0.0090	22.6
0.600	81.0	0.0060	19.7
0.425	79.2	0.0045	17.8
0.300	76.8	0.0032	15.8
0.150	70.5	0.0023	13.9
0.075	60.6	0.0013	12.0

D_{10} : 0.0006 mm **D_{60} :** 0.07 mm **Cu :** 117

Coefficient of Permeability: 3.6×10^{-7} cm/sec **"T" Time :** mins/cm

Comments: D10 value is extrapolated.

APPENDIX C:
ANALYTICAL & CERTIFICATE OF LABORATORY ANALYSIS – ENVIRONMENTAL SOIL DATA

Your P.O. #: 219112-1
Your Project #: 219112-1
Site Location: 2275 16TH STREET EAST OWEN SOUND
Your C.O.C. #: na

Attention: Reporting Contacts

GM BluePlan Engineering Limited
1260 - 2nd Ave E
Unit 1
Owen Sound, ON
CANADA N4K 2J3

Report Date: 2021/03/11
Report #: R6550499
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C158984
Received: 2021/03/05, 09:17

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Hot Water Extractable Boron	3	2021/03/08	2021/03/08	CAM SOP-00408	R153 Ana. Prot. 2011
Free (WAD) Cyanide	3	2021/03/08	2021/03/09	CAM SOP-00457	OMOE E3015 m
Conductivity	3	2021/03/10	2021/03/10	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	3	2021/03/09	2021/03/09	CAM SOP-00436	EPA 3060/7199 m
Strong Acid Leachable Metals by ICPMS	3	2021/03/08	2021/03/09	CAM SOP-00447	EPA 6020B m
Moisture	3	N/A	2021/03/06	CAM SOP-00445	Carter 2nd ed 51.2 m
pH CaCl2 EXTRACT	3	2021/03/09	2021/03/09	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	3	N/A	2021/03/10	CAM SOP-00102	EPA 6010C

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Your P.O. #: 219112-1
Your Project #: 219112-1
Site Location: 2275 16TH STREET EAST OWEN SOUND
Your C.O.C. #: na

Attention: Reporting Contacts

GM BluePlan Engineering Limited
1260 - 2nd Ave E
Unit 1
Owen Sound, ON
CANADA N4K 2J3

Report Date: 2021/03/11
Report #: R6550499
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C158984
Received: 2021/03/05, 09:17

Encryption Key

Bureau Veritas
11 Mar 2021 09:05:42

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ashton Gibson, Project Manager
Email: Ashton.Gibson@bureauveritas.com
Phone# (905)817-5765

==========

This report has been generated and distributed using a secure automated process.
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: C158984
Report Date: 2021/03/11

GM BluePlan Engineering Limited
Client Project #: 219112-1
Site Location: 2275 16TH STREET EAST OWEN SOUND
Your P.O. #: 219112-1
Sampler Initials: EW

O.REG 153 METALS & INORGANICS PKG (SOIL)

