# APPENDIX G

## Background Reports

**Soil Engineers Ltd.**
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

| BARRIE | MISSISSAUGA | OSHAWA | NEWMARKET | GRAVENHURST | HAMILTON |
|---|---|---|---|---|---|
| TEL: (705) 721-7863 | TEL: (905) 542-7605 | TEL: (905) 440-2040 | TEL: (905) 853-0647 | TEL: (705) 684-4242 | TEL: (905) 777-7956 |
| FAX: (705) 721-7864 | FAX: (905) 542-2769 | FAX: (905) 725-1315 | FAX: (905) 881-8335 | FAX: (705) 684-8522 | FAX: (905) 542-2769 |

**A REPORT TO**
**FLATO DEVELOPMENTS INC.**

# A GEOTECHNICAL INVESTIGATION FOR PROPOSED RESIDENTIAL DEVELOPMENT

**PART OF LOTS 225 AND 226 CONCESSION 2**
**TOWNSHIP OF SOUTHGATE (DUNDALK)**

**REFERENCE NO. 2210-S028C**

**JANUARY 2023**

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## ENCLOSURES

## 1.0 INTRODUCTION

In accordance with a written authorization from Ms. Nazy Majidi of Flato Developments Inc. dated September 20, 2022, Soil Engineers Ltd. was retained to carry out a geotechnical review based on the monitoring well logs and groundwater monitoring data prepared by SLR Consulting (Canada) Ltd. (SLR) at a land parcel with the legal description of "Part of Lots 225 and 226, Concession 2, Southwest of the Toronto and Sydenham Road, Geographic Township of Proton, Township of Southgate, County of Grey".

The purpose of this review was to evaluate the subsurface conditions and determine the engineering properties of the disclosed soils from SLR boreholes for the design and construction of the proposed residential development. The geotechnical findings and resulting recommendations are presented in this report.

## 2.0 SITE AND PROJECT DESCRIPTION

The Township of Southgate (Dundalk) is situated in the physiographic region known as Dundalk Till Plain, where moraines and eskers occur in areas that have been partly eroded by glacial Lake Algonquin and filled with lacustrine sands, silts, and reworked till.

The subject site, approximately 32 hectares in area, is currently a vacant farm field with a wooded area occupying the eastern portion of the site. It is located to the north of the Grey County CP Rail Trail and northwest of Todd Crescent, in the Township of Southgate. The existing site gradient is undulating, with a slight drop towards the west and centre of the site.

Based on the Draft Plan of Subdivision prepared by MHBC Planning dated August 18, 2022, the subject site will be developed into a residential subdivision with a park block and a stormwater management (SWM) pond. The subdivision will be serviced with municipal sewers and roadways meeting urban standards.

## 3.0 FIELD WORK AND LABORATORY TESTS

The field work, consisting of five (5) boreholes extending to depths of 5.33 to 12.95 m, was supervised by SLR between April 19 and May 5, 2022. Upon the completion of drilling and sampling, six (6) monitoring wells, including a pair of nested wells, were installed in all borehole locations to facilitate groundwater monitoring and hydrogeological study. All

borehole and monitoring well locations are shown on the Borehole and Monitoring Well Location Plan, Drawing No. 1.

Standard Penetration Tests (SPT) were performed at regular sample interval to determine the Standard Penetration Resistance (or 'N' values) of the subsoil. The relative density of the non-cohesive strata is inferred from the 'N' values. The results of the SPT were documented in the Monitoring Well Logs in Appendix A of this report.

Aside from the SPT during the field work, grain size analyses were also performed on selected soil samples to determine the gradation of the subsoils. The gradation graphs were presented in Appendix B of this report.

## 4.0 SUBSURFACE CONDITIONS

The investigation revealed that beneath a topsoil veneer, the site is underlain by strata of sandy silt till/silty sand till, and sand deposits.

Detailed descriptions of the encountered subsurface conditions are presented on SLR Monitoring Well Logs attached in the Appendix A. The engineering properties of the disclosed soils are discussed herein.

### 4.1 Topsoil

The topsoil veneer, 13 to 46 cm in thickness, was contacted at the ground surface in all boreholes. Thicker topsoil may be found in areas beyond the borehole locations, especially in low-lying areas and treed areas.

### 4.2 Silty Sand Till/Sandy Silt Till

The native silty sand till/sandy silt till predominates the soil stratigraphy within the depth of the investigation. The tills consist of a random mixture of soil particle sizes ranging from clay to gravel, with silt and sand being the dominant influence on its soil properties. Two (2) grainsize analyses were performed on the till deposits and their gradations were presented in Appendix B of this report.

The obtained 'N' values of the till samples range from 6 to over 50, with a median of over 50 blows per 30 cm of penetration, indicating the till deposit is loose to very dense, being

generally very dense in relative density. Occasional cobbles, boulders and rock fragments were identified within the till samples by SLR.

SLR indicated that the till samples were generally in moist conditions, with localized wet sand layers at various depths.

The engineering properties of the till deposit are listed below:

- High frost susceptibility and low water erodibility.
- The till will be stable in relatively steep excavation; however, localized sheet collapse may occur under prolonged exposure.

### 4.3 Sand

The sand deposit was generally found near the ground surface or between the till deposits in MW22-312, MW22-314 and MW22-315. It is generally fine to coarse grained and contains a trace of gravel to being gravelly. One (1) grain size was carried out in the sand and gravel deposit and the gradation is presented in Appendix B of this report.

The obtained 'N' values of the sand range between 4 and over 50 blows per 30 cm of penetration, indicating the sand is very loose to very dense in relative density. The low 'N' value of 4 was contacted near the ground surface, likely being disturbed by farming activities or weakened by weathering process.

According to SLR's sample examination, the sand deposit near the ground surface was in moist condition, while the sand deposit at deeper depths is wet.

The engineering properties of the sand deposit are given below:

- Low frost-susceptibility and high water erodibility
- In excavation, the sand will slough to its angle of repose, run with water seepage and boil with a piezometric head of about 0.3 m.

## 5.0 GROUNDWATER CONDITION

Groundwater levels were recorded in the monitoring wells on May 13, 2022, and the records are presented on the logs and summarized in Table 1.

**Table 1 -** Groundwater Level in Monitoring Wells

| Monitoring Well No. | Well Depth (m) | Ground Elevation (m) | May 13, 2022 | |
|---|---|---|---|---|
| | | | Depth (m) | Elevation (m) |
| MW22-312 | 4.57 | 520.61 | 0.20 | 520.41 |
| MW22-313D | 10.67 | 520.00 | 4.87 | 515.13 |
| MW22-313S | 5.94 | 520.03 | 0.37 | 519.66 |
| MW22-314 | 6.10 | 517.28 | 0.58 | 516.70 |
| MW22-315 | 12.19 | 518.81 | 2.97 | 515.84 |
| MW22-316 | 9.14 | 520.07 | 1.40 | 518.67 |

Groundwater was recorded at a depth of 0.20 to 4.87 m from the prevailing ground surface, or between El. 515.13 m and El. 520.41 m. On-going groundwater monitoring will be completed by SLR and presented in the hydrogeological report under separate cover.

## 6.0 DISCUSSION AND RECOMMENDATIONS

The investigation revealed that beneath a topsoil veneer, the site is underlain by strata of sandy silt till/silty sand till, sand deposits.

Groundwater was recorded at a depth of 0.20 to 4.87 m from the prevailing ground surface, or between El. 515.13 m and El. 520.41 m.

It is understood that subject site will be developed into a residential subdivision with a park block and a stormwater management (SWM) pond. The geotechnical findings warranting special consideration for the proposed development are presented below:

- The topsoil must be removed for site development. The topsoil can be re-used for landscaping only. Any surplus should be removed off-site
- Where the surface soil is weathered or disturbed, it should be subexcavated and inspected before reusing for structural backfill.
- In areas where the site will be regraded with additional fill, the earth fill can be placed in an engineered manner for foundation, site services and pavement construction.
- The proposed residential houses can be supported on conventional spread and strip footings founded on engineered fill or undisturbed native subsoil. The foundation subgrade must be inspected by a geotechnical engineer, or a senior geotechnical

technician, to ensure that the revealed conditions are compatible with the design of foundations.

- For conventional basement design, the foundation wall should be damp-proofed and provided with perimeter subdivisions at wall base. Where wet subgrade is evident below the basement slab, underfloor weepers must be considered.
- A Class 'B' bedding, consisting of compacted 19-mm Crusher-Run Limestone (CRL), or equivalent, is recommended for the construction of the underground utilities. Where wet subgrade or dewatering is required, A Class 'A' concrete bedding should be used instead.

The recommendations appropriate for the project are presented herein. One must be aware that the subsurface conditions may vary. Should this become apparent during construction, a geotechnical engineer must be consulted to determine whether the following recommendations require revision.

## 6.1 Site Preparation

In areas where the site will be regraded with additional fill, the earth fill should be place in an engineered manner for foundation, site services and pavement construction. The engineering requirements for a certifiable fill are presented below:

1. All the existing topsoil must be removed. Any weathered/disturbed soil encountered on the ground surface should be subexcavated, sorted free of organics or deleterious material, if any, aerated before reusing for structural backfill. The exposed subgrade must be inspected and proof-rolled prior to any fill placement.
2. Inorganic soils must be used, and they must be uniformly compacted in 20 cm thick lifts to at least 98% Standard Proctor dry density (SPDD) up to the proposed finished grade. The soil moisture must be properly controlled near the optimum. If the foundations are to be built soon after the fill placement, the densification process for the engineered fill must be increased to 100% SPDD.
3. If the engineered fill is compacted with the moisture content on the wet side of the optimum, the underground services and pavement construction should not begin until the pore pressure within the fill mantle has completely dissipated. This must be further assessed at the time of the engineered fill construction.
4. If imported fill is to be used, it should be inorganic soils, free of deleterious or any material with environmental issue (contamination). Any potential imported earth fill from off site must be reviewed for geotechnical and environmental quality by the

appropriate personnel as authorized by the developer or agency, before it is hauled to the site.

5. The engineered fill must not be placed during the period where freezing ambient temperatures occur either persistently or intermittently. This is to ensure that the fill is free of frozen soils, ice and snow. If the engineered fill is to be left over the winter months, adequate earth cover, or equivalent, must be provided for protection against frost action.
6. The fill operation must be supervised and monitored on a full-time basis by a technician under the direction of a geotechnical engineer.
7. The engineered fill envelope and finished elevations must be clearly and accurately defined in the field, and they must be precisely documented.
8. The foundations and underground services subgrade must be inspected by the geotechnical consulting firm that inspected the engineered fill placement. This is to ensure that the foundations are placed within the engineered fill envelope, and the integrity of the fill has not been compromised by interim construction, environmental degradation and/or disturbance by the footing excavation.
9. Any excavation carried out in certified engineered fill must be reported to the geotechnical consultant who supervised the fill placement in order to document the locations of the excavation and/or to supervise reinstatement of the excavated areas to engineered fill status. If construction on the engineered fill does not commence within a period of 2 years from the date of certification, the condition of the engineered fill must be assessed for re-certification.
10. Despite stringent control in the placement of the engineered fill, variations in soil type and density may occur in the engineered fill. Therefore, the foundations must be reinforced and designed by a structural engineer.
11. In sewer construction, the engineered fill is considered to have the same structural proficiency as a natural inorganic soil.

## 6.2 **Foundations**

The proposed residential dwellings can be constructed on conventional footings founded on the undisturbed native soil or engineered fill. The recommended bearing pressures for conventional footing design are presented below:

- Maximum Soil Bearing Pressure at Serviceability Limit State (SLS) = 150 kPa
- Factored Ultimate Bearing Pressure at Ultimate Limit State (ULS) = 250 kPa

The total and differential settlements of the conventional spread and strip footings, designed for the bearing pressure at SLS, are estimated to be 25 mm and 20 mm, respectively.

The footing subgrade must be inspected by a geotechnical engineer, or a geotechnical technician under the supervision of a geotechnical engineer; this is to ensure that the subgrade conditions are compatible with the foundation design requirements.

Where water seepage is encountered during footing excavations, or where the subgrade of the foundations is found to be wet, the subgrade should be protected by a concrete mud-slab immediately after exposure and inspection. This will prevent construction disturbance and costly rectification.

Footings exposed to weathering or in unheated areas, should have at least 1.6 m of earth cover for protection against frost action or must be adequately insulated.

The foundations shall meet the requirements specified in the latest Ontario Building Code. The proposed development should be designed to resist an earthquake force using Site Classification 'D' (stiff soil).

## 6.3 Basement Construction

The basement walls should be designed to sustain a lateral earth pressure calculated using the soil parameters stated in Section 6.8. Any applicable surcharge loads beside the basement must also be included in the design of underground structure.

In conventional design, perimeter subdrains and damp-proofing of the foundation walls will be required. The subdrains should be encased in a fabric filter to protect them against blockage by silting and connected to a positive outlet. Typical details of the perimeter subdrain are illustrated on Drawing No. 2.

Where wet subgrade is evident below the basement, underfloor weepers should be implemented. In addition, a vapour barrier should also be placed between the concrete slab and the granular bedding to prevent upfiltration of water vapour. Details of the underfloor weepers are illustrated on Drawing No. 3. The necessity of the underfloor weepers should be further verified once the basement elevation is available for review.

The subgrade must consist of sound native soils or properly compacted inorganic fill. Any weak or wet soil should be subexcavated and replaced with suitable inorganic soil compacted

to at least 98% SPDD. The final subgrade must be inspected and assessed by proof-rolling prior to placement of granular bedding.

The basement floor slab should be constructed on a granular bedding, at least 20 cm in thickness, consisting of 19-mm CRL, or equivalent, compacted to 100% SPDD. Where underfloor weepers are required, the thickness of the granular bedding should be increased to 30 cm in thickness.

The exterior grading around the buildings must be such that it directs runoff away from the structures.

## 6.4 Underground Services

The subgrade for underground services should consist of properly compacted inorganic earth fill or sound native soils. Where weak or wet subgrade is encountered, it can be further subexcavated to competent soil and replaced with bedding material compacted to 98% SPDD in lifts no more than 20 cm in thickness.

A Class 'B' bedding, consisting of compacted 19-mm CRL or equivalent, is recommended for the design of the underground services construction. Where saturated soils and/or dewatering is required for the construction of the underground services, Class 'A' concrete bedding should be used instead.

In order to prevent pipe floatation when the sewer trench is deluged with water, a soil cover with a thickness equal to two times the pipe diameter should be in place at all times after completion of the pipe installation.

The pipe joints connecting into manholes and catch basins should be leak-proof or wrapped with a waterproof membrane. Openings to subdrains should be shielded by a fabric filter to prevent blockage by silting.

All metal fittings for the underground services should be protected against soil corrosion. The in-situ soils have moderately high corrosivity to buried metal. In determining the mode of protection, an estimated electrical resistivity of the disclosed soil should be used and must meet the minimum requirement as specified by the Municipality.

## 6.5 Backfilling in Trenches and Excavation

The on-site inorganic soils are suitable in general to be reused for structural backfill. However, the wet soils, if any, should be spread thinly on the ground to allow aeration in warm and dry weather prior to be reused for structural backfill. They should be free of deleterious materials or oversized (over 15 cm) boulders and cobbles.

The backfill in service trenches or beside foundation walls should be compacted to at least 95% SPDD. In zone within 1.0 m below the pavement subgrade or floor slab, the subgrade must be compacted to at least 98% SPDD. The lift thickness should be limited to 20 cm, or the lift thickness should be determined by test strips.

In normal construction practice, the problem areas of pavement settlement largely occur adjacent to foundation walls, manholes, catch basins and services crossings. In areas which are inaccessible to a heavy compactor, granular backfill should be used in order to achieve the compaction with a light equipment.

One must be aware of the possible consequences during trench backfilling and exercise caution as described below:

- When construction is carried out in freezing winter weather, allowance should be made for these following conditions. Despite stringent backfill monitoring, frozen soil layers may inadvertently be mixed with the structural trench backfill. Should the in-situ soils have a water content on the dry side of the optimum, it would be impossible to wet the soils due to the freezing condition, rendering difficulties in obtaining uniform and proper compaction. Furthermore, the freezing condition will prevent wetting of the backfill when it is required, such as in a narrow vertical trench section, or when the trench box is removed. The above will invariably cause backfill settlement that may become evident within 1 to several years, depending on the depth of the trench which has been backfilled.
- In areas where the construction is carried out during the winter months, prolonged exposure of the trench walls will result in frost heave within the soil mantle of the walls. This may result in some settlement as the frost recedes, and repair costs will be incurred prior to final surfacing of the new pavement and the slab-on-grade construction.
- In deep trench backfill, one must be aware that future settlement may occur, unless the side of the cut is flattened to at least 2H:1V, and the lifts of the fill and its moisture content are stringently controlled; i.e., lifts should be no more than 20 cm (or less if the

backfilling conditions dictate) and uniformly compacted to achieve at least 98% SPDD, with the moisture content controlled near the optimum.

- It is often difficult to achieve uniform compaction of the backfill in the lower vertical section of a trench which is stabilized by a trench box. These sectors must be backfilled with sand or non shrinkable fill, and the compaction must be carried out diligently prior to the placement of the backfill above this sector; i.e., in the upper sloped trench section. This measure is necessary in order to prevent consolidation of inadvertent voids and loose backfill which will compromise the compaction of the backfill in the upper section.
- In areas where groundwater movement is expected in the trench backfill, anti-seepage collars (OPSS 802.095) should be provided.

## 6.6 Garages and Driveways

Due to the frost susceptible characteristics of the subgrade soils, heaving of the pavement is anticipated during cold weather and the surface structures should be designed to tolerate the movement.

The driveway leading to the garage should be backfilled with non-frost susceptible granular material with a frost taper at a slope of 1H:1V or gentler. The subgrade of the garage floor and the interior garage foundation walls should be insulated with 75-mm Styrofoam, or its thermal equivalent.

The ground surface must be graded to direct water away from the structures to minimize the frost heave phenomenon generally associated with the disclosed soil.

## 6.7 Pavement Design

The recommended pavement design for both Local Road and Collectors is presented in Table 2.

**Table 2 -** Pavement Design

| Course | Thickness (mm) | OPS Specifications |
|---|---|---|
| Asphalt Surface | 40 | HL3 |
| Asphalt Binder<br>- Local Road<br>- Collectors | <br>50<br>70 | HL4 |
| Granular Base | 150 | Granular 'A' or equivalent |
| Granular Sub-base | 450 | Granular 'B' or equivalent |

In preparation of the pavement subgrade, the subgrade must be proof-rolled. Any soft spot identified must be subexcavated, and replaced with inorganic material and properly compacted to at least 98% SPDD, with the water content 2% to 3% drier than the optimum in 20 cm layers, or the lift thickness should be determined by test strips. All the granular bases should be compacted to 100% SPDD.

The pavement subgrade will suffer a strength regression if water is allowed to infiltrate prior to paving. The following measures should be incorporated in the construction procedures and pavement design:

- The lot areas adjacent to the pavement should be properly graded to prevent ponding of water.
- The pavement subgrade should be properly crowned and smooth-rolled to allow interim precipitation to be properly drained.
- Fabric filter-encased curb subdrains on both sides of the roadway are required to meet the Town's requirements.
- If the pavement is to be constructed during the wet seasons and extremely soft subgrade occurs, the granular sub-base may require thickening. This can be further assessed during construction.