BV Labs ID		OZP880	OZP881			OZP881			OZP882		
Sampling Date		2021/02/25	2021/02/25			2021/02/25			2021/02/25		
COC Number		na	na			na			na		
	UNITS	BH-10	BH-11	RDL	QC Batch	BH-11 Lab-Dup	RDL	QC Batch	BH-14	RDL	QC Batch
Calculated Parameters											
Sodium Adsorption Ratio	N/A	0.51	0.26		7231383				0.25 (1)		7231383
Inorganics											
Conductivity	mS/cm	0.17	0.16	0.002	7238607	0.16	0.002	7238607	0.17	0.002	7238607
Moisture	%	8.5	13	1.0	7233756				11	1.0	7233756
Available (CaCl2) pH	pH	7.86	7.75		7236521				7.85		7236521
WAD Cyanide (Free)	ug/g	<0.01	<0.01	0.01	7234567				<0.01	0.01	7234567
Chromium (VI)	ug/g	<0.18	<0.18	0.18	7236243				<0.18	0.18	7236243
Metals											
Hot Water Ext. Boron (B)	ug/g	0.13	0.11	0.050	7234924				0.073	0.050	7234924
Acid Extractable Antimony (Sb)	ug/g	<0.20	<0.20	0.20	7234952				<0.20	0.20	7234952
Acid Extractable Arsenic (As)	ug/g	4.5	5.2	1.0	7234952				3.5	1.0	7234952
Acid Extractable Barium (Ba)	ug/g	24	31	0.50	7234952				24	0.50	7234952
Acid Extractable Beryllium (Be)	ug/g	0.38	0.57	0.20	7234952				0.40	0.20	7234952
Acid Extractable Boron (B)	ug/g	14	19	5.0	7234952				14	5.0	7234952
Acid Extractable Cadmium (Cd)	ug/g	<0.10	<0.10	0.10	7234952				<0.10	0.10	7234952
Acid Extractable Chromium (Cr)	ug/g	12	16	1.0	7234952				12	1.0	7234952
Acid Extractable Cobalt (Co)	ug/g	7.1	9.7	0.10	7234952				7.0	0.10	7234952
Acid Extractable Copper (Cu)	ug/g	22	38	0.50	7234952				26	0.50	7234952
Acid Extractable Lead (Pb)	ug/g	4.6	6.1	1.0	7234952				4.3	1.0	7234952
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	0.50	0.50	7234952				<0.50	0.50	7234952
Acid Extractable Nickel (Ni)	ug/g	16	21	0.50	7234952				15	0.50	7234952
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	0.50	7234952				<0.50	0.50	7234952
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	0.20	7234952				<0.20	0.20	7234952
Acid Extractable Thallium (Tl)	ug/g	0.082	0.13	0.050	7234952				0.11	0.050	7234952
Acid Extractable Uranium (U)	ug/g	0.40	0.49	0.050	7234952				0.42	0.050	7234952
Acid Extractable Vanadium (V)	ug/g	15	21	5.0	7234952				17	5.0	7234952
Acid Extractable Zinc (Zn)	ug/g	29	37	5.0	7234952				29	5.0	7234952
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	0.050	7234952				<0.050	0.050	7234952

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: C158984
Report Date: 2021/03/11

GM BluePlan Engineering Limited
Client Project #: 219112-1
Site Location: 2275 16TH STREET EAST OWEN SOUND
Your P.O. #: 219112-1
Sampler Initials: EW

O.REG 153 METALS & INORGANICS PKG (SOIL)

BV Labs ID		OZP882		
Sampling Date		2021/02/25		
COC Number		na		
	UNITS	BH-14 Lab-Dup	RDL	QC Batch
Inorganics				
Moisture	%	12	1.0	7233756
Metals				
Hot Water Ext. Boron (B)	ug/g	0.073	0.050	7234924

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: C158984
Report Date: 2021/03/11

GM BluePlan Engineering Limited
Client Project #: 219112-1
Site Location: 2275 16TH STREET EAST OWEN SOUND
Your P.O. #: 219112-1
Sampler Initials: EW

TEST SUMMARY

BV Labs ID: OZP880
Sample ID: BH-10
Matrix: Soil

Collected: 2021/02/25
Shipped:
Received: 2021/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	7234924	2021/03/08	2021/03/08	Archana Patel
Free (WAD) Cyanide	TECH	7234567	2021/03/08	2021/03/09	Louise Harding
Conductivity	AT	7238607	2021/03/10	2021/03/10	Tarunpreet Kaur
Hexavalent Chromium in Soil by IC	IC/SPEC	7236243	2021/03/09	2021/03/09	Violeta Porcila
Strong Acid Leachable Metals by ICPMS	ICP/MS	7234952	2021/03/08	2021/03/09	Viviana Canzonieri
Moisture	BAL	7233756	N/A	2021/03/06	Mithunaa Sasitheepan
pH CaCl2 EXTRACT	AT	7236521	2021/03/09	2021/03/09	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	7231383	N/A	2021/03/10	Automated Statchk

BV Labs ID: OZP881
Sample ID: BH-11
Matrix: Soil

Collected: 2021/02/25
Shipped:
Received: 2021/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	7234924	2021/03/08	2021/03/08	Archana Patel
Free (WAD) Cyanide	TECH	7234567	2021/03/08	2021/03/09	Louise Harding
Conductivity	AT	7238607	2021/03/10	2021/03/10	Tarunpreet Kaur
Hexavalent Chromium in Soil by IC	IC/SPEC	7236243	2021/03/09	2021/03/09	Violeta Porcila
Strong Acid Leachable Metals by ICPMS	ICP/MS	7234952	2021/03/08	2021/03/09	Viviana Canzonieri
Moisture	BAL	7233756	N/A	2021/03/06	Mithunaa Sasitheepan
pH CaCl2 EXTRACT	AT	7236521	2021/03/09	2021/03/09	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	7231383	N/A	2021/03/10	Automated Statchk

BV Labs ID: OZP881 Dup
Sample ID: BH-11
Matrix: Soil

Collected: 2021/02/25
Shipped:
Received: 2021/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	7238607	2021/03/10	2021/03/10	Tarunpreet Kaur

BV Labs ID: OZP882
Sample ID: BH-14
Matrix: Soil

Collected: 2021/02/25
Shipped:
Received: 2021/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	7234924	2021/03/08	2021/03/08	Archana Patel
Free (WAD) Cyanide	TECH	7234567	2021/03/08	2021/03/09	Louise Harding
Conductivity	AT	7238607	2021/03/10	2021/03/10	Tarunpreet Kaur
Hexavalent Chromium in Soil by IC	IC/SPEC	7236243	2021/03/09	2021/03/09	Violeta Porcila
Strong Acid Leachable Metals by ICPMS	ICP/MS	7234952	2021/03/08	2021/03/09	Viviana Canzonieri
Moisture	BAL	7233756	N/A	2021/03/06	Mithunaa Sasitheepan
pH CaCl2 EXTRACT	AT	7236521	2021/03/09	2021/03/09	Neil Dassanayake
Sodium Adsorption Ratio (SAR)	CALC/MET	7231383	N/A	2021/03/10	Automated Statchk

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: C158984
Report Date: 2021/03/11

GM BluePlan Engineering Limited
Client Project #: 219112-1
Site Location: 2275 16TH STREET EAST OWEN SOUND
Your P.O. #: 219112-1
Sampler Initials: EW

TEST SUMMARY

BV Labs ID: OZP882 Dup
Sample ID: BH-14
Matrix: Soil

Collected: 2021/02/25
Shipped:
Received: 2021/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	7234924	2021/03/08	2021/03/08	Archana Patel
Moisture	BAL	7233756	N/A	2021/03/06	Mithunaa Sasitheepan

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: C158984
Report Date: 2021/03/11

GM BluePlan Engineering Limited
Client Project #: 219112-1
Site Location: 2275 16TH STREET EAST OWEN SOUND
Your P.O. #: 219112-1
Sampler Initials: EW

GENERAL COMMENTS

Results relate only to the items tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: C158984
Report Date: 2021/03/11