## 6.8 Stormwater Management Area (Block 396)

Details of the SWM facility was not provided for review at the time of preparation of this report. Due to the presence of wet silty sand and/or sand deposit in the overburden of the nearby boreholes, where the pond is constructed with sub-excavation into the native ground, a clay liner will likely be required.

Further recommendations can be provided once details of the SWM facility was provided for our review. Additional borehole and laboratory tests may be required to evaluate the need of clay liner and its thickness.

## 6.9 Soil Parameters

The recommended soil parameters for the project design are given in Table 3.

**Table 3** - Soil Parameters

| **Unit Weight and Bulk Factor** | **Unit Weight (kN/m$^3$)** | | **Estimated Bulk Factor** | |
|---|---|---|---|---|
| | **Bulk** | **Submerged** | **Loose** | **Compacted** |
| Silty Sand/Sand | 20.5 | 10.5 | 1.20 | 1.00 |
| Silty Sand Till/Sandy Silt Till | 22.5 | 12.5 | 1.25 | 1.03 |

| **Lateral Earth Pressure Coefficients** | **Active $K_a$** | **At Rest $K_0$** | **Passive $K_p$** |
|---|---|---|---|
| Sand | 0.29 | 0.46 | 3.36 |
| Silty Sand Till/Sandy Silt Till/Silty Sand | 0.30 | 0.40 | 3.33 |

| **Estimated Coefficient of Permeability (K) and Percolation Time (T)** | **K (cm/sec)** | **T (min/cm)** |
|---|---|---|
| Sand | $10^{-2}$ to $10^{-3}$ | 4 to 8 |
| Silty Sand | $10^{-4}$ | 15 |
| Silty Sand Till/Sandy Silt Till | $10^{-4}$ to $10^{-6}$ | 15 to 50 |

| **Estimated California Bearing Ratio** | |
|---|---|
| Sand | 15% |
| Silty Sand/Silty Sand Till/Sandy Sit Till | 5% to 8% |

| **Estimated Electrical Resistivity** | |
|---|---|
| Sand | 5500 ohm·cm |
| Silty Sand/Silty Sand Till/Sandy Silt Till | 4500 ohm·cm |

| **Maximum Allowable Soil Pressure (SLS) For Thrust Block Design** | |
|---|---|
| Engineered Fill and Sound Native Soils | 75 kPa |

| **Coefficients of Friction** | |
|---|---|
| Between Concrete and Granular Base | 0.50 |
| Between Concrete and Sound Native Soil | 0.35 |

## 6.10 Excavation

Excavation should be carried out in accordance with Ontario Regulation 213/91. The types of excavated soils are classified in Table 4.

**Table 4 -** Classification of Soils for Excavation

| Material | Type |
|---|---|
| Silty Sand Till/Sandy Silt Till | 2 |
| Weathered/disturbed Soils, drained Soils | 3 |
| Saturated Soils | 4 |

For excavation within the till deposit, water seepage, if any, is expected to be low in rate and limited in quantity. The seepage can be removed by conventional pumping from sumps. Where the excavation extends into the saturated soils, the water seepage will be appreciable and likely persistent. Dewatering from closely spaced sumps and sump wells may be required. Details related to the rate and volume of dewatering will be discussed in the hydrogeological assessment. The method of dewatering should be confirmed with the hydrogeological consultant and the dewatering contractor.

Prospective contractors should assess the in situ subsurface conditions for excavation by digging test pits to at least 0.5 m below the intended bottom of excavation prior to excavating. These test pits may be allowed to remain open for a few hours to assess its seepage and stability conditions.

# 7.0 LIMITATIONS OF REPORT

This report was prepared by Soil Engineers Ltd. for the account of Flato Developments Inc. and for review by the designated consultants, financial institutions, and government agencies. Use of the report is subject to the conditions and limitations of the contractual agreement.

The material in the report reflects the judgment of Poh Fung Kwok and Kin Fung Li, P.Eng., in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, and/or any reliance on decisions to be made based on it are the responsibility of such Third Parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

**SOIL ENGINEERS LTD.**

Poh Fung (Derek) Kwok, M.Sc.


Kin Fung Li, P.Eng.
PFK/KFL

**Soil Engineers Ltd.**
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

| BARRIE | MISSISSAUGA | OSHAWA | NEWMARKET | GRAVENHURST | HAMILTON |
|---|---|---|---|---|---|
| TEL: (705) 721-7863 | TEL: (905) 542-7605 | TEL: (905) 440-2040 | TEL: (905) 853-0647 | TEL: (705) 684-4242 | TEL: (905) 777-7956 |
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# APPENDIX A

## MONITORING WELL LOGS

## REFERENCE NO. 2210-S028C

SLR CONSULTING (CANADA) LTD.

CLIENT: **Dundalk Village Two Inc.**
PROJECT:
ADDRESS: **Dundalk Northeast Southgate, ON**
SLR JOB NO: **209.30125.00003**

# Monitoring Well LOG

BOREHOLE NO: MW22-312
SURFACE ELEVATION: 520.61 m

| DEPTH (m) | ELEVATION (m) | SOIL DESCRIPTION | SAMPLE ID | % Recovery | TEST DATA: ■SPT Count (10 20 30 40 50) ◆ % Moisture (20 40 60 80 100) | WELL COMPLETION NOTES | ELEVATION (m) |
|---|---|---|---|---|---|---|---|
| 0 | 520.61 | **TOPSOIL** | 0-2 | 91.7 | 4 | | |
| | 520.15 | **Silty SAND TILL**<br>Fine to medium sand, trace silt, trace gravel (sub-angular-angular), brown, orange mottling, loose, soft, wet | | | | | 520 |
| 1 | 519.54 | Fine sand, brown-grey, compact/hard, moist-wet | 2.5-4.5 | 62.5 | 10 | bentonite seal | |
| | 519.09 | No orange mottling onward | | | | | 519 |
| 2 | | | 5-7 | 20.8 | 15 | | |
| | | | 7.5-9.5 | 37.5 | 18 | | 518 |
| 3 | 517.56 | **SAND and GRAVEL**<br>Fine sand, trace coarse sand, trace cobble, trace silt, brown-grey, soft, dense, wet | 10-12 | 20.8 | 38 | silica sand<br>50 mm 010 slot PVC pipe | 517 |
| 4 | | | 12.5-14.5 | 66.7 | 37 | | |
| | 516.04<br>516.01 | Trace gravel, trace silt, grey, dense, moist<br>**Silty SAND TILL**<br>Trace gravel, grey, very dense, very hard, moist | 15-17 | 16.7 | >50 | end cap<br>silica sand | 516 |
| 5 | | | | | | bentonite seal | |

End of monitoring well at 515.28 m

Well Completion Details:
Screened interval from 517.56 m to 516.04 m
Elevation at top of pipe (TOP) = 521.66 m

Groundwater Information:
Depth to groundwater from TOP = 1.25 m (May 13, 2022)

* denotes soil sample taken for lab analysis

DRILLING METHOD: Hollow Stem Auger Drilling
BOREHOLE DIAMETER: 0.2 m (OD)
DRILL DATE: April 20, 2022
LOGGED BY: MJ
DRILLED BY: Geo-Environmental

Notes: SPLIT SPOON

SLR CONSULTING (CANADA) LTD.

CLIENT: **Dundalk Village Two Inc.**
PROJECT:
ADDRESS: **Dundalk Northeast Southgate, ON**
SLR JOB NO: **209.30125.00003**

# Monitoring Well LOG

BOREHOLE NO: MW22-313D
SURFACE ELEVATION: 520.00 m

| DEPTH (m) | ELEVATION (m) | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE ID | % Recovery | SOIL TYPE | TEST DATA: ■SPT Count (10 20 30 40 50) ◆ % Moisture (20 40 60 80100) | WELL COMPLETION | WATER LEVEL | WELL COMPLETION NOTES | ELEVATION (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 520.00 | **TOPSOIL** | | | | | | | | | |
| | 519.87 | Fine sandy silt, organics (rootlets), trace clay, dark brown, soft, moist | | | | | | | | silica sand | |
| | 519.24 | **Sandy SILT TILL** | | | | | | | | | |
| 1 | | Silty, trace medium-coarse sand, trace clay, brown, dark brown mottling, soft, moist, high plasticity | | | | | | | | | 519 |
| | | Trace gravel (sub-angular/sub-rounded), increased gravel with depth, trace cobbles, saturated | | | | | | | | | |
| 2 | | | | | | | | | | | 518 |
| | 517.56 | Silty fine sand, firm-hard, moist | | | | | | | | | |
| 3 | 516.95 | Orange mottling/staining (oxidation) | | | | | | | | | 517 |
| | 516.19 | No recovery | | | | | | | | | |
| 4 | | | | | | | | | | | 516 |
| | 515.43 | **Silty SAND TILL** | | | | | | | | bentonite seal | |
| 5 | | Silty fine sand, some gravel (sub-rounded/sub-angular), firm-hard, moist | | | | | | | ▼ | | 515 |
| 6 | 513.90 | Silty, cobble chips, wet | | 20-22 | 37.5 | | >50 | | | | 514 |
| | 513.14 | Coarse sand, silty, gravel (angular), cobble chips, trace clay, light brown, dense, wet-moist | | 22.5-24.5 | 33.3 | | >50 | | | | |
| 7 | | | | | | | | | | | 513 |
| | | | | 25-27 | 83.3 | | >50 | | | | |
| 8 | | | | | | | | | | | 512 |
| | | | | 27.5-29.5 | 70.8 | | >50 | | | | |
| 9 | | | | | | | | | | | 511 |
| | | | | 30-32 | 33.3 | | >50 | | | | |
| 10 | 510.09 | No Recovery | | | 0.0 | | >50 | | | silica sand<br>50 mm 010 slot<br>PVC pipe | 510 |
| | 509.33 | **Sandy SILT TILL** | | | | | | | | end cap<br>silica sand | |
| 11 | | Fine sand, clay, gravel, light brown, wet | | 35-37 | 20.8 | | >50 | | | bentonite seal | 509 |
| | | End of monitoring well at 508.57 m | | | | | | | | | |
| | | Well Completion Details:<br>Screened interval from 510.86 m to 509.33 m<br>Elevation at top of pipe (TOP) = 521.06 m | | | | | | | | | |
| | | Groundwater Information:<br>Depth to groundwater from TOP = 5.93 m (May 13, 2022) | | | | | | | | | |
| | | * denotes soil sample taken for lab analysis | | | | | | | | | |

DRILLING METHOD: Hollow Stem Auger Drilling
BOREHOLE DIAMETER: 0.2 m (OD)
DRILL DATE: May 5, 2022
LOGGED BY: RH
DRILLED BY: Geo-Environmental

Notes: SPLIT SPOON
NO RECOVERY



SLR BOREHOLE LOG (MOISTURE) 209.30125.00003_MG_2022.08.30.GPJ SLR_CAN V5.2 MOISTURE.GDT 11/17/22

SLR CONSULTING (CANADA) LTD.

CLIENT: **Dundalk Village Two Inc.**
PROJECT:
ADDRESS: **Dundalk Northeast Southgate, ON**
SLR JOB NO: **209.30125.00003**

# Monitoring Well LOG

BOREHOLE NO: MW22-313S
SURFACE ELEVATION: 520.03 m

| DEPTH (m) | ELEVATION (m) | SOIL DESCRIPTION | SAMPLE ID | % Recovery | TEST DATA: SPT Count / % Moisture | WELL COMPLETION NOTES | ELEVATION (m) |
|---|---|---|---|---|---|---|---|
| | 520.03 | | | | | | |
| | 519.90 | **TOPSOIL** Fine sandy silt, organics (rootlets), trace clay, dark brown, soft, moist | 0-2 | 25.0 | 10 | | |
| | | **Sandy SILT TILL** Silty, trace medium-coarse sand, trace clay, brown, dark brown mottling, soft, moist, high plasticity | | | | | |
| | 519.27 | Trace gravel (sub-angular/sub-rounded), increased gravel with depth, trace cobbles, saturated | | | | | |
| 1 | | | 2.5-4.5 | 58.3 | 13 | | 519 |
| | | | 5-7 | 54.2 | 14 | bentonite seal | |
| 2 | | | | | | | 518 |
| | 517.59 | Silty fine sand, firm-hard, moist | 8-9.5 | 79.2 | 34 | | |
| 3 | 516.98 | Orange mottling/staining (oxidation) | 10-12 | 25.0 | >50 | | 517 |
| | 516.22 | No recovery | | 0.0 | >50 | | |
| 4 | | | | | | | 516 |
| | 515.46 | **Silty SAND TILL** Silty fine sand, some gravel (sub-rounded/sub-angular), firm-hard, moist | 15-17 | 25.0 | >50 | silica sand | |
| 5 | | | | | | 50 mm 010 slot PVC pipe | 515 |
| | | | | 4.2 | >50 | | |
| | | | | | | end cap | |

End of monitoring well at 514.09 m

Well Completion Details:
Screened interval from 515.61 m to 514.09 m
Elevation at top of pipe (TOP) = 520.85 m

Groundwater Information:
Depth to groundwater from TOP = 1.19 m (May 13, 2022)

* denotes soil sample taken for lab analysis

DRILLING METHOD: Hollow Stem Auger Drilling
BOREHOLE DIAMETER: 0.2 m (OD)
DRILL DATE: April 27, 2022
LOGGED BY: AW
DRILLED BY: Orbit Garrant

Notes: SPLIT SPOON; NO RECOVERY

SLR CONSULTING (CANADA) LTD.

CLIENT: **Dundalk Village Two Inc.**
PROJECT:
ADDRESS: **Dundalk Northeast Southgate, ON**
SLR JOB NO: **209.30125.00003**

# Monitoring Well LOG

BOREHOLE NO: MW22-314
SURFACE ELEVATION: 517.28 m

| DEPTH (m) | ELEVATION (m) | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE ID | % Recovery | SOIL TYPE | TEST DATA: ■SPT Count (10 20 30 40 50) ◆ % Moisture (20 40 60 80100) | WELL COMPLETION | WATER LEVEL | WELL COMPLETION NOTES | ELEVATION (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 517.28 | **TOPSOIL** | | | | | | | | cement | 517 |
| | 517.13 | **SAND**<br>Silty, occasional medium sand, trace gravel, brown, orange-black mottling, loose, frim, moist | | 0-2 | 70.8 | | ■4 | | | | |
| | 516.52 | **Silty SAND TILL**<br>Fine sand, some cobbles, brown-grey, loose, firm, wet | | 2.5-4.5 | 41.7 | | ■14 | | | | 516 |
| 1 | 515.76 | | | | | | | | | | |
| | 515.65 | Some silt, occasional coarse sand, trace gravel, brown/grey - orange mottling, loose, soft-firm, wet<br>Orange mottling, loose, firm, wet | | 5-7 | 41.7 | | ■6 | | | | |
| 2 | 514.99 | fine-medium sand, some gravel (angular), trace cobble, trace clay, brown-grey, dense, firm, moist-dry, increasing gravel content with depth | | 7.5-9.5 | 41.7 | | ■>50 | | | bentonite seal | 515 |
| 3 | | | | 10-12 | 41.7 | | ■39 | | | | 514 |
| 4 | | | | 12.5-14.5 | 33.3 | | ■>50 | | | | 513 |
| | 512.71 | loose, sands and gravel layer | | 15-17 | 33.3 | | ■>50 | | | | |
| 5 | | | | | | | | | | silica sand<br>50 mm 010 slot<br>PVC pipe | 512 |
| | | | | 17.5-19.5 | 66.7 | | ■>50 | | | | |
| 6 | | | | | | | | | | end cap<br>silica sand | 511 |
| | | | | 20-22 | 37.5 | | ■>50 | | | bentonite seal | |

End of monitoring well at 510.42 m

Well Completion Details:
Screened interval from 512.71 m to 511.18 m
Elevation at top of pipe (TOP) = 518.25 m

Groundwater Information:
Depth to groundwater from TOP = 1.55 m (May 13, 2022)

* denotes soil sample taken for lab analysis

DRILLING METHOD: Hollow Stem Auger Drilling
BOREHOLE DIAMETER: 0.2 m (OD)
DRILL DATE: April 20, 2022
LOGGED BY: MJ
DRILLED BY: Geo-Environmental

Notes: SPLIT SPOON

SLR CONSULTING (CANADA) LTD.

CLIENT: **Dundalk Village Two Inc.**
PROJECT:
ADDRESS: **Dundalk Northeast Southgate, ON**
SLR JOB NO: **209.30125.00003**

# Monitoring Well LOG

BOREHOLE NO: MW22-315
SURFACE ELEVATION: 518.81 m

| DEPTH (m) | ELEVATION (m) | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE ID | % Recovery | SOIL TYPE | TEST DATA: ■SPT Count (10 20 30 40 50) ◆ % Moisture (20 40 60 80 100) | WELL COMPLETION | WATER LEVEL | WELL COMPLETION NOTES | ELEVATION (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 518.81 | **TOPSOIL** | | *0-0.4 / DUP-3B | 50.0 | | 5 | | | cement | 518 |
| | 518.61 | **Sandy SILT TILL** Some clay, trace gravel, orange-black mottling, brown, firm, loose, moist | | | | | | | | | |
| 1 | 518.05 | Trace medium sand, hard, moist, increasing density and gravel content with depth | | 2.5-5 | 33.3 | | 9 | | | | 517 |
| | 517.29 | Firm, compact, moist | | 5-7.5 | 66.7 | | 15 | | | | |
| 2 | | | | 7.5-10 | 100.0 | | 48 | | | | 516 |
| 3 | | | | 10-12.5 | 41.7 | | >50 | | | | 515 |
| 4 | | | | 12.5-15 | 62.5 | | >50 | | | | 514 |
| 5 | | | | 15-17.5 | 83.3 | | 49 | | | bentonite seal | 513 |
| 6 | | | | 17.5-20 | 79.2 | | >50 | | | | 512 |
| 7 | | | | 20-22.5 | 79.2 | | 34 | | | | 511 |
| 8 | | | | 22.5-25 | 54.2 | | >50 | | | | 510 |
| 9 | | | | 25-27.5 | 37.5 | | >50 | | | | 509 |
| 10 | | | | 27.5-30 | 54.2 | | >50 | | | | 508 |
| 11 | | | | 30-32.5 | 16.7 | | >50 | | | | 507 |
| 12 | | | | 32.5-35 | 8.3 | | >50 | | | silica sand 50 mm 010 slot PVC pipe | 506 |
| | 506.41 | **SAND** Fine-medium sand, gravel (angular), light grey, firm, compact, wet | | 35-37.5 | 20.8 | | >50 | | | end cap silica sand | |
| | | | | 37.5-40 | 33.3 | | >50 | | | bentonite seal | |
| | | | | 40-42.5 | 41.7 | | >50 | | | | |

End of monitoring well at 505.86 m

Well Completion Details:
Screened interval from 508.14 m to 506.62 m
Elevation at top of pipe (TOP) = 519.73 m

Groundwater Information:
Depth to groundwater from TOP = 3.89 m (May 13, 2022)

* denotes soil sample taken for lab analysis

DRILLING METHOD: Hollow Stem Auger Drilling
BOREHOLE DIAMETER: 0.2 m (OD)
DRILL DATE: April 28, 2022
LOGGED BY: MJ
DRILLED BY: Geo-Environmental

Notes: SPLIT SPOON

SLR CONSULTING (CANADA) LTD.

CLIENT: **Dundalk Village Two Inc.**
PROJECT:
ADDRESS: **Dundalk Northeast Southgate, ON**
SLR JOB NO: **209.30125.00003**

# Monitoring Well LOG

BOREHOLE NO: MW22-316
SURFACE ELEVATION: 520.07 m

| DEPTH (m) | ELEVATION (m) | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE ID | % Recovery | SOIL TYPE | TEST DATA: SPT Count / % Moisture | WELL COMPLETION | WATER LEVEL | WELL COMPLETION NOTES | ELEVATION (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 520.07 | **TOPSOIL** | | | | | | | | | 520 |
| | 519.84 | Organics, dark brown, moist | | | | | | | | | |
| | | **Silty SAND TILL** Fine sand, silt, gravel (angular), trace clay, light brown, soft, moist | | 0-2 | 37.5 | | 6 | | | silica sand | |
| 1 | | | | *2.5-4.5 / DUP-3E | 37.5 | | 12 | | | | 519 |
| | | | | *5-7 | 33.3 | | 13 | | | | |
| 2 | 517.78 | Cobbles, light brown, dense/hard, dry | | 7.5-9.5 | 83.3 | | 35 | | | | 518 |
| 3 | | | | 10-12 | 58.3 | | >50 | | | | 517 |
| | 516.26 | **COBBLE** Cobble chips, dry | | 12.5-14.5 | 20.8 | | >50 | | | bentonite seal | |
| 4 | | | | 15-17 | | | >50 | | | | 516 |
| 5 | 514.74 | No Recovery | | | 0.0 | | | | | | 515 |
| 6 | 513.97 | **Silty SAND TILL** Fine sand, gravel (angular), light brown-grey, dense/hard, dry | | 20-22 | 45.8 | | >50 | | | | 514 |
| 7 | | | | 22.5-24.5 | 50.0 | | >50 | | | | 513 |
| | 512.45 | Wet from 7.62 to EOH | | | | | | | | | |
| 8 | | | | 25-27 | 45.8 | | >50 | | | | 512 |
| | | | | 27.5-29.5 | 37.5 | | >50 | | | silica sand 50 mm 010 slot PVC pipe | |
| 9 | | | | | | | | | | end cap | 511 |

End of monitoring well at 510.93 m

Well Completion Details:
Screened interval from 512.45 m to 510.93 m
Elevation at top of pipe (TOP) = 521.04 m

Groundwater Information:
Depth to groundwater from TOP = 2.37 m (May 13, 2022)

* denotes soil sample taken for lab analysis

DRILLING METHOD: Hollow Stem Auger Drilling
BOREHOLE DIAMETER: 0.2 m (OD)
DRILL DATE: May 4, 2022
LOGGED BY: RH
DRILLED BY: Geo-Environmental

Notes: SPLIT SPOON
NO RECOVERY



SLR BOREHOLE LOG (MOISTURE) 209.30125.00003_MG_2022.08.30.GPJ SLR_CAN V5.2 MOISTURE.GDT 11/17/22

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90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

| BARRIE | MISSISSAUGA | OSHAWA | NEWMARKET | GRAVENHURST | HAMILTON |
|---|---|---|---|---|---|
| TEL: (705) 721-7863 | TEL: (905) 542-7605 | TEL: (905) 440-2040 | TEL: (905) 853-0647 | TEL: (705) 684-4242 | TEL: (905) 777-7956 |
| FAX: (705) 721-7864 | FAX: (905) 542-2769 | FAX: (905) 725-1315 | FAX: (905) 881-8335 | FAX: (705) 684-8522 | FAX: (905) 542-2769 |


# APPENDIX B

## GRAIN SIZE DISTRIBUTION GRAPHS

## REFERENCE NO. 2210-S028C

**Soil Engineers Ltd.**

# GRAIN SIZE DISTRIBUTION

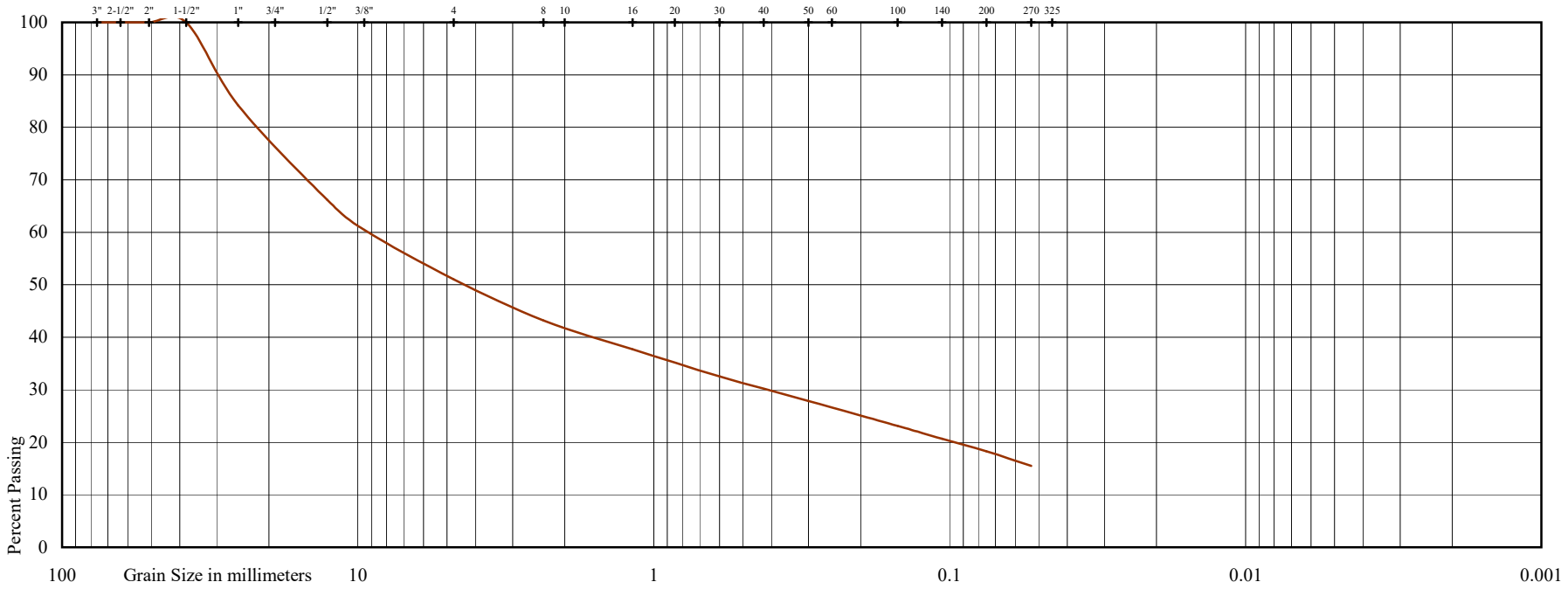
Reference No: 2210-S028C

U.S. BUREAU OF SOILS CLASSIFICATION

| GRAVEL | | SAND | | | | SILT | CLAY |
|---|---|---|---|---|---|---|---|
| COARSE | FINE | COARSE | MEDIUM | FINE | V. FINE | | |

UNIFIED SOIL CLASSIFICATION

| GRAVEL | | SAND | | | SILT & CLAY |
|---|---|---|---|---|---|
| COARSE | FINE | COARSE | MEDIUM | FINE | |




Project: Proposed Residential Development

Location: Part of Lots 225 & 226 Concession 2, Township of Southgate (Dundalk)

Borehole No: MW22 - 312

Sample No: 10 - 12

Depth (m): 3.4

Elevation (m): 517.3

Liquid Limit (%) = -

Plastic Limit (%) = -

Plasticity Index (%) = -

Moisture Content (%) = -

Estimated Permeability (cm./sec.) = $10^{-3}$

Classification of Sample [& Group Symbol]: SANDY GRAVEL some silt

Figure: 1

**Soil Engineers Ltd.**

# GRAIN SIZE DISTRIBUTION

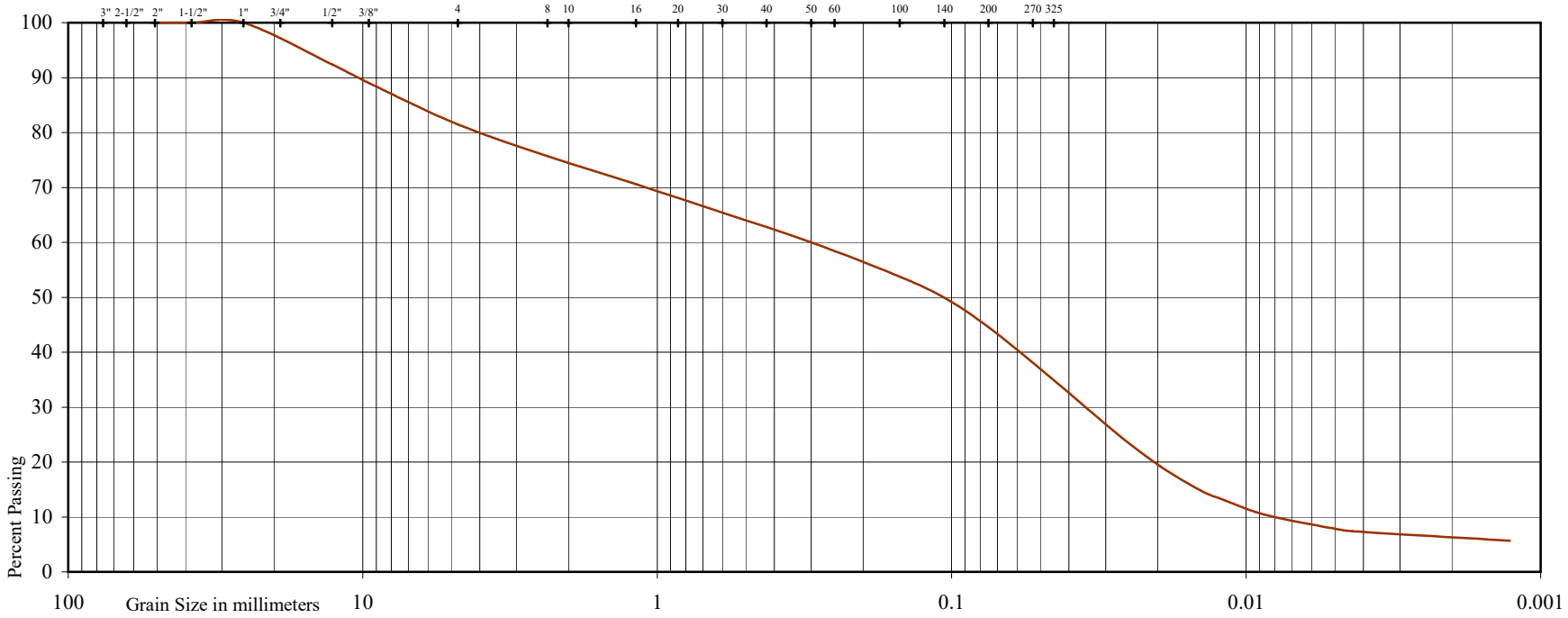
Reference No: 2210-S028C

U.S. BUREAU OF SOILS CLASSIFICATION

| GRAVEL | | SAND | | | | SILT | CLAY |
|---|---|---|---|---|---|---|---|
| COARSE | FINE | COARSE | MEDIUM | FINE | V. FINE | | |

UNIFIED SOIL CLASSIFICATION

| GRAVEL | | SAND | | | SILT & CLAY |
|---|---|---|---|---|---|
| COARSE | FINE | COARSE | MEDIUM | FINE | |




Project: Proposed Residential Development

Location: Part of Lots 225 & 226 Concession 2, Township of Southgate (Dundalk)

Borehole No: MW22 - 314

Sample No: 12.5 - 14.5

Depth (m): 4.1

Elevation (m): 513.2

Liquid Limit (%) = -

Plastic Limit (%) = -

Plasticity Index (%) = -

Moisture Content (%) = -

Estimated Permeability (cm./sec.) = $10^{-4}$

Classification of Sample [& Group Symbol]: SANDY SILT, TILL
some gravel, a trace of clay

Figure: 2

**Soil Engineers Ltd.**

# GRAIN SIZE DISTRIBUTION

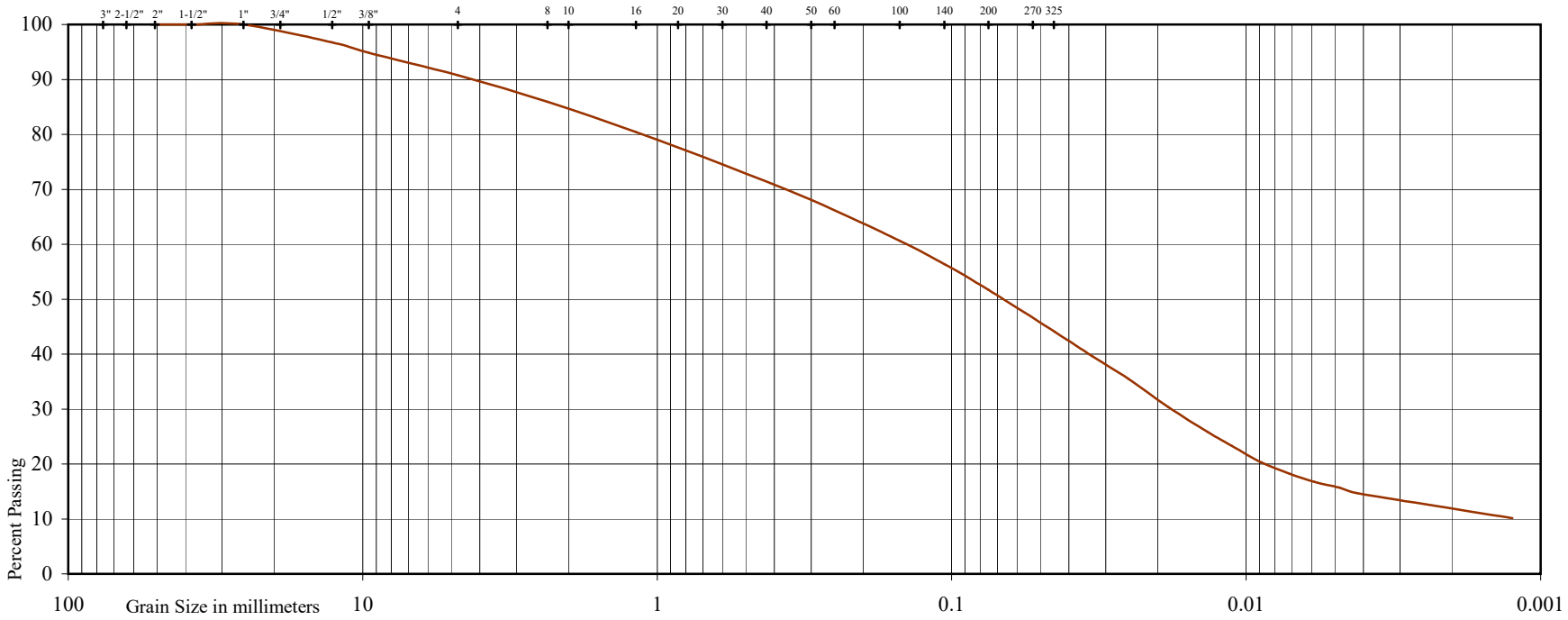
Reference No: 2210-S028C

U.S. BUREAU OF SOILS CLASSIFICATION

| GRAVEL | | SAND | | | | SILT | CLAY |
|---|---|---|---|---|---|---|---|
| COARSE | FINE | COARSE | MEDIUM | FINE | V. FINE | | |

UNIFIED SOIL CLASSIFICATION

| GRAVEL | | SAND | | | SILT & CLAY |
|---|---|---|---|---|---|
| COARSE | FINE | COARSE | MEDIUM | FINE | |




Project: Proposed Residential Development

Location: Part of Lots 225 & 226 Concession 2, Township of Southgate (Dundalk)

Borehole No: MW22 - 315

Sample No: 7.5 - 10

Depth (m): 2.7

Elevation (m): 516.1

Liquid Limit (%) = -

Plastic Limit (%) = -

Plasticity Index (%) = -

Moisture Content (%) = -

Estimated Permeability (cm./sec.) = $10^{-6}$

Classification of Sample [& Group Symbol]: SANDY SILT, TILL
some clay, a trace of gravel

Figure: 3


MW22-315

MW22-313-S/D

MW22-314

MW22-316

MW22-312

STREET A
STREET B
STREET C
STREET D
STREET E
STREET F
STREET H
STREET I
BRADLEY STREET EXTENSION
TODD CRES.
BRADLEY ST.
MACKENZIE ST.
GREY COUNTY CP RAIL TRAIL
ADJACENT LANDS OWNED BY APPLICANT
SETTLEMENT BOUNDARY
RESIDENTIAL
FUTURE RESIDENTIAL
CROPLAND
WOODED AREA
SWM AREA
LOT 227, CONCESSION 2, SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD

**LAND USE SUMMARY**

| LAND USE | LOT / BLOCK # | UNITS | AREA |
|---|---|---|---|
| SINGLE DETACHED - 10.1m LOTS | 001-369 | 369 | 13.14ha |
| SEMI DETACHED - 8.1m UNITS | 370-378 | 18 | 0.48ha |
| TOWNHOUSE - 6.5m UNITS | 379-394 | 72 | 1.66ha |
| Park | 395 | | 1.37ha |
| STORMWATER MANAGEMENT AREA | 396 | | 1.39ha |
| WALKWAY | 397-398 | | 0.09ha |
| DRAINAGE / WALKWAY | 399-401 | | 0.29ha |
| OPEN SPACE | 402-403 | | 6.94ha |
| FUTURE RIGHT OF WAY | 404-405 | | 0.50ha |
| RIGHT OF WAY | A, B, C, D, E, F, G H, I, BRADLEY STREET EXTENSION | | 7.46ha |
| TOTALS | | 459 | 33.27ha |

LEGEND

SLR Borehole/Monitoring Well

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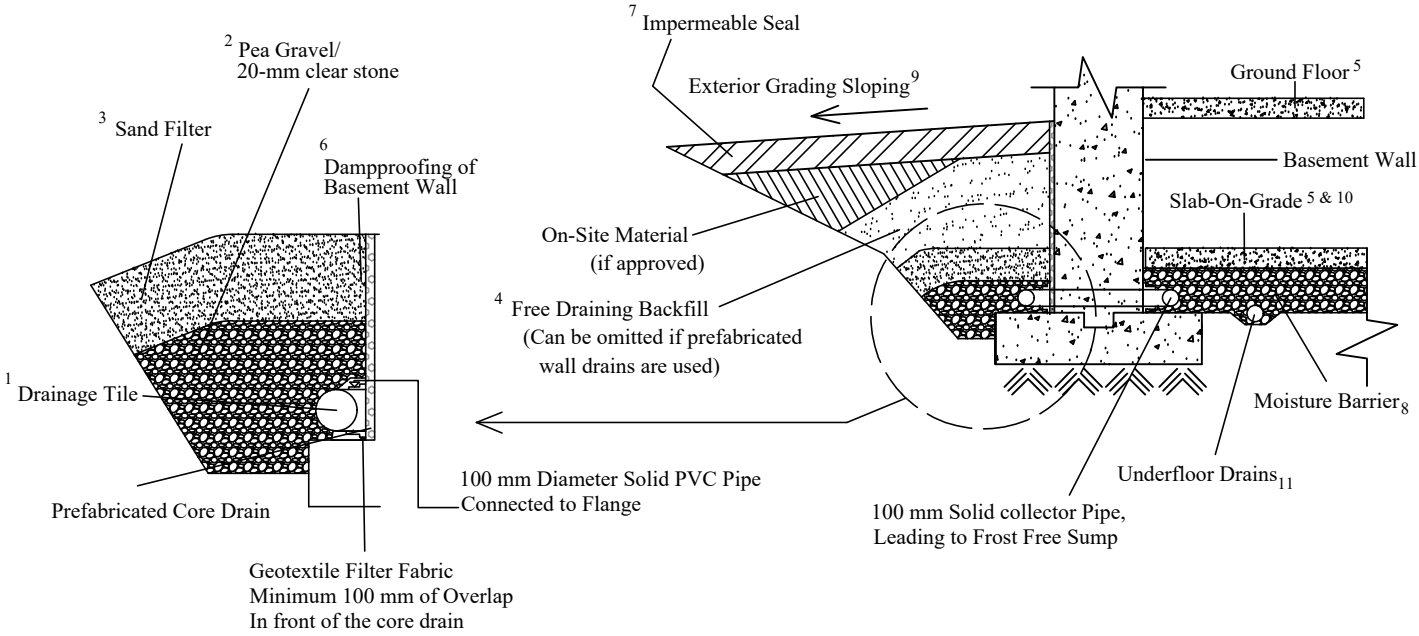
90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

# Borehole and Monitoring Well Location Plan

**SITE:** Part of Lots 225 & 226 Concession 2 Southgate, ON (Dundalk North)

| DESIGNED BY: D.K. | CHECKED BY: K.L. | DWG NO.: 1 | |
|---|---|---|---|
| SCALE: 1:4000 | REF. NO.: 2210-S028C | DATE: January 2023 | REV - |




## NOTES:

1. **Drainage tile**: consists of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet. Invert to be at minimum of 150 mm (6") below underside of basement floor slab.

2. **Pea gravel**: at 150 mm (6") on the top and sides of drain. If drain is not placed on concrete footing, provide 100 mm (4") of pea gravel below drain. The pea gravel may be replaced by 20 mm clear stone provided that the drain is covered by a porous geotextile membrane of Terrafix 270R or equivalent.

3. **Filter material**: consists of C.S.A. fine concrete aggregate. A minimum of 300 mm (12") on the top and sides of gravel. This may be replaced by an approved porous geotextile membrane of Terrafix 270R or equivalent.

4. **Free-draining backfill**: OPSS Granular 'B' or equivalent, compacted to 95% to 98% (maximum) Standard Proctor dry density. Do not compact closer than 1.8 m (6') from wall with heavy equipment. This may be replaced by on-site material if prefabricated wall drains (Miradrain) extending from the finished grade to the bottom of the basement wall are used.

5. **Do not backfill** until the wall is supported by the basement floor slab and ground floor framing, or adquate bracing.

6. **Dampproofing** of the basement wall is required before backfilling

7. **Impermeable backfill seal** of compacted clay, clayey silt or equivalent. If the original soil in the vicinity is a free-draining sand, the seal may be omitted.

8. **Moisture barrier**: 20-mm clear stone or compacted OPSS Granular 'A', or equivalent. The thickness of this layer should be 150 mm (6") minimum.

9. **Exterior Grade**: slope away from basement wall on all the sides of the building.

10. **Slab-On-Grade** should not be structurally connected to walls or foundations.

11. **Underfloor drains*** should be placed in parallel rows at 6 to 8 m (20'-25') centre, on 100 mm (4") of pea gravel with 150 mm (6") of pea gravel on top and sides. The invert should be at least 300 mm (12") below the underside of the floor slab. The drains should be connected to positive sumps or outlets. Do not connect the underfloor drains to the perimeter drains.

* Underfloor drains can be deleted where not required.

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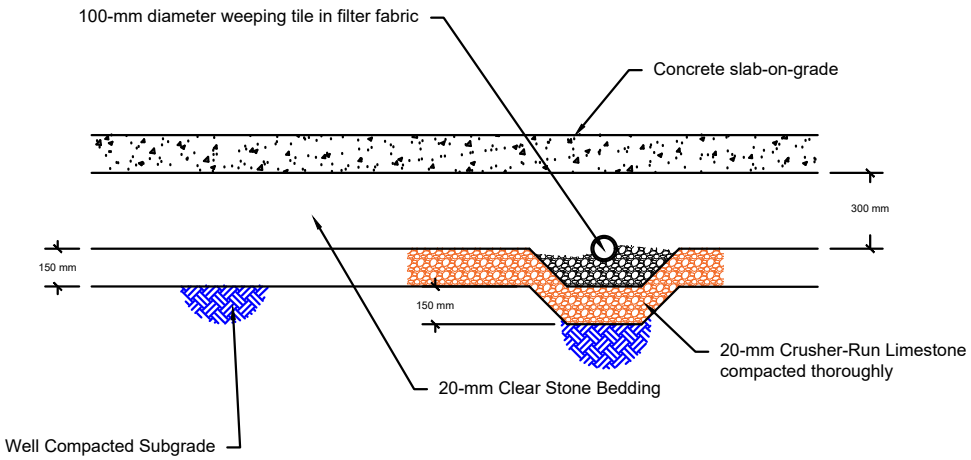
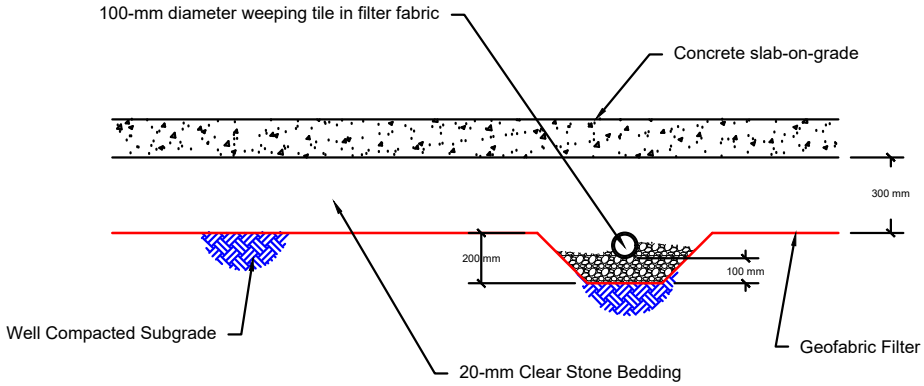
Details of Permanent Perimeter Drainage System

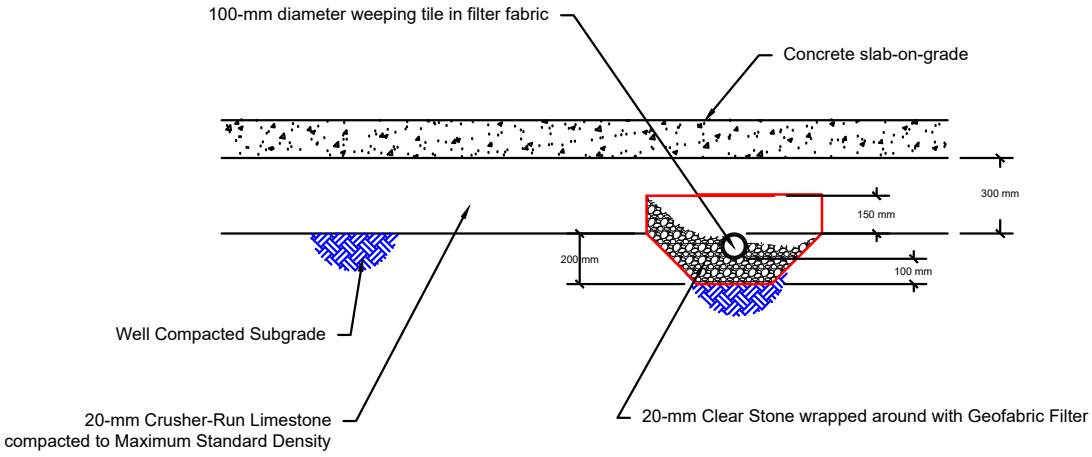
| | | | |
|---|---|---|---|
| **SITE** Part of Lots 225 & 226 Concession 2, Township of Southgate (Dundalk) | | | |
| **DESIGNED BY** K.L. | **CHECKED BY** B.S. | **DWG NO.** 2 | |
| **SCALE** N.T.S. | **REF. NO.** 2210-S028C | **DATE** January 2023 | **REV** - |




# Option 'A'




# Option 'B'




# Option 'C'

**Note:**

1. Weepers should be placed in 6 m grids, draining in a positive gradient towards an outlet or a sump pit for removal by pumping.
2. A 10-mil polyethylene sheet should be specified between the gravel bedding and concrete slab.

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100 NUGGET AVENUE, TORONTO, ONTARIO M1S 3A7 · TEL: (416) 754-8515 · FAX: (416) 754-8516

Underfloor Subdrain Details

| | | | |
|---|---|---|---|
| **SITE:** Part of Lots 225 & 226 Concession 2, Township of Southgate (Dundalk) | | | |
| **DESIGNED BY:** K.L. | **CHECKED BY:** B.L. | **DWG NO.:** 3 | |
| **SCALE:** N.T.S. | **REF. NO.:** 2210-S028C | **DATE:** January 2023 | **REV** - |

# Environmental Impact Study

## Glenelg Phase 3


**Flato Developments Inc.**

3621 Highway 7 East, Suite 503
Markham, Ontario
L3R 0G6

Prepared by:

**SLR Consulting (Canada) Ltd.**

300 Town Centre Blvd., Suite 200
Markham, Ontario
L3R 5Z6



SLR Project No:

209.30125.00003

May 24, 2023

## Revision Record

| Revision No. | Revision Date | Revision Description |
|---|---|---|
| Version 0 | September 9, 2022 | |
| Version 1 | May 17, 2023 | Draft issued for review: Address agency comments, updated site plan |
| Version 2 | May 24, 2023 | Final issued for submission |

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# 1.0 Introduction

SLR Consulting (Canada) was retained by Flato Developments Inc. (Flato) to undertake environmental investigations on two parcels of land, Lot 225 Concession 1 W and part lots 225 and 226 Concession 2 W located in Dundalk, Ontario in support of proposals for residential development within the westernmost portion of these properties ("site", Figure 1). The southeast half of the subject lands fall under the jurisdiction of the Grand River Conservation Authority (GRCA) and the northwest half is under the jurisdiction of Saugeen Conservation (SVCA).

These lands fall within a larger area currently subject to an approved Ministerial Zoning Order (MZO). The development of these subject lands will be phased.

## 1.1 Goals and Objectives

The purpose of the EIS is to demonstrate that the proposed development has regard for the policies, guidelines and regulations that apply to these lands in the Official Plans of the Township of Southgate and Grey County, the Planning Act and Provincial Policy Statement 2020 and Policies of both the Grand Region Conservation Authority (GRCA) and the Saugeen Valley Conservation Authority (SVCA). The objectives of this study include the following:

- Characterize existing conditions
- Identify significant natural heritage features, functions, and sensitivities
- Assess potential effects associated with the proposed development
- Apply mitigation strategies and techniques to minimize potential effects and show consistency with the natural heritage policy and legislative framework that applies to these lands
- Recommend whether the proposed Draft Plan of Subdivision (DPOS) can proceed with appropriate mitigation and/or compensation if required

## 1.2 Planning context

Development on the site is subject to federal, provincial, and local environmental Acts, regulations, and policies. These documents provide direction and guidance regarding proposed changes in land use and the protection of natural heritage features and functions.

The applicable natural heritage regulatory and policy framework that applies to the site includes:

- Provincial Policy Statement, 2020
- Federal Fisheries Act, 2019
- Migratory Birds Convention Act, 1994
- Endangered Species Act, 2007
- Federal Species at Risk Act, 2002
- O. Regs. 150/06 and 169/06
- GRCA Planning and Permitting Policies, including GRCA (2015) Policies for the Administration of O. Reg. 150/06
- SVCA (2017) Environmental Planning and Regulations Policies Manual

- Township of Southgate Official Plan (2022)
- Grey County Official Plan (2019)
- GRCA (2005) Environmental Impact Study Guidelines and Submission Standards for Wetlands
- Evaluation, Classification and Management of Headwater Drainage Features Guidelines (Toronto and Region Conservation Authority and Credit Valley Conservation, 2014)

A Terms of Reference (ToR) for the EIS was developed with input from the GRCA (see Appendix A).

## 1.3 Site Location and Description

The site is approximately 35 ha and located immediately east of the Grey County CP Rail Trail, west of Highway 10 and north of Todd Crescent. Natural features on and adjacent to the site include:

- Three tributaries to the Saugeen River and Grand River (headwater drainage features [HDF]) and their associated floodplains; the single on-site tributary to be assessed occurs within the jurisdiction of the Saugeen Valley Conservation Authority
- Three unevaluated wetlands.

Development is proposed on approximately 26 ha of the western portion of the site, with connections planned to a development under construction to the south and another to the Carriage House Phase 2 development currently under construction west of the Grey County Rail Trail. Please refer to Figure 1.

Low, medium, and high-density residential development is proposed east of an environmental protection area consisting of significant woodlands and unevaluated wetlands.

# 2.0 Methodology

This EIS includes a summary of the existing conditions based on a review of secondary source material and preliminary field inventories including vegetation mapping, aquatic resource investigations, targeted wildlife surveys and feature staking exercises with representatives from the GRCA (scheduled for September) and Township of Southgate. Existing conditions within the site were evaluated through a review of secondary source material and site investigations by qualified SLR Ecologists between November 2021 and August 2022. Recent aerial photographs of the site were obtained and used to assist in field verification. Data collected were integrated to review the natural environment features and functions and identify environmental constraints to the Draft Plan for Subdivision application.

## 2.1 Desktop Analysis

A secondary source review was performed to characterize the natural environment of the site and identify known natural heritage features and functions within and adjacent to the site. The information presented in Table 1 was reviewed and used to inform the need for additional field studies and avoid duplication of effort.

**Table 1: Information Source Summary and Description**

| Information Source | Data Description |
|---|---|
| Aerial Imagery | Google, MNDMNRF imagery from 1954 to 2021 |
| Ontario Geological Survey Mapping (OGS) | Physiography, topography and soil characteristics of the site |
| Grand River Conservation Authority, Map your Property Application. Accessed on-line for Ontario Regulation 150/06 policies and Watershed Development Guidelines (August 2022) https://maps.grandriver.ca/web-gis/public/?theme=MYP | Policies in accordance with Ontario Regulation 150/06 and GRCA regulation limits |
| Saugeen Valley Conservation Authority mapping tool. Accessed on-line for Ontario Regulation 169/06 policies and watershed development guidelines (August 2022) https://www.saugeenconservation.ca/en/permits-and-planning/maps-and-gis.aspx | Policies in accordance with Ontario Regulation 169/06 and SVCA regulation limits |
| Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry, Natural Heritage Information Centre (NHIC), *Element Occurrences* © Queen's Printer for Ontario, 2020, Accessed August 2022 | Evaluated and unevaluated wetlands, watercourses, woodlands, Greenlands, ANSIs, rare species occurrences, plant communities, wetlands, and natural areas information |
| Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry, Land Information Ontario (LIO), *Wetlands, ANSI, Natural Features* © Queen's Printer for Ontario, 2020, Downloaded July 2022 | Evaluated and unevaluated wetlands, ANSIs, natural feature and topography |
| Ontario Breeding Bird Atlas Online. Accessed on-line November 8, 2021 https://www.birdsontario.org/atlas/index.jsp?lang=en | General Avian species and potential Species at Risk |
| Fisheries and Oceans Canada Distribution Maps for Fish and Mussel Species at Risk (on-line accessed August 22, 2022; modified 2022-08-11 | Online mapping resource to identify potential species at risk occurrences and critical habitat |
| Ontario Species at Risk List (O. Reg. 230/08) | Species at Risk list and current status ratings |
| Southgate Township Official Plan (2022) | Environmental protection areas, Greenbelt, natural heritage system and schedules |
| Grey County Official Plan (2019) | Environmental protection areas, Greenbelt, natural heritage system and schedules. |

## 2.2 Field Studies

The following sections outline the field studies that have been completed along with what is proposed for future site characterization (see the TOR for additional studies in Appendix E).

### 2.2.1 Terrain and Surficial Geology

To complement the review of Ontario Geological Survey (OGS) mapping, SLR is also completing hydrogeological investigations in support of the proposed project. These investigations are on-going, and findings will be reported under a separate cover upon completion.

### 2.2.2 Natural Environment

Additional information with respect to fisheries, wildlife, and Species at Risk (SAR) were obtained through preliminary field reconnaissance and targeted field surveys. This information was used to develop the description of the natural environment and to identify potential impacts related to proposed land use changes. The following table (Table 2) provides a summary of site visits and field tasks completed to date.

**Table 2: Summary of Field Surveys**

| Date/Time | Task | Personnel | Weather |
|---|---|---|---|
| November 10, 2021<br>11:45-14:00 | Site Reconnaissance and preliminary vegetation inventory | Gord Wichert<br>Matthew Ross | Sky: partly cloudy; Beaufort wind: 3; Temperature: 10°C |
| April 20, 2022<br>14:15-17:20 | Headwater Drainage Feature Assessment | Diane Francis | Sky: Clear, Beaufort wind: N/A [1]; Temperature: 5°C |
| April 24, 2022<br>23:30-24:00 | Amphibian Surveys | Joelle Pecora<br>Megan Olson | Sky: Cloudy, Beaufort wind: 1; Temperature: 13°C |
| April 25, 2022<br>13:45-14:05 | Headwater Drainage Feature Assessment | Diane Francis | Sky: Rain, Beaufort Wind: 2-3; Temperature: 13°C |
| May 2, 2022<br>21:30-21:33 | Amphibian Surveys | Diane Francis<br>Megan Olson | Sky: Cloudy, Beaufort Wind: 2; Temperature: 9°C |
| May 17, 2022<br>3 hrs | Vegetation Survey | Kim Laframboise<br>Fiona Shi | Sky: Clear, Beaufort Wind: 0; Temperature: 13° |
| May 25, 2022<br>9:00-13:35 | Headwater Drainage Feature Assessment | Diane Francis | Sky: Cloudy, Beaufort Wind: 3-5; Temperature: 13°C |
| May 30, 2022<br>21:35-21:38 | Amphibian Surveys | Danielle Bourque<br>Fiona Shi | Sky: Partly cloudy, Beaufort Wind: 1; Temperature: 25°C |
| June 1, 2022<br>22:57-23:01 | Amphibian Surveys | Joelle Pecora<br>Fiona Shi | Sky: Clear; Beaufort Wind: 2; Air temperature 12°C; |

| Date/Time | Task | Personnel | Weather |
|---|---|---|---|
| June 14, 2022<br>~6:00-10:00 | Breeding Bird Surveys | Jeremy Bensette | N/A |
| June 28, 2022<br>11:15-11:18 | Amphibian Surveys | Ed Poropat<br>Jeremy Bensette | Sky: Partly cloudy; Beaufort Wind: 2; Air Temperature 20°C; |
| June 30, 2022<br>~6:00-10:00 | Breeding Bird Surveys | Jeremy Bensette | N/A |
| August 9, 2022<br>10:28-17:05 | Headwater Drainage Feature Assessment | Danielle Bourque | Sky: Rain, Beaufort Wind: 1; Temperature: N/A |
| August 10, 2022 | Natural Feature Boundary Pre-staking and Ecological Land Classification | Joelle Pecora<br>Megan Olson | Sky: partly cloudy, Beaufort Wind: 3; Temperature: 25°C |
| August 11, 2022<br>12:30-13:30 | Natural Feature Boundary Pre-staking and Ecological Land Classification | Matthew Ross<br>Fiona Shi | Sky: partly cloudy, Beaufort Wind: 3; Temperature: 25°C |
| September 21, 2022<br>9:30-4:30 | Natural Feature Boundary Verification with GRCA | Joelle Pecora<br>Fiona Shi | Sky: partly cloudy, Beaufort Wind: 4; Temperature: 28°C |
| [1]The Beaufort Wind Scale is a tool used to estimate wind conditions. [0] Air calm, smoke rises vertically [1] Light air movement, smoke drifts, [2] Wind felt on face, leaves rustle [3] Leaves and small twigs in continual motion, wind extends light flags [4] Wind raises dust, loose paper, moves small branches [5] Small trees begin to sway, white crested wavelets form on inland waters [6] Large branches in motion | | | |

#### 2.2.2.1 Fish and Aquatic Habitat

The objective of field investigations was to identify, map, and describe the existing aquatic habitat present on the subject lands.

A review of current and historical aerial imagery of the subject lands identified the potential presence of Headwater Drainage Features (HDF). Drainage features have undergone evaluation in April, May, and August 2022 using the Rapid Method provided in the Evaluation, Classification and Management of Headwater Drainage Features Guideline (TRCA and CVC, 2014). This approach is appropriate for low sensitivity sites and documents the HDF form and flow conditions, riparian vegetation and site features that are important components of habitat. Recommended management options for drainage features derive from information collected according to the HDF guidelines.

#### 2.2.2.2 Vegetation Communities

Aerial photography, and Land Information Ontario data were used to delineate vegetation communities according to principles of the Ecological Land Classification (ELC) for Southern Ontario: First

Approximation and its Application (Lee et. al., 1998). Preliminary site investigations were undertaken in November 2021 with confirmatory mapping completed throughout 2022 to collect vegetation data at the community level. A split-spoon soil auger was used to sample soil profiles to determine at what point they exhibit hydric properties, i.e., sufficiently saturated to support greater than 50% wetland species. Wetlands on and adjacent to site that may be subject to potential impacts from the proposed development will be assessed using the guidance of the Ontario Wetland Evaluation System.

#### 2.2.2.3 Feature Staking

The pre-staking of features to delineate the boundaries of wetland features and tree dripline of woodland features within the Study Area was undertaken on August 9, 10 and 11, 2022. Feature Staking verification with GRCA occurred on September 21, 2022. A survey of the verified boundaries will be undertaken in 2023 as a condition of draft plan approval. The wetland boundary was determined where wetland vegetation dominates the community and the soils exhibit characteristics of at least seasonal saturation as per the definition of wetland in the PPS, 2020.

#### 2.2.2.4 Tree Inventory

An inventory of trees that could be injured or destroyed by the proposed DPOS is planned to assess trees that may be impacted. Trees not protected by a buffer but within 6 m of the property boundary will be included. An arborist report and Tree Inventory and Protection Plan (TIPP) will be prepared under separate cover.

#### 2.2.2.5 Breeding Bird Surveys

The Ontario Breeding Bird Atlas (OBBA) (BSC 2006) was reviewed to compile a master list of potential birds breeding at the site, which was subsequently analyzed against known available suitable supporting habitat to tailor findings specifically to the existing site conditions.

Breeding bird surveys were undertaken within the recognized surveying window in Ontario for breeding birds (typically June and early July) on June 14 and 30, 2022. Surveys followed standard methodologies and conditions established by the OBBA (BSC 2001) (i.e., between 05:30 and 10:00, low winds, no precipitation, and suitable temperatures). Breeding evidence was recorded and classified as possible, probable, or confirmed (e.g., singing male, pair observed or adult carrying food) in accordance with the standard protocols. Where SAR birds were observed, information including sex, behaviour and interaction with other SAR and non-SAR birds were also recorded.

#### 2.2.2.6 Reptile and Amphibian Surveys

Secondary source literature was reviewed to identify known records of reptiles, amphibians, or both, potentially found within the site, including the NHIC database. Amphibian surveys were undertaken to understand the potential presence of breeding amphibians and presence of SAR (e.g., Western Chorus Frog (*Pseudacris triseriata*)). Targeted surveys for reptiles were not undertaken by SLR as no preliminary triggers were identified.

Calling surveys were undertaken on April 24, May 2 and 30, June 1 and 28, 2022 and followed the general methodology of the Marsh Monitoring Program (MMP) (adapted to site conditions), during appropriate seasons and weather conditions. Established methods sponsored by Environment and Climate Change Canada (2017) for detecting Western Chorus Frog were also used. These methods involved daytime surveys where calls of the Western Chorus Frog are more detectable and not drowned out by the loud calls of the Spring Peeper (*Pseudacris crucifer*) which typically call at night.

Survey times were coordinated with several other ecologists throughout Southern Ontario via email circulation to assist surveyors in targeting the prime breeding window for early and late breeders targeting Western Chorus Frog (*Pseudacris triseriata*). As climate change has the potential to shift the incidence of calling amphibians, it is increasingly important to coordinate surveys based on weather conditions and seasonal trends. The Beaufort Wind Scale was used to determine whether wind levels were too strong to hear an accurate representation of amphibians occupying the site. A reference site was used to ensure calling was conducted during appropriate weather conditions and served as a benchmark for amphibian activity (i.e. increase confidence in negative results if calls are not detected at test sites). Calling evidence was recorded on a scale of L0-L3 and interpreted as follows:

- L0 – No calling
- L1 – Individuals can be accurately counted; calls do not overlap
- L2 – Some calls simultaneous, number of individuals can be estimated
- L3 – Full chorus, calls overlap, individuals cannot be estimated

#### 2.2.2.7 Incidental Wildlife

All incidental observations were recorded while ecologists were onsite. Evidence of presence was recorded during various field investigations from direct sightings and indirectly from such indicators as calls, nests, tracks, scats, browse and burrows.

#### 2.2.2.8 Species of Conservation Concern

Aquatic and terrestrial species that are designated federally or provincially and are of regional or local interest (e.g. rare to the watershed or municipality) are collectively identified as Species of Conservation Concern. This category also includes species protected under the ESA, 2007. The Natural Heritage Information Centre (NHIC) (on-line accessed November 2021) and the Fisheries and Oceans Canada Distribution Maps for Fish and Mussel Species at Risk (on-line accessed November 2021) were consulted for element occurrences. A habitat-based approach was used to evaluate the potential for Species of Conservation Concern to occur within the site.

With the recent addition of several bat species to the ESA list, a cursory review of site conditions was completed to determine potential habitat. This review was scoped to provide information on possible use and presence within the general context of the site.

#### 2.2.2.9 Significant Wildlife Habitat

Using the criteria outlined in the Significant Wildlife Habitat (SWH) Technical Guide and Ecoregion Criterion Schedules 6E (Ministry of Natural Resources and Forestry 2015), SWH was evaluated as part of the field investigations to evaluate the potential to occur on or adjacent to the site. Under the SWH Criteria, constructed habitat is not to be considered as SWH.

#### 2.2.2.10 Wetland Assessment and Evaluation

An assessment of the wetlands on and adjacent to the site shall be undertaken following the guidance of the Ontario Wetland Evaluation System. This will include the gathering of data on the habitat types, species of flora and fauna present within the features. Data collected will be incorporated with the results of a hydrologic study to provide a detailed assessment of the sensitivity of the wetlands.

# 3.0 Existing Conditions

The subject properties are characterized by a predominately agricultural landscape containing cultivated lands, with woodland, wetland, and hedgerow features. Three watercourses (HDFs) occur within the boundaries of the subject parcels, while one is present within the Study Area of the proposed DPOS (Figure 1). The following sections describe geological, aquatic, and terrestrial site characteristics.

## 3.1 Terrain and Surficial Geology

Based on a review of surficial geology maps from the Ontario Geological Survey (OGS), the overburden of the area is composed of the Elma Till which consists of sandy silt to silt deposits that are imperfectly drained.

The underlying bedrock is of the Guelph Formation which consists of Silurian fine to medium crystalline, medium to thick-bedded, porous dolostone of a thickness ranging from 4 to 100 m. The Guelph formation is mainly located in the subsurface of southwestern Ontario but is exposed south and west of the Niagara Escarpment from the Niagara River through the Bruce Peninsula (Jagger Hims Limited and Rowell, 2009). SLR is completing hydrogeological investigations in support of the proposed project, under a separate cover.

## 3.2 Fish and Aquatic Habitat

Agricultural lands predominate on the subject properties. Three drainage features occur within the vicinity of the study area identified as permanent features by Land Information Ontario; site observations show that the features flow intermittently. Data supporting the Headwater Drainage Feature evaluation were completed in the spring and summer of 2022.

Observations made in April, May, and August 2022 to characterize potential headwater drainage feature associated with the proposed DPOS are summarized in Table 3. Surface water was observed at the feature during the April visit, while the feature was dry during subsequent visits. Standing water was present in the feature off site to the north during April and May visits and was dry in August. Based on these observations the assessment of the headwater drainage feature on the site of the proposed DPOS was classified as No Management Required, while the segment occurring immediately off site to the north was classified as Protection (Figure 3) according to the Headwater Features Guidelines (CVC and TRCA 2014). Management can range from replication of functions through enhanced lot level conveyance measures such as vegetated swales, to mimic online wet vegetation pockets, to constructed wetlands connected to downstream features as appropriate.

**Table 3: Headwater Drainage Feature Observations**

| Drainage Feature Segment | Hydrology | Hydrology Modifiers | Riparian | Fish Habitat | Terrestrial Habitat | HDF Management Recommendations | Photos |
|---|---|---|---|---|---|---|---|
| 1 | Limited or recharge<br>April: Standing Water<br>May: Dry<br>August: Dry | Swale (tilled through) | Limited Function<br>Cropped land | Contributing function<br>allochthonous transport | Limited Function<br>Cropped land | No Management Required |  |
| 2 | Limited or recharge<br>April: Standing Water<br>May: Dry<br>August: Dry | Swale (tilled through) | Limited Function<br>Cropped land | Contributing function<br>allochthonous transport | Limited Function<br>Cropped land | No Management Required |  |
| 3 | Limited or recharge<br>April: Standing Water<br>May: Dry<br>August: Dry | Swale (tilled through) | Limited Function<br>Cropped land | Contributing function<br>allochthonous transport | Limited Function<br>Cropped land | No Management Required |  |

| Drainage Feature Segment | Hydrology | Hydrology Modifiers | Riparian | Fish Habitat | Terrestrial Habitat | HDF Management Recommendations | Photos |
|---|---|---|---|---|---|---|---|
| 4 | Limited or recharge<br>April: Standing Water<br>May: Dry<br>August: Dry | Swale (tilled through) | Limited Function<br>Cropped land | Contributing function<br>allochthonous transport | Limited Function<br>Cropped land | No Management Required |  |
| 5 | Limited or recharge<br>April: Standing Water<br>May: Dry<br>August: Dry | Swale (tilled through) | Limited Function<br>Cropped land | Contributing function<br>allochthonous transport | Limited Function<br>Cropped land | No Management Required |  |
| 6 | Limited or recharge<br>April: Standing Water<br>May: Dry<br>August: Dry | Swale (tilled through) | Limited Function<br>Cropped land | Contributing function<br>allochthonous transport | Limited Function<br>Cropped land | No Management Required |  |

| Drainage Feature Segment | Hydrology | Hydrology Modifiers | Riparian | Fish Habitat | Terrestrial Habitat | HDF Management Recommendations | Photos |
|---|---|---|---|---|---|---|---|
| 7 | Limited or recharge<br>April: Standing Water<br>May: Dry<br>August: Dry | No defined channel | Limited Function<br>Cropped land | Contributing function<br>allochthonous transport | Limited Function<br>Cropped land | No Management Required |  |
| 8 | Limited or recharge<br>April: Standing water<br>May: Damp ground<br>August: Dry | No defined channel | Limited Function<br>Cropped land | Contributing function<br>allochthonous transport | Limited Function<br>Cropped land | No Management Required |  |
| 9 | Valued or Contributing<br>April: Standing water<br>May: Standing water<br>August: Dry | No defined channel, tile drain outlet | Important function<br>Riparian wetland | Contributing function<br>allochthonous transport | Important Function<br>Wetland with breeding amphibians | Protection |  |

## 3.3 Vegetation Communities

Preliminary mapping of the vegetation communities is provided on (Figure 4) classified using Ecological Land Classification (ELC) (Lee et al., 1998). Each unit is named according to the soil and plant attributes and a code is assigned (e.g. Cultural Woodland, CUW). Wetland is delineated by the survey limit staked in the field as determined by the dominance of wetland vegetation and hydric soils. The site is largely agricultural, and wetland and woodland forest communities separate the eastern and western portions. Wetland communities contiguous with those on the site extend north and south of the site. Wetland associated with a watercourse on site occurs in the eastern portion of the site, immediately southwest of Highway 10 along with a farmhouse and associated outbuildings and landscape trees. Deciduous hedgerows occur along some field and site boundaries A botanical inventory is provided in Appendix B.

In addition to the agricultural fields, farm, and residence, the communities dominated by natural vegetation on and immediately surrounding the Study Area include:

- Dry-Fresh Sugar Maple-Beech Deciduous Forest (FOD5-2)
- White Cedar – Hardwood Mineral Mixed Swamp (SWM1-1)
- Red Maple Mineral Deciduous Swamp with Reed Canary Grass Mineral Meadow Marsh inclusion (SWD3-1/MAM2-2)
- Mineral Shallow Marsh Ecosite (MAS2)
- White Cedar Mineral Coniferous Swamp (SWC1-1)
- Reed Canary Grass Mineral Meadow Marsh with Willow Mineral Thicket Swamp inclusion (MAM2-2/SWT2-2)
- Willow Mineral Thicket Swamp (SWT2-2)
- Cultural Meadow (CUM1-1)
- Hedgerow (HR)

### 3.3.1 Dry-Fresh Sugar Maple-Beech Deciduous Forest (FOD5-2)

This community abuts the eastern side of the wetland communities in the center of the site. Species include Sugar Maple (*Acer saccharum*), American Beech (*Fagus grandifolia*), White Ash (*Fraxinus americana*), Choke Cherry (*Prunus virginiana*), with some White Birch (*Betula papyrifera*), Eastern White Cedar (*Thuja occidentalis*) and Balsam Fir (*Abies balsamea*).

### 3.3.2 White Cedar – Hardwood Mineral Mixed Swamp (SWM1-1)

This swamp community is situated at the center of the site, bisecting the eastern and western portions of agricultural land. Limits were verified with the GRCA. The canopy layer consists of Eastern White Cedar, (Green Ash (*Fraxinus pennsylvanica*), Balsam Poplar (*Populus balsamifera*), American Elm (*Ulmus americana*), White Birch, Balsam Fir, and Black Cherry (*Prunus serotina*), with Balsam Poplar, Green Ash, American Elm, and Black ash in the sub canopy. Ground cover includes Sensitive Fern (*Onoclea sensibilis*), Spinulose Wood Fern (*Dryopteris carthusiana*), Greater Bladder Sedge (*Carex intumescens*), Common Lady Fern (*Athyrium filix-femina*), Ostrich Fern (*Matteuccia struthiopteris*) and Bittersweet Nightshade (*Solanum dulcamara*).

### 3.3.3 Red Maple Mineral Deciduous Swamp with Reed Canary Grass Mineral Meadow Marsh inclusion (SWD3-1/MAM2-2)

This community is in the center of the site near the southern edge of the property boundary. The canopy layer is comprised primarily of Red Maple (*Acer rubrum*), with White Birch and Trembling Aspen, and some Eastern White cedar in the sub canopy. The shrub layer contains Reed Canary Grass, Red-osier Dogwood, Spotted Joe Pye Weed and Woolgrass (*Scirpus cyperinus*), while ground cover consists of Sensitive Fern, Spotted Jewelweed, with some Fox Sedge (*Carex vulpinoidea*) and Retrorse Sedge (*Carex retrorsa*). A small inclusion of Reed Canary Grass Meadow Marsh is present at the northeast of this community. The limits of this wetland were verified with the GRCA.

### 3.3.4 Mineral Shallow Marsh (MAS2)

This wetland community type occurs over large areas in and adjacent to the north end of the site. The predominate species present are Broad-leaved Cattail (*Typha latifolia*), Reed Canary Grass (), with scattered occurrences of Eastern White Cedar, American Elm, Tamarack, White Birch, Pussy Willow (*Salix discolor*), Bebb's Willow (*Salix bebbiana*). The largest of this community type, at the northernmost end of the site, contains inclusions of White Cedar Mineral Coniferous Swamp (SWC1-1).

### 3.3.5 White Cedar Mineral Coniferous Swamp (SWC1-1)

This community occurs adjacent to, as well as an inclusion within the large shallow marsh communities in the north end of the site. The limits were verified with the GRCA. The canopy is dominated by Eastern White Cedar, with some Balsam Fir (*Abies balsamea*), Tamarack, Balsam Poplar, and White Birch. Ground cover is minimal and includes mosses and forbs.

### 3.3.6 Reed Canary Grass Mineral Meadow Marsh with Willow Mineral Thicket Swamp inclusion (MAM2-2/SWT2-2)

This community occurs in in the eastern portion of the site, in association with the easternmost watercourse feature and the other to the west of this feature. The GRCA verified the boundaries of this feature. The species present include Reed Canary Grass, Spotted Joe Pye Weed, Broad-leaved Cattail, Field Horsetail (*Equisetum arvense*), Dark-green Bulrush (*Scirpus atrovirens*), Purple Loosestrife (*Lythrum salicaria*), Panicled Aster (*Symphyotrichum lanceolatum*), and Swamp Aster (*Symphyotrichum puniceum*). Inclusions of thicket swamp consisting of Pussy Willow and Bebb's Willow are present within these communities.

### 3.3.7 Willow Mineral Thicket Swamp (SWT2-2)

This community is located in the eastern portion of the site, east of the FOD5-2 community. The predominate species here are Pussy Willow and Bebb's Willow. The GRCA verified the feature limits.

### 3.3.8 Cultural Meadow (CUM1-1)

This community type occurs at several locations on the subject lands, primarily in the upland areas situated adjacent to meadow marsh wetlands in the eastern half of the site. The species present are typical of this community type and include Tall Goldenrod (*Solidago altissima*), Reed Canary Grass, Wild Carrot (*Daucus carota*), Tall Meadow Rue (*Thalictrum pubescens*), Stinging Nettle (*Urtica dioica*), Oxeye Daisy (*Leucanthemum vulgare*), Colts-foot (*Tussilago farfara*), and Common Dandelion (*Taraxacum officinale*).

### 3.3.9 Deciduous Hedgerow (HR-D)

These features are generally present at the borders of agricultural fields or along field access laneways and are comprised of a mix of deciduous and coniferous species including...

## 3.4 Tree inventory

A tree inventory is planned to assess trees that may be impacted by the proposed DPOS. An arborist report and Tree Inventory and Protection Plan (TIPP) will be prepared under separate cover at a later stage of the application process.

## 3.5 Breeding Birds

A review of the OBBA map square 17NJ49 yielded 93 results of birds potentially breeding in the area: the map squares measure 10 km by 10 km, with many of the results unlikely to be present within the site due to a lack of suitable supporting habitat. Review of the NHIC online database yielded potential occurrences for seven provincially rare species:

- Eastern Meadowlark (*Sturnella magna*) (Threatened)
- Bobolink (*Dolichonyx oryzivorus*)(Threatened)
- Bank Swallow (*Riparia riparia*) (Special Concern)
- Barn Swallow (*Hirundo rustica*) (Special Concern)
- Eastern Wood-pewee (*Contopus virens*) (Special Concern)
- Grasshopper Sparrow (*Ammodramus savannarum*) (Special Concern)
- Canada Warbler (*Cardellina canadensis*) (Special Concern)

Two breeding bird surveys were completed by SLR on June 14 and 30, 2022, within the designated window (Figure 5). The inventory of wildlife observed on the site is provided in Appendix C. Most of the species recorded are rural/urban tolerant species, typical of cultural and agricultural landscapes and will breed in a variety of disturbed habitats. Observed species include Song Sparrow (*Melospiza melodia*), Red-winged Blackbird (*Agelaius phoeniceus*), and American Robin (*Turdus migratorius*).

Eastern Wood-pewee were observed exhibiting probable breeding evidence within the Mixed Swamp and Sugar Maple-Beech Deciduous Forest communities.

Barn Swallow fledglings were observed near the barn in the northeast portion of the site. A used Barn Swallow nest was also found in the barn, indicating that the species was breeding here, however, it could not be confirmed that the fledglings seen were hatched in the nest observed. This species is known to use old buildings to support nesting behaviour, whereas foraging habitat is typically associated with meadows, marshes, and open spaces. Barn Swallow are provincially designated as Special Concern. Although it is not subject to provisions under the ESA, its habitat is protected as SWH under the PPS, 2020.

## 3.6 Reptiles and Amphibians

Review of the NHIC online database yielded records of two species of concern: Midland Painted Turtle (*Chrysemys picta marginata*) and Snapping Turtle (*Chelydra serpentina*).

Suitable habitat for amphibians is present on the subject lands, within wooded wetlands and marsh communities.

Amphibian surveys were conducted April 24, May 2 and 30, June 1 and 28, 2022 at strategic locations on the site to provide suitable coverage for detection of calling individuals (Figure 5). SLR conducted separate surveys to capture potential Western Chorus Frog populations as well as a generalized survey to capture all amphibians active during the early and late spring timing windows.

Western Chorus Frog surveys completed detected the presence of populations within or around the property, particularly in association with the large wetland complex that bisects the site and occurs both to the north and south of the site. Species detected during surveys included Spring Peeper (*Pseudacris crucifer*), American Toad (*Anaxyrus americanus*), Gray Tree Frog (*Dryophytes versicolor*) and Green Frog (*Lithobates clamitans*), among others presented in Table 4.

Amphibian observations were also made incidentally and included numerous (19) Green Frogs as well as Western Chorus Frogs associated with the large wetlands situated in the center of the site.

**Table 4: 2021 Amphibian Survey Results**

| Common Name | Call Level | | |
|---|---|---|---|
| Survey Date | April 2021 | May 2021 | June 2021 |
| Spring Peeper | 3 | - | - |
| American Toad | 3 | - | - |
| Gray Tree Frog | - | 2 | - |
| Green Frog | - | - | 1 |
| Wood Frog | 3 | - | - |
| Northern Leopard Frog | 2 | - | - |
| Western Chorus Frog | 2 | - | - |

## 3.7 Other Wildlife

Wildlife observed on site by SLR during the 2020 and 2021 field visits were typical of locations in semi-urban environments and agricultural settings (Appendix C). Evidence of Coyote (*Canis latrans*) and White-tailed Deer (*Odocoileus virginianus*) was observed within the site. At least three Muskrat (*Ondatra zibethicus*) push-ups were observed within the wetland immediately south of Highway 10 associated with the watercourse (HDF).

Evidence of chimney crayfish (i.e., burrows) were observed at several low-lying areas of the site, including at the edges of wetlands and the agricultural fields.

Other species of mammals and birds tolerant of urban environments are expected to occur as suitable habitats are present.

## 3.8 Species of Conservation Concern and Significant Wildlife Habitat

The MNRF website provided the following Element Occurrence (EO) records* for 1km Squares (17NJ4792, 17NJ4892) in the vicinity of the site:

- Eastern Meadowlark (*Sturnella magna*) provincially designated as Threatened
- Snapping Turtle (*Chelydra serpentina*) provincially designated as Special Concern

Department of Fisheries and Oceans' (DFO) interactive Aquatic Habitat Mapping did not identify the presence of Species at Risk or Critical Habitat within or adjacent to the site.

While no additional element occurrences were recorded for the broad area search there are Species of Conservation Concern that may occur if suitable habitat is present. The species in Table 5 have been identified as having potential habitat affinities within the site.

*Note: Species at Risk Information is accurate and up to date as of this report (May 2023). New species designations under Ontario Regulation 230/08 (Species at Risk in Ontario List) occur periodically. The owner is responsible to ensure that species and habitats regulated under Endangered Species Act (2007) or those described under other policies (i.e. the Migratory Bird Convention Act, Fish and Wildlife Conservation Act) are protected.

**Table 5: Species of Conservation Concern Screening Results**

| Common Name[1] | Scientific Name | Designation | Potential for Habitat Affinities to Occur within or Adjacent to the site |
|---|---|---|---|
| *Mammals* | | | |
| [1] Tri-colored Bat | *Perimyotis subflavus* | Endangered | Yes, suitable habitat in large, open canopied trees exhibiting decay.<br><br>Potential roosting and foraging (woodland features / hedgerows, trees generally). |
| [1] Little Brown Myotis | *Myotis lucifugus* | Endangered | Yes, suitable habitat in large, open canopied trees exhibiting decay.<br><br>Potential roosting and foraging (anthropogenic features, woodland features / hedgerows, trees generally). |
| [1] Northern Myotis | *Myotis septentrionalis* | Endangered | Yes, suitable habitat in large, open canopied trees exhibiting decay.<br>Potential roosting and foraging (woodland features). |
| *Avifauna* | | | |

| Common Name[1] | Scientific Name | Designation | Potential for Habitat Affinities to Occur within or Adjacent to the site |
|---|---|---|---|
| [1] Canada Warbler | *Cardellina canadensis* | Special Concern | Potential habitat in wooded wetland on and adjacent to the site.<br><br>Species not observed on site. |
| [1] Eastern Wood-pewee | *Contopus virens* | Special Concern | Yes, suitable habitat present in woodland features.<br><br>Species observed in deciduous forest and mixed swamp on site |
| [1] Bobolink | *Dolichonyx oryzivorus* | Threatened | Unlikely to breed on site as fields are under cultivation and existing meadow habitat is too small.<br>Species not observed on site |
| [1, 2] Eastern Meadowlark | *Sturnella magna* | Threatened | Unlikely to breed on site as fields are under cultivation and existing meadow habitat is too small.<br>Species not observed on site |
| [1] Barn Swallow | *Hirundo rustica* | Special Concern | Suitable foraging habitat on site.<br><br>Anthropogenic structures (nesting) also located on the site.<br>Species confirmed nesting on site. |
| [1] Grasshopper Sparrow | *Ammodramus savannarum* | Special Concern | Unlikely to breed on site as fields are under cultivation and existing meadow habitat is too small.<br>Species not observed on site |
| *Herptofauna* | | | |
| [1, 2] Snapping Turtle | *Chelydra serpentina* | Special Concern | Wetlands on and adjacent to the site provide potential habitat and movement corridors.<br><br>Species not observed on site |

| Common Name[1] | Scientific Name | Designation | Potential for Habitat Affinities to Occur within or Adjacent to the site |
|---|---|---|---|
| [1] Midland Painted Turtle | *Chrysemys picta marginata* | *Designated in 2018 by COSEWIC, not legally listed Provincially | Wetlands on and adjacent to the site provide potential habitat and movement corridors.<br><br>Species not observed on site |
| *Vegetation* | | | |
| [1] Butternut | *Juglans cinerea* | Endangered | Potential habitat present in wooded features, hedgerows<br><br>Species not observed on site. |
| *Other* | | | |
| [1] Rusty-patched Bumble Bee (*Bombus affinis*)<br>[1] Gypsy Cuckoo Bumble Bee *(Bombus bohemicus*)<br>[1] Nine-spotted Lady Beetle (*Coccinella novemnotata*)<br>[1] Transverse Lady Beetle (*Coccinella transversoguttata*) | | Endangered | Possible however degree of habitat alteration and ploughing makes occurrence unlikely.<br><br>Habitat generalists. Often overlooked. A range of habitats (meadow successional fields, forests, riparian areas, parks) |
| [1] Yellow-banded Bumble Bee (*Bombus terricola*) | | Special Concern | |
| [1] Monarch | *Danaus plexippus* | Special Concern | Habitat present – meadows suitable for foraging<br>Species not observed on site. |

Source: (1) MNRF, SARO List, SLR expertise; (2) NHIC (2022)
Designation Status
Provincial Status - Species at Risk in Ontario list maintained by the Ontario Ministry of Natural Resources and Forestry, O.Reg. 230/08. Endangered Species Act Regulation OMNR S.O. 2007, Chapter 6. Schedules 1 thru 5.4. O. Reg. 242/08.
Regional or Local

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC). S3 [Vulnerable] Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

## 3.9 Significant Wildlife Habitat

The significance of an area as wildlife habitat is often difficult to determine at the site-specific level, as the assessment must incorporate information from a wide geographic area and consider other factors such as

regional resource patterns and landscape effects. Therefore, under the PPS, the planning authorities have the responsibility to identify and designate Significant Wildlife Habitat (SWH). Wildlife habitat significance includes:

- Seasonal concentration areas (e.g. conifer forests for deer wintering)
- Rare vegetation communities or specialized habitats for wildlife
- Habitats of species of conservation interest, excluding the habitats of endangered and threatened species which are protected under the 2020 PPS and 2007 ESA
- Animal movement corridors

The Township of Southgate does not identify SWH within their Official Plan Schedules although it is within their responsibility under the PPS, 2020 to do so. To address this habitat function, criteria for evaluating significant wildlife habitat for Eco-region 6E have been provided by MNRF (2015). An assessment of SWH is provided in Appendix D. Field investigations completed to date identified confirmed habitat for:

- Special Concern and Rare Wildlife Species for Eastern Wood-pewee
- Woodland Area -Sensitive Bird Breeding Habitat
- Amphibian Breeding Habitat (Wetlands)
- Terrestrial Crayfish

Candidate SWH was identified for:

- Bat Maternity Colonies

SWH for the Site and immediately adjacent natural features is identified on Figure 6.

# 4.0 Description of Development

The proposed DPOS consists of single detached (291 units), semi-detached (24 units), townhouses (74 units), as well as a school, parkland, open space, and stormwater management facilities (SWMF), all planned within the western portion of the site bounded on the east by wetlands and on the west by the Grey County CP Rail Trail. A future road right-of-way is planned to connect the west and east portions of the site. The proposed SWMF abutting the north edge of the site and the adjacent wetland is planned to have an area of 1.56 ha and outlet directly to the wetland. A Functional Servicing Report (FSR) has been prepared by Crozier (2023) under separate cover.

# 5.0 Impact Assessment

## 5.1 Direct Impacts

Direct impacts include those that have an immediate effect on natural features and are generally associated with site preparation and construction activities, such as vegetation clearing and grubbing, grading, excavation, paving and building of structures.

### 5.1.1 Environmental Constraints

The DPOS was overlaid on the features and constraints mapping to determine whether residual impacts remain (Figure 7). The figure presents natural features and the wetland boundaries have been verified by GRCA in the field but have not been surveyed (to be completed as a condition of Draft Plan Approval in

2023). Following the receipt of the survey of wetland boundary limits, mapping will be updated with the surveyed linework, and the application of buffers required through applicable municipal, GRCA and SVCA policy frameworks will occur, with updates to be provided at the next stage of the application process (if required redlines will be made to the plan as per conditions of Draft Plan Approval). These features and recommended buffers are presented in Table 6.

**Table 6: Recommended Buffers to Natural Features and Structures**

| Policy | Woodland | Wetland | Watercourse | Top of Bank | Floodplain[1] | Hedgerow Trees |
|---|---|---|---|---|---|---|
| Grey County OP | Not specified | 30 m | 30 m (less with rationale/no negative impacts) | 30 m (less with rationale/no negative impacts) | Not identified in the OP | Not identified in the OP |
| Township of Southgate OP | Not identified in the OP | Not identified in the OP | 15 m, or 30 m for coldwater stream | Defers to Conservation Authority (CA) | Not identified in the OP | Not identified in the OP |
| GRCA | Not specified | 30 m (less with rationale/no negative impacts) | 15 m (Superseded by floodplain) | 15 m | 15 m | GRCA does not regulate individual trees except within the regulatory limit |
| SVCA | Not specified | 30 m (less with rationale/no negative impacts) | 15 m (Superseded by floodplain) | 15 m | 15 m | SVCA does not regulate individual trees except within the regulatory limit |
| Buffers recommended | 10 m | 30 m (less with rationale/no negative impacts) | Not represented because other buffers extend further | 15 m | 15 m | Estimate 3 m but could change with detailed tree preservation report |

[1] *A buffer would also be applied to the watercourse however the floodplain and wetland plus buffers far exceeds that constraint therefore it is not illustrated.*

Note: grading is generally not allowed within the buffers unless approved. Development is expected to meet existing grades at the limit of the buffer.

### 5.1.2 Fish and Aquatic Habitat

The watercourses identified on site were assessed using the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC and TRCA, 2014). No fish were observed during field investigations and all the features were found to be dry during the August 2022 assessment. Due to either their contribution to downstream fish habitat through allochthonous transport, or their association with important riparian or terrestrial habitat (e.g. wetlands), appropriate management recommendations are applied to each feature to allow their primary functions to be maintained (see Figure 3). The proposed DPOS would remove a portion of the HDF to accommodate development. This feature was not identified as a watercourse and instead as a shallow, non vegetated swale providing overland flow to offsite wetlands to the north. As flow to these features is to be maintained through the outlet of the proposed SWMF, which would implement appropriate quality control measures, impacts to fish, and fish habitat are not expected.

### 5.1.3 Terrestrial Habitat

The DPOS is situated in agricultural lands and is generally set back from natural feature constraints. The plan overlies the HDF located in the center of the agricultural field that provides flow to offsite wetlands. The SWMF for the DPOS is planned for the northernmost portion of this HDF and will outlet to the same wetlands. Therefore, as water flow to the wetlands will be maintained, it is anticipated that wetland functions will also be maintained, provided appropriate pre and post quality controls are implemented. As the outflow from the SWMF to the wetlands is proposed to be greater than current, pre-development volume (as per current calculations), a detailed hydrologic study is underway to assess the capacity of the downstream wetland features. The results of this study, along with the assessment of wetland sensitivity will guide the application of mitigation measures to maintain wetland features and functions. This assessment is proposed as a condition of Draft Plan Approval and the proposed ToR for this study is included in Appendix E.

The proposed future road right-of-way that will connect the western and eastern portions of the site will bisect the wetlands located in the center of the site. Selection of a preferred alignment will occur via an assessment of alternative options that considers planning, engineering, and environmental factors as well as relevant policies. This assessment will be provided at a later stage of the application process and could be considered a condition of Draft Plan Approval or as a component of the next phase of development (DPA).

The DPOS also overlies portions of hedgerows that occur along the northern and southern boundaries of the site. These proposed removals are to be addressed under the applicable by-law. A tree preservation plan will be prepared at the detailed design stage to the satisfaction of the appropriate authority to support the Site Plan Application.

Small portions of the planned residential lots appear to encroach within the southwestern edge of the wetland natural features as they are currently delineated. Following the receipt of the survey of wetland boundary limits, applicable municipal, GRCA and SVCA setbacks will be applied with subsequent updates to the setbacks and plan. These updates will be provided at the next stage of the application process.

Generally, impacts to features on and adjacent to the site can be minimized through the implementation of appropriate erosion and sediment control measures, and the avoidance of sensitive timing windows for birds and bats following current guidance from Environment Canada and the MECP (April 1st-September 30th). Tree removals required for construction will occur in accordance with the *Grey County Forestry Management By-law #4341-06*, and restoration of disturbed areas and buffers are to be planted and seeded as per a future landscape restoration plan to be provided under separate cover.

To assist with further assessment of impacts and the application of appropriate mitigation measures, the wetlands on site and downstream of the proposed SWMF will be assessed following the guidance of the Ontario Wetland Evaluation System and utilize the information available from observations made on the project site. These assessments are planned to occur in 2023 and should be considered a condition of Draft Plan Approval. The proposed ToR for this assessment is located in Appendix E.

### 5.1.4 Species of Conservation Concern

To date, three SAR (Eastern Wood-pewee, Barn Swallow, and Western Chorus Frog) have been detected on site, and there is the likelihood for SAR bats to occur as well. Foraging habitat for Monarch is present in meadow and meadow marsh communities on site and any removals can be restored within the setbacks of protected natural features. For the current DPOS, the plan is, for the most part, set back from wetland habitat for Western Chorus frog as well as habitat for Eastern Wood-pewee, and removal of the outbuilding providing Barn Swallow nesting habitat is not proposed, therefore, impacts to these species or their habitat are not anticipated. The verification of feature boundaries with review agencies, and subsequent updates to setbacks (if required) will ensure adequate protection for these species and their habitat. To avoid potential impacts to bats that may be utilizing trees on site, removal of trees should occur outside of the active season for bats which typically occurs between April 1st and September 30th.

## 5.2 Indirect Impacts

Indirect impacts may occur from the residential occupation of the development and could include the dumping of refuse, encroachment of yards into natural features, and unsanctioned use of natural features for recreation (e.g., trails, parties, etc.). Off-leash or unconfined household pets may disturb the natural features and impact the natural function through disrupting sensitive breeding behaviours or predation of native fauna (e.g., cats hunting wild birds). Stormwater runoff from built-up impermeable areas including roads may contain sediments and pollutants such as oils and hydrocarbons. Overall, these indirect impacts could result in damage to the ecological functions of the natural features through the removal of native species, the introduction and spread of non-native or invasive flora or fauna, and degradation due to pollution.

In order to minimize the potential for these indirect impacts, mitigations can be implemented to provide physical barriers (i.e. fences), create awareness (education through interpretive signage), provide appropriate avenues for recreation (sanctioned trail system) and enforcement of applicable by-laws. Setbacks identified in the EIS should be restored to provide a buffer to the existing natural features and ultimately result in an increase in natural area. The use of low impact developments (LID) in the design of the proposed development would aid in the reduction of stormwater runoff and appropriately pre-treat any runoff prior to entry into the stormwater management facility.

## 5.3 Monitoring

Monitoring of environmental conditions both during and post construction are important components to determine the effectiveness of implemented mitigation and restoration measures. The details specifying the types of monitoring required, their locations and timing are to be provided at the detailed design stage of site plan application.

# 6.0 Policy Review and Conformity

The following section describes policies relevant to the natural environment and describes how the natural heritage features identified within this EIS have been addressed. Policy conformity is summarized in Table 7.

**Table 7: Summary of Policy Conformity**

| POLICY | CONFORMITY | RATIONALE |
|---|---|---|
| *Provincial Policy Statement* (PPS, 2020) | In compliance | • No features of provincial interest identified on the site (significant woodlands, significant wildlife habitat) or adjacent lands will be negatively affected should mitigation recommendations be implemented (avoidance/setbacks)<br>• Wetlands on site and downstream of proposed SWMF to be assessed using the guidance of the Ontario Wetland Evaluation System during the 2023 field season as a condition of Draft Plan Approval |
| *Grey County Official Plan (2019)* | In compliance with natural heritage policies | • EIS describes the features and functions of the subject lands and confirms there are no significant/natural heritage features that will be negatively affected by the proposed DPOS |
| *Township of Southgate Official Plan (2022)* | In compliance with natural heritage policies | • DPOS is set back from features identified in OP section 6 such that negative impacts are not anticipated should mitigation recommendations be implemented<br>• Tree removals will be subject to the appropriate municipal by-law |
| *Ontario Regulation 150/06 (GRCA)* | Permit for development in a regulated area required | • Minor encroachment into wetland features<br>• Survey of conservation authority verified feature boundary limits required in order to determine appropriate setbacks and mitigation (to be completed in 2023)<br>• Wetlands on site and downstream of proposed SWMF to be assessed using the guidance of the Ontario Wetland Evaluation System during the 2023 field season as a condition of Draft Plan Approval |
| *Ontario Regulation 169/06 (SVCA)* | Permit for development in a regulated area required | • Alteration to a mapped watercourse and regulated area is proposed to accommodate the DPOS<br>• Minor encroachment into wetland features<br>• Survey of conservation authority verified feature boundary limits required to determine appropriate setbacks and mitigation (to be completed in 2023)<br>• Wetlands on site and downstream of proposed SWMF to be assessed using the guidance of the Ontario Wetland Evaluation System during the 2023 field season as a condition of Draft Plan Approval |
| *Endangered Species Act* (ESA, 2007) | Compliant with the implementation of recommended mitigation | • Potential for SAR bats to occur<br>• Should it be deemed necessary, consultation with MECP regarding these impacts will be coordinated during subsequent phase of development |

| POLICY | CONFORMITY | RATIONALE |
|---|---|---|
| *Migratory Birds Convention Act* (MBCA, 1994) | Compliance with the implementation of recommendation | • Vegetation clearing will not occur within the breeding bird period provided under Environment Canada guidance for periods of highest nesting probability (i.e. cannot occur generally between April 1st and August 31st) and may be extended to September 30th in consultation with MECP for mitigation of interference with SAR bats |
| *Fisheries Act (2019)* | Conforms | • No fish habitat identified on site of proposed DPOS<br>• Flow input to downstream habitat to be maintained |

# 7.0 Conclusions and Recommendations

To date, field investigations and analysis have determined that the site of the proposed DPOS is primarily agricultural lands, with principal constraints consisting of large areas of wetland present within the northeast portion of the site as well as adjacent to the north boundary of the site. A headwater drainage feature located in the center of the proposed plan will be removed to accommodate the development, although flow input to downstream features will be maintained through stormwater outlet.

We recommend that best management practices are implemented with respect to sediment and erosion control, excess soil and fill, vegetation clearing, construction timing windows, and stabilization of disturbed soils. The analysis of the natural heritage features and functions associated with proposed Draft Plan of Subdivision is ongoing to determine their sensitivity and appropriate mitigation measures. As such, in addition to the recommendations below, it is recommended that the following be considered as conditions of draft plan approval:

- Survey of verified natural feature boundaries
- Completion of the hydrologic study
- Completion of wetland assessments
- Alternatives assessment for proposed east-west arterial road alignment
- Provision of mitigation recommendations based on the results of the above (e.g., SWM controls, buffers, etc.)

Details pertaining to the application of mitigation measures (e.g., location, type, plans, etc.) will be provided at the detailed design stage of the application process. A Terms of Reference (ToR) for the ongoing and proposed studies required is provided in Appendix E. If the conditions of Draft Plan Approval determine an increase in sensitivity and enhanced mitigation is required, then a redline of the Draft Plan can be provided where applicable.

## 7.1 Recommendations

The following operational constraints and mitigation strategies are recommended as a minimum for use during the construction phase of this project for the protection of natural heritage features and functions on and adjacent to the subject lands (updates will be provided if applicable following the clearance of Draft Plan Approval conditions):

- A Tree inventory and Protection Plan is to be completed for trees that may be impacted by the proposed development.
- Recommendations as outlined in the accompanying application documents (i.e. geotechnical Investigation reports and or hydrogeology reports) are to be implemented where applicable.
- Permanent post and page wire or chain-link fence is recommended along the limits of proposed buffers. This fencing should be sturdy beyond the typical rebar and sediment fabric fence. Prior to the commencement of construction, the limits of protection areas (buffers) are to be delineated and fenced to avoid inadvertent intrusion of machinery or other activities such as

stockpiling of materials. Temporary sediment control fencing can be attached to the fencing and must be maintained and remain in place until final grading and landscaping has been completed.

- Where possible, grading limits are to respect minimum root protection zones for trees along the woodland and in tree protection zones for trees to be retained beyond the buffers, to be determined in the TPP. Minimum protection of the root zone is measured from the base of the tree to the tree's dripline. Earthworks/ grading, stockpiling of material etc. is to be directed away from protection areas. Final site grading and design is to ensure these areas are not encroached upon unless approved by the municipality and/or CA where minor grading intrusions may be necessary (e.g. to match grades).
- Vegetation removals associated with construction related activities are to be minimized. Additional tree hording/ fencing may be required in consultation with the CA to prevent intrusion and stockpiling of materials into adjacent forests and wetland.
- Stockpiling of materials should be kept away from adjacent natural features; no fill should be placed in and around the wetland communities.
- Exposed soils should be re-vegetated as soon as possible with native seed mixes to reduce erosion. If stabilization is not possible by plantings, then other appropriate erosion controls (e.g. coir mats) should be applied in the interim.
- A risk management plan should be prepared which outlines the best management practices and appropriate measures regarding the storage of chemicals (such as oils, degreasers and salt) on site, including spill response kits, secondary containment, a spill response plan and training.
- It is the responsibility of the proponent to ensure that the works are in conformity with the Migratory Bird Convention Act and Endangered Species Act, 2007 in that no migratory bird(s) or SAR species will be harassed, harmed, killed or nests / habitats destroyed by the proposed work. The recommended avoidance window (where vegetation removal should be avoided) is from April 1$^{st}$ to August 31$^{st}$ but may be extended to September 30$^{th}$ in consultation with MECP. No avoidance window absolves the proponent or their contractors from contravening the MBCA or ESA. If a nest, egg, fledging or SAR species is encountered work must stop and the appropriate agency (e.g. Environment Canada) be consulted for advice.
- Consultation with the DFO will be undertaken to determine appropriate mitigation and/or permit requirements pertaining to work within or adjacent to aquatic habitat.
- Restoration of the buffer is proposed. A restoration landscape plan is to be prepared under separate cover. Native Milkweed (*Asclepias* sp.) should be incorporated into any buffer planting seed mix and where possible other natural areas on the property. The proposed restoration plan should also include construction areas not being developed by structures or hardscaped (i.e., servicing infrastructure).
- Fencing and signage should be installed to prevent unwanted access or encroachment to natural areas and their buffers and provide awareness regarding the importance and sensitivity of the natural features and functions.
- LID measures can be utilized where appropriate in the design to reduce stormwater runoff and associated environmental pollutants.

- To protect wildlife in general, no animals are to be knowingly harmed. If wildlife is encountered during construction, work must stop, and animals be allowed to disperse on their own. If necessary, the CA or MNRF should be contacted for advice.
- Construction monitoring by an ecologist/arborist and certified inspector of sediment and erosion control (CISEC) is recommended as a part of a monitoring program to be developed. This may include (but not limited to): photographic records, periodic SEC inspection reports and inspection of protected limits to ensure no encroachment and other mitigation measures are implemented.
- All outdoor lighting (including any new street lighting and external lighting on buildings) should have cut-off optics and be directed towards the ground and away from the natural areas.
- Compensation for the removal of potential habitat for SAR bats, if required, will be determined through consultation with the MECP in accordance with ESA policies.
- All Greenway System lands should be conveyed to public ownership through the development process.

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Ontario Ministry of Natural Resources and Forestry, 2015. Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E

Ontario Nature. 2019. Ontario Reptile and Amphibian Atlas: a citizen science project to map the distribution of Ontario's reptiles and amphibians. Ontario Nature, Ontario. Available: https://www.ontarioinsects.org/herp/index.html

Toronto Region Conservation Authority and Credit Valley Conservation Authority. 2014. Evaluation, Classification and Management of Headwater Drainage Features Guidelines. 27 pp. Accessed at: http://www.trca.on.ca/dotAsset/180724.pdf

# 9.0 Statement of Limitations

This report has been prepared and the work referred to in this report has been undertaken by SLR Consulting (Canada) Ltd. (SLR) for Flato Developments Inc., hereafter referred to as the "Client". The report has been prepared in accordance with the Scope of Work and agreement between SLR and the Client. It is intended for the sole and exclusive use of Client. Other than by the Client and as set out herein, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted unless payment for the work has been made in full and express written permission has been obtained from SLR.

This report has been prepared for specific application to this site and site conditions existing at the time work for the report was completed. Any conclusions or recommendations made in this report reflect SLR's professional opinion.

Information contained within this report may have been provided to SLR from third party sources. This information may not have been verified by a third party and/or updated since the date of issuance of the external report and cannot be warranted by SLR. SLR is entitled to rely on the accuracy and completeness of the information provided from third party sources and no obligation to update such information.

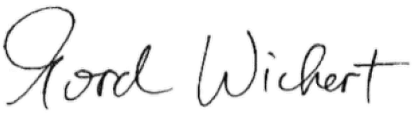
Nothing in this report is intended to constitute or provide a legal opinion. SLR makes no representation as to the requirements of compliance with environmental laws, rules, regulations or policies established by federal, provincial or local government bodies. Revisions to the regulatory standards referred to in this report may be expected over time. As a result, modifications to the findings, conclusions and recommendations in this report may be necessary.

The Client may submit this report to the appropriate environmental regulatory authorities or persons for review and comment purposes.

# 10.0 Closure

Prepared and Reviewed By:

**SLR Consulting (Canada) Ltd.**



Gord Wichert, Ph.D., P.Bio
Technical Director – Ecology

Matthew Ross, B.Sc
Terrestrial Ecologist

Kim Logan, B.Sc., P.Geo. (Limited). P. Biol.
Senior Ecologist

Distribution: 1 electronic copy –Flato Developments,

1 electronic copy – SLR Consulting (Canada) Ltd.

# Figures

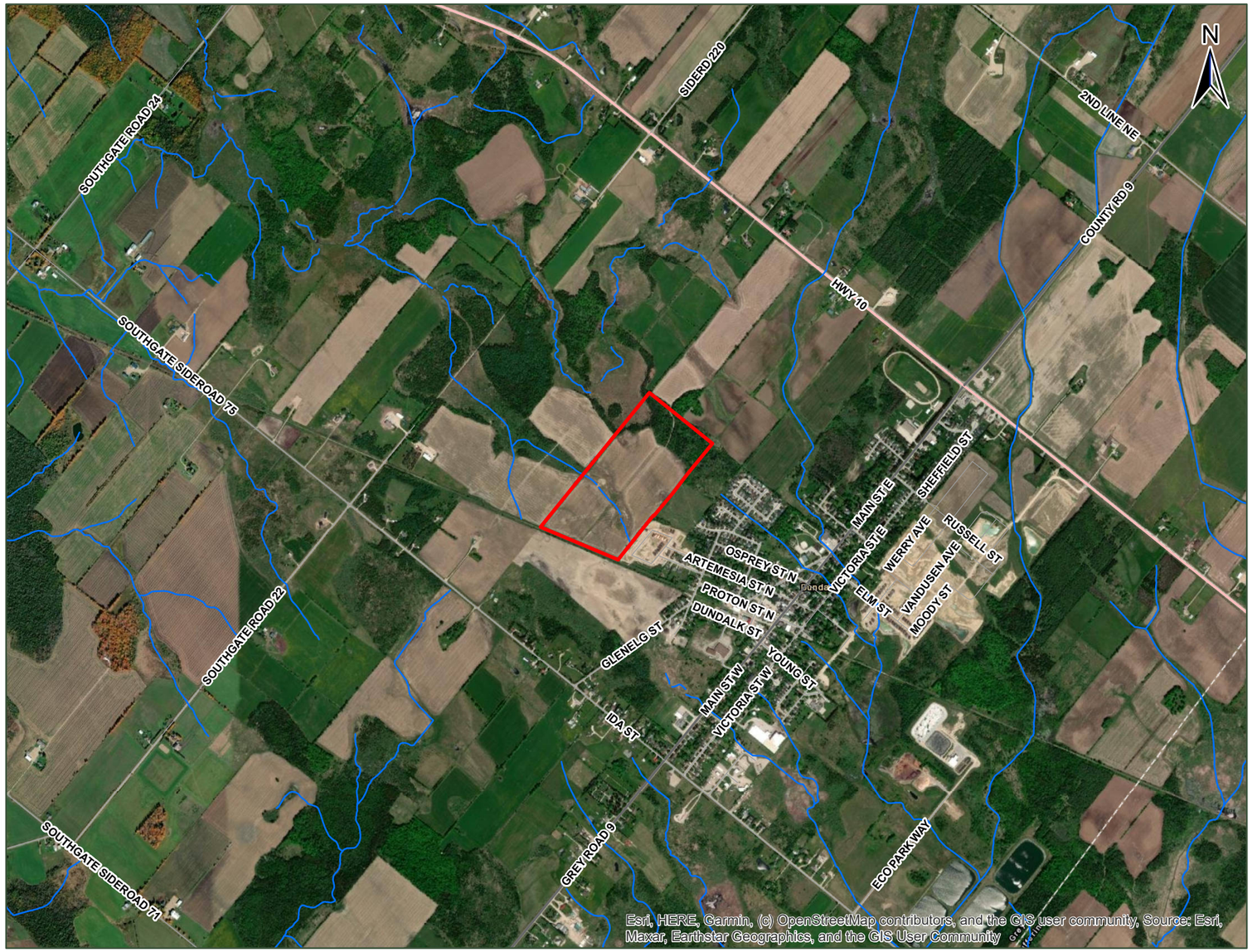
## Environmental Impact Study

### Glenelg Phase 3

### Flato Developments Inc.

SLR Project No. 209.30125.00003

May 24, 2023



**NOTES:**
SITE BOUNDARY; SCHAEFFER DZALDOV BENNETT LTD.; 2022

**LEGEND**
SITE BOUNDARY

0 250 500 1,000 1,500 m

SCALE 1:25,000
PAGE SIZE 11 x 17
NAD 1983 UTM Zone 17N
THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY
AND SHOULD NOT BE USED FOR NAVIGATION

MHBC PLANNING, URBAN DESIGN & LANDSCAPE ARCHITECTURE
GLENELG PHASE 3
DUNDALK, ONTARIO, CANADA

ENVIRONMENTAL IMPACT STUDY

**SITE LOCATION**

SLR

FIGURE NO:
**1**

DATE: May 10, 2023
PROJECT NO: 209.V30125.00003

547220 547720 548220

4891532


LEGEND

- SITE BOUNDARY
- MONITORING WELL
- MINI-PIEZOMETER
- PERMANENT WATERCOURSE
- DRAINAGE DIVIDE

**NOTES:**

BASEDATA:
ONTARIO MINISTRY OF NATURAL RESOURCES, LAND INFORMATION ONTARIO (LIO)

0 25 50 100 150 m

SCALE 1:3,500
PAGE SIZE 11 x 17
NAD 1983 UTM Zone 17N

THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY
AND SHOULD NOT BE USED FOR NAVIGATION

MHBC PLANNING, URBAN DESIGN & LANDSCAPE ARCHITECTURE
GLENELG PHASE 3
DUNDALK, ONTARIO, CANADA

ENVIRONMENTAL IMPACT STUDY

# HYDROGEOLOGICAL INVESTIGATIONS

SLR

FIGURE NO:
**2**

DATE: May 10, 2023

PROJECT NO: 209.V30125.00003

547220 547720 548220

4891532


4891032

547220 547720 548220

**LEGEND**

- SITE BOUNDARY
- OBSERVATION LOCATION

**HEADWATER DRAINAGE FEATURE**

- NO MANAGEMENT
- PROTECTION
- CARTOGRAPHIC WETLAND
- WATERBODIES
- PERMANENT WATERCOURSE

**NOTES:**

BASEDATA:
ONTARIO MINISTRY OF NATURAL RESOURCES, LAND INFORMATION ONTARIO (LIO)

0 25 50 100 150 m

SCALE 1:3,500
PAGE SIZE 11 x 17
NAD 1983 UTM Zone 17N

THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY
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MHBC PLANNING, URBAN DESIGN & LANDSCAPE ARCHITECTURE
GLENELG PHASE 3
DUNDALK, ONTARIO, CANADA

ENVIRONMENTAL IMPACT STUDY

# HEADWATER DRAINAGE FEATURES

SLR

FIGURE NO:
**3**

DATE: May 10, 2023 PROJECT NO: 209.V30125.00003


**LEGEND**

- SITE BOUNDARY
- ECOLOGICAL LAND CLASSIFICATION (SLR CONSULTING, 2022)
- WATERBODIES
- PERMANENT WATERCOURSE
- RAILWAY

| ELC Code | ELC Description |
|---|---|
| Ag | Agriculture |
| CUM1-1 | Cultural Meadow |
| FOD5-2 | Dry-Fresh Sugar Maple-Beech Deciduous Forest |
| HR | Hedgerow |
| MAM2-2/SWT2- | Reed Canary Grass Mineral Meadow Marsh with Willow Thicket Swamp inclusion |
| MAS2 | Mineral Shallow Marsh Ecosite |
| MAS2/SWC1-1 | Mineral Shallow Marsh with White Cedar Coniferous Swamp inclusion |
| SWC1-1 | White Cedar Mineral Coniferous Swamp |
| SWD | Mineral Deciduous Swamp |
| SWD3-1/MAM2-2 | Red Maple Mineral Deciduous Swamp with Reed Canary Grass Mineral Meadow Marsh inclusion |
| SWM1-1 | White Cedar - Hardwood Mineral Mixed Swamp |
| SWT2-2 | Willow Mineral Thicket Swamp |

**NOTES:**
BASEDATA:
ONTARIO MINISTRY OF NATURAL RESOURCES, LAND INFORMATION ONTARIO (LIO)

0 25 50 100 150 m

SCALE 1:3,500
PAGE SIZE 11 x 17
NAD 1983 UTM Zone 17N
THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY AND SHOULD NOT BE USED FOR NAVIGATION

MHBC PLANNING, URBAN DESIGN & LANDSCAPE ARCHITECTURE
GLENELG PHASE 3
DUNDALK, ONTARIO, CANADA

ENVIRONMENTAL IMPACT STUDY

# ECOLOGICAL LAND CLASSIFICATION

SLR

FIGURE NO:
**4**

DATE: May 10, 2023
PROJECT NO: 209.V30125.00003

547220 547720 548220

4891532


4891032

547220 547720 548220

**LEGEND**

- SITE BOUNDARY
- AMPHIBIAN SURVEY LOCATION (2022)
- BREEDING BIRD SURVEY (TRANSECT; 2022)
- WATERBODIES
- PERMANENT WATERCOURSE
- RAILWAY

**NOTES:**

BASEDATA:
ONTARIO MINISTRY OF NATURAL RESOURCES, LAND INFORMATION ONTARIO (LIO)

0 25 50 100 150 m

SCALE 1:3,500
PAGE SIZE 11 x 17
NAD 1983 UTM Zone 17N

THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY
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MHBC PLANNING, URBAN DESIGN & LANDSCAPE ARCHITECTURE
GLENELG PHASE 3
DUNDALK, ONTARIO, CANADA

ENVIRONMENTAL IMPACT STUDY

# SURVEY LOCATIONS

SLR

FIGURE NO:
**5**

DATE: May 10, 2023

PROJECT NO: 209.V30125.00003


**LEGEND**

- SITE BOUNDARY

**CONFIRMED SWH**

- AMPHIBIAN BREEDING HABITAT (WETLANDS)
- EASTERN WOOD-PEWEE
- TERRESTRIAL CRAYFISH
- WOODLAND AREA - SENSITIVE BIRD BREEDING HABITAT

**CANDIDATE SWH**

- BAT MATERNITY COLONIES
- WATERBODIES
- PERMANENT WATERCOURSE
- RAILWAY

**NOTES:**

BASEDATA:
ONTARIO MINISTRY OF NATURAL RESOURCES, LAND INFORMATION ONTARIO (LIO)

0 25 50 100 150 m

SCALE 1:3,500
PAGE SIZE 11 x 17
NAD 1983 UTM Zone 17N

THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY AND SHOULD NOT BE USED FOR NAVIGATION

MHBC PLANNING, URBAN DESIGN & LANDSCAPE ARCHITECTURE
GLENELG PHASE 3
DUNDALK, ONTARIO, CANADA

ENVIRONMENTAL IMPACT STUDY

# SIGNIFICANT WILDLIFE HABITAT

SLR

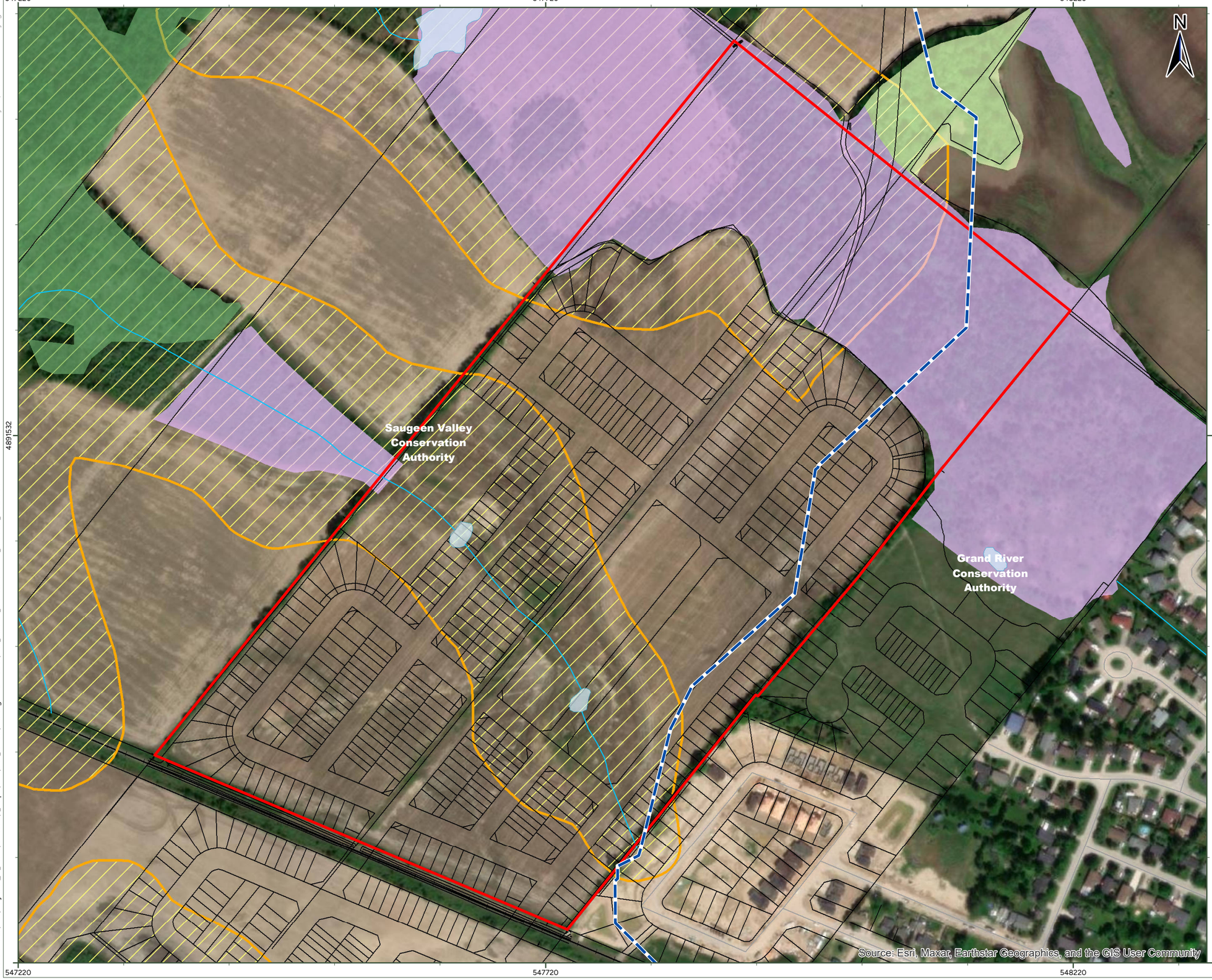
FIGURE NO: **6**

DATE: May 10, 2023

PROJECT NO: 209.V30125.00003

547220 547720 548220

4891532




4891032

547220 547720 548220

**LEGEND**

- SITE BOUNDARY
- SITE PLAN (MHBC, MAY 18, 2023)
- CONSERVATION AUTHORITY ADMIN AREA
- APPROXIMATE SCREENING AREA (SVCA)
- REGULATORY FLOODPLAIN (GRCA)
- SIGNIFICANT WOODLANDS (GREY COUNTY OFFICIAL PLAN (2018))
- WOODED ECOLOGICAL LAND CLASSIFICATION
- WETLAND ECOLOGICAL LAND CLASSIFICATION
- WATERBODIES
- PERMANENT WATERCOURSE
- RAILWAY

**NOTES:**
BASEDATA:
ONTARIO MINISTRY OF NATURAL RESOURCES, LAND INFORMATION ONTARIO (LIO)

0 25 50 100 150 m

SCALE 1:3,500
PAGE SIZE 11 x 17
NAD 1983 UTM Zone 17N

THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY AND SHOULD NOT BE USED FOR NAVIGATION

MHBC PLANNING, URBAN DESIGN & LANDSCAPE ARCHITECTURE
GLENELG PHASE 3
DUNDALK, ONTARIO, CANADA

ENVIRONMENTAL IMPACT STUDY

# ENVIRONMENTAL CONSTRAINTS AND SITE PLAN

SLR

FIGURE NO: **7**

DATE: May 24, 2023 PROJECT NO: 209.V30125.00003

# Appendix A EIS Terms of Reference and Correspondence

## Environmental Impact Study

**Glenelg Phase 3**

**Flato Developments Inc.**

SLR Project No. 209.30125.00003

May 24, 2023

SLR Consulting (Canada) Ltd.
300 Town Centre Boulevard, Suite 200, Markham, ON L3R 5Z6

~~June 7, 2022~~July 28, 2022

~~Laura Warner~~Chris Lorenz, Resource Planner
Grand River Conservation Authority
400 Clyde Road, Box 729
Cambridge, ON N1R 5W6

Michael Oberle~~Brandi Walter~~, Environmental Planning Coordinator
Saugeen Conservation
261123 Grey Road 28 RR1
Hanover, ON N4N 3B8

SLR Project No.: 209.30125.00003

**RE: Terms of Reference - Scoped Environmental Impact Study**
**Lots 223, 224, 225, and 226, Concessions 1 and 2 W, Dundalk, Ontario**

SLR Consulting (Canada) Ltd. (SLR) is pleased to submit this Terms of Reference (ToR) on behalf of Flato Developments Inc. outlining the tasks required to complete a Scoped Environmental Impact Study (EIS) and Tree Inventory and Preservation Plan (TIPP) for Lots 223, 224, 225, and 226, Concessions 1 and 2 W in Dundalk, Ontario (Site). The southeast half of the Site falls under the jurisdiction of the Grand River Conservation Authority (GRCA) and the northwest half of the Site is under the jurisdiction of Saugeen Conservation (SVCA).

## Project Understanding

SLR understands that the Site is proposed for development into a residential subdivision and is subject to a Ministerial Zoning Order (MZO). Natural features on the site include:

- Three tributaries to the Grand River (headwater drainage features [HDF]) and their associated floodplains
- Three unevaluated wetlands

Most of the Site is within GRCA or SVCA regulated lands. Features within the Site that are regulated by GRCA include unevaluated wetlands, a watercourse of unknown thermal regime, and an estimated associated floodplain. GRCA also identified the presence of two municipal drains (98- -L227C1W_A [tiled/closed] and 98- -L227C1W_B [open]). Permits under *Ontario Regulations (O. Reg.) 150/06 (GRCA) and 169/06 (SVCA): Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* are required for any development within regulated areas.

The GRCA (2015) *Policies for the Administration of O. Reg. 150/06* and SVCA (2017) *Environmental Planning and Regulations Policies Manual* state that any development within 30 m of unevaluated or locally significant wetlands (also known as the area of interference) requires permission from the appropriate conservation authority. Setback distances for development near regulated areas surrounding HDF typically require in-field assessment to determine riverine flooding and erosion hazard allowances and valley slopes or meander belt allowance. Staking of the unevaluated wetlands is also typically required.

## Terms of Reference

This ToR has been prepared to frame the study requirements for review by the Township of Southgate, Grey County, SVCA, and GRCA. The ToR was prepared in the context of the following:

- *Provincial Policy Statement, 2020*
- Federal *Fisheries Act, 2019*
- *Migratory Birds Convention Act, 1994*
- *Endangered Species Act, 2007*
- Federal *Species at Risk Act, 2002*
- *Greenbelt Plan, 2017*
- *O. Regs. 150/06 and 169/06*
- GRCA Planning and Permitting Policies, including GRCA (2015) *Policies for the Administration of O. Reg. 150/06*
- SVCA (2017) *Environmental Planning and Regulations Policies Manual*
- Township of Southgate and Grey County Official Plans
- GRCA (2005) *Environmental Impact Study Guidelines and Submission Standards for Wetlands*
- *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (Toronto and Region Conservation Authority and Credit Valley Conservation, 2014)

Specifically, the tasks to be included within the ToR are:

1. Prepare and attend a site meeting with representatives from the Township of Southgate, Grey County, SVCA, and GRCA (if necessary) and stake the major features of the Site. GRCA has requested that wetland boundaries be delineated during the appropriate season using a combination of flagging tape, wire flags, and/or wooden stakes. The wetland boundary will be verified by GRCA and subsequently surveyed and clearly illustrated in the EIS report. A minimum buffer width and supporting rationale will also be included in the EIS report. GRCA also recommended completing a wetland evaluation to help address the *Provincial Policy Statement, 2020*.~~(e.g., wetland limits and woodland dripline).~~
2. Compile and synthesize information for the property from existing background documents, studies, and provincial databases, including biodiversity atlases for birds, mammals, herpetofauna, and butterflies, ~~including~~as well as a gap analysis review.
3. Undertake scoped seasonal inventories for amphibians, vegetation, and breeding birds (including Species at Risk [SAR]) in accordance with widely accepted provincial standards (e.g. Birds Canada et al. [2008] Marsh Monitoring Program Participant's Handbook for Surveying Amphibians, Ontario Breeding Bird Atlas [2001] Guide for Participants), review and update vegetation communities in accordance with the provincial Ecological Land Classification system and existing available data, and screen lands for the presence of Butternut (*Juglans cinerea*) trees and other SAR as well as SAR habitat potential.
4. Aerial photography indicates potential drainage across the Site. The Rapid Method provided in the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (Toronto and Region Conservation Authority and Credit Valley Conservation, 2014) will be applied if appropriate.
5. Aquatic habitat and fisheries investigations will be completed in late summer, if appropriate.

6. Synthesize the above information and analyze the findings to determine the presence of features and attributes of local and provincial interest under the *Planning Act, 1990* and to the Township of Southgate, Grey County, SVCA, and GRCA.
7. Establish appropriate buffers and setbacks for features of significance with reference to the policies and standards of the Township of Southgate, Grey County, SVCA, and GRCA.
8. Prepare an EIS report, including GIS generated figures for submission to the Township of Southgate, Grey County, SVCA, and GRCA in support of a final version of the Site Plan application. This report will rely on input from the Hydrogeology Report, the Functional Servicing Report (prepared by Crozier and Associates), and other submission materials.

### *Species at Risk*

SLR will complete a desktop analysis to review potential for SAR and SAR habitat including species that may be of regional or local significance in accordance with Provincial regulations. This analysis will include accessing the Ministry of Northern Development, Mines, Natural Resources and Forestry's (NDMNRF) digital Land Information Ontario and Natural Heritage Information Centre databases to obtain a list of SAR known to occur in or near the Site and refining the list to relevant species potentially occurring within the Site.

In addition to the desktop screening, SLR will complete SAR screenings for Western Chorus Frog (*Pseudacris triseriata*) and Butternut to inform consultation with the Ministry of the Environment, Conservation and Parks (MECP). The need for additional targeted SAR surveys will be determined in consultation with MECP. ~~Otherwise, targeted SAR surveys are not anticipated; however, if SAR are incidentally observed during field investigations an Information Gathering Form will be submitted to the Ministry of the Environment, Conservation and Parks~~.

### *Headwater Drainage Feature*

All components of the headwater sampling protocol (OSAP S4.M10) will be applied to complete a rapid assessment of the HDF on Site following the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (Toronto and Region Conservation Authority and Credit Valley Conservation, 2014). The assessment will document HDF form and flow conditions, riparian vegetation, channel connectivity, and site features that are important components of habitat.

### *Staking of Natural Features*

In collaboration with the GRCA, SVCA, and Township of Southgate staff, SLR will confirm and stake the appropriate natural feature boundaries that are present on the Site (HDF, wetlands, and woodland dripline). SLR will coordinate with GRCA, SVCA, and Township staff to confirm and agree to the staked limits. GRCA and SVCA regulation and floodplain limits will be included on a figure but will be delineated through air photo interpretation and online sources.

### *Arborist Study*

The TIPP will conform to the standards and specifications defined under the Township of Southgate Fill/Site Alteration By-law No. 2017-049. The purpose of the TIPP is to provide an inventory and assessment of the trees within the Site, positioned outside of the staked features to be preserved in accordance with applicable procedures and guidelines. SLR will conduct the arborist work in two phases to support preliminary and detailed design work. Phase 1 will include a preliminary investigation to identify potential heritage trees or trees which may be required to be considered for preservation. Preliminary results will be presented in a

memorandum. Phase 2 will consist of consultation with the Township (and SVCA/GRCA, if necessary) to refine the area of the detailed arborist work, scope areas of concern to the Township only, and completion of a Buffer Restoration Plan, if required. Once an approved method is confirmed with the Township, an International Society of Arboriculture certified arborist will complete the evaluation under Phase 2 for trees that are recommended for removal or retention within the Site Plan.

*Scoped Environmental Impact Study*

The draft Scoped EIS report will include a description of the ecological features and functions that occur on and adjacent to the Site, information on proposed development conditions, constraint mapping (including maximum limits for building envelopes), impact analysis, and potential monitoring requirements. The Scoped EIS will also include recommendations for additional measures (next steps) required to achieve policy conformity and recommended restoration and/or enhancement measures, including thermal mitigation measures and enhanced quality control. The Scoped EIS will be prepared in accordance with the policies outlined in the GRCA (2005) *Environmental Impact Study Guidelines and Submission Standards for Wetlands* and the SVCA (2017) *Environmental Planning and Regulations Policies Manual*.

## Closure

Please confirm that these Terms of Reference for a Scoped EIS meet the intent of the information and study requirements for the subject property as referenced above. If you have any further questions or comments, we look forward to discussing them with you at your earliest convenience.

Yours sincerely,

SLR Consulting (Canada) Ltd.

**Megan Olson, M.Sc.**
Ecologist
416-333-8279
molson@slrconsulting.com

**Kim Logan, B.Sc., P.Geo. (Limited), P.Biol.**
Senior Ecologist
226-203-7214
klogan@slrconsulting.com

| | |
|---|---|
| **From:** | Chris Lorenz |
| **To:** | Megan Olson; m.oberle.@svca.on.ca |
| **Cc:** | Kim Logan |
| **Subject:** | RE: Terms of Reference for Scoped EIS - Dundalk, Ontario |
| **Date:** | August 04, 2022 9:19:10 AM |
| **Attachments:** | image001.png<br>image002.png<br>image006.png<br>image007.png<br>image008.png<br>image009.png<br>image010.png |

Thank you Megan. GRCA has no further comment.

**Chris Lorenz, M.Sc.**
Resource Planner
Grand River Conservation Authority
519-621-2763 ext. 2236

**From:** Megan Olson <molson@slrconsulting.com>
**Sent:** July 28, 2022 5:14 PM
**To:** Chris Lorenz <clorenz@grandriver.ca>; m.oberle.@svca.on.ca
**Cc:** Kim Logan <klogan@slrconsulting.com>
**Subject:** RE: Terms of Reference for Scoped EIS - Dundalk, Ontario

Hi Chris,
Thank you for your review and comments – I have addressed your comments in red below and provided an updated version of the Terms of Reference with the requested edits in Track Changes.

Thanks,
Megan

Megan Olson, M.Sc.
Ecologist

C +1 416 333 8279
E molson@slrconsulting.com

SLR Consulting (Canada) Ltd.
300 Town Centre Blvd, Suite 200, Markham, ON L3R 5Z6



**From:** Chris Lorenz <clorenz@grandriver.ca>
**Sent:** July 07, 2022 9:48 AM
**To:** Megan Olson <molson@slrconsulting.com>
**Cc:** Kim Logan <klogan@slrconsulting.com>
**Subject:** RE: Terms of Reference for Scoped EIS - Dundalk, Ontario

Hi Megan,

Please find below GRCA comments for the proposed Terms of Reference for the Concession 1 and 2W lands:

1. The subject lands are regulated by the GRCA owing to the presence of unevaluated wetlands, watercourse (thermal regime unknown), and associated floodplain (estimated). Updated the Project Understanding section of the TOR to include this information.

2. The following municipal drains are present:
    a. 98- -L227C1W_A (tiled/closed)
    b. 98- -L227C1W_B (open)

    Updated the Project Understanding section of the TOR to include this information.

3. It is requested