QUALITY ASSURANCE REPORT

GM BluePlan Engineering Limited
Client Project #: 219112-1
Site Location: 2275 16TH STREET EAST OWEN SOUND
Your P.O. #: 219112-1
Sampler Initials: EW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7233756	Moisture	2021/03/06							4.3	20
7234567	WAD Cyanide (Free)	2021/03/09	89	75 - 125	99	80 - 120	<0.01	ug/g	25	35
7234924	Hot Water Ext. Boron (B)	2021/03/08	104	75 - 125	95	75 - 125	<0.050	ug/g	0	40
7234952	Acid Extractable Antimony (Sb)	2021/03/09	92	75 - 125	99	80 - 120	<0.20	ug/g	NC	30
7234952	Acid Extractable Arsenic (As)	2021/03/09	101	75 - 125	99	80 - 120	<1.0	ug/g	2.7	30
7234952	Acid Extractable Barium (Ba)	2021/03/09	NC	75 - 125	99	80 - 120	<0.50	ug/g	0.50	30
7234952	Acid Extractable Beryllium (Be)	2021/03/09	110	75 - 125	106	80 - 120	<0.20	ug/g	1.7	30
7234952	Acid Extractable Boron (B)	2021/03/09	103	75 - 125	104	80 - 120	<5.0	ug/g	0.21	30
7234952	Acid Extractable Cadmium (Cd)	2021/03/09	102	75 - 125	97	80 - 120	<0.10	ug/g	1.1	30
7234952	Acid Extractable Chromium (Cr)	2021/03/09	101	75 - 125	98	80 - 120	<1.0	ug/g	1.7	30
7234952	Acid Extractable Cobalt (Co)	2021/03/09	100	75 - 125	98	80 - 120	<0.10	ug/g	0.035	30
7234952	Acid Extractable Copper (Cu)	2021/03/09	NC	75 - 125	96	80 - 120	<0.50	ug/g	0.31	30
7234952	Acid Extractable Lead (Pb)	2021/03/09	109	75 - 125	93	80 - 120	<1.0	ug/g	6.6	30
7234952	Acid Extractable Mercury (Hg)	2021/03/09	81	75 - 125	82	80 - 120	<0.050	ug/g	10	30
7234952	Acid Extractable Molybdenum (Mo)	2021/03/09	101	75 - 125	96	80 - 120	<0.50	ug/g	NC	30
7234952	Acid Extractable Nickel (Ni)	2021/03/09	NC	75 - 125	98	80 - 120	<0.50	ug/g	0.40	30
7234952	Acid Extractable Selenium (Se)	2021/03/09	102	75 - 125	97	80 - 120	<0.50	ug/g	NC	30
7234952	Acid Extractable Silver (Ag)	2021/03/09	102	75 - 125	97	80 - 120	<0.20	ug/g	NC	30
7234952	Acid Extractable Thallium (Tl)	2021/03/09	95	75 - 125	94	80 - 120	<0.050	ug/g	3.0	30
7234952	Acid Extractable Uranium (U)	2021/03/09	97	75 - 125	94	80 - 120	<0.050	ug/g	2.0	30
7234952	Acid Extractable Vanadium (V)	2021/03/09	NC	75 - 125	96	80 - 120	<5.0	ug/g	0.64	30
7234952	Acid Extractable Zinc (Zn)	2021/03/09	NC	75 - 125	96	80 - 120	<5.0	ug/g	1.3	30
7236243	Chromium (VI)	2021/03/09	85	70 - 130	91	80 - 120	<0.18	ug/g	NC	35
7236521	Available (CaCl2) pH	2021/03/09			100	97 - 103			0.23	N/A

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: C158984
Report Date: 2021/03/11

QUALITY ASSURANCE REPORT(CONT'D)

GM BluePlan Engineering Limited
Client Project #: 219112-1
Site Location: 2275 16TH STREET EAST OWEN SOUND
Your P.O. #: 219112-1
Sampler Initials: EW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7238607	Conductivity	2021/03/10			103	90 - 110	<0.002	mS/cm	0.90	10

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

BV Labs Job #: C158984
Report Date: 2021/03/11

GM BluePlan Engineering Limited
Client Project #: 219112-1
Site Location: 2275 16TH STREET EAST OWEN SOUND
Your P.O. #: 219112-1
Sampler Initials: EW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Anastassia Hamanov, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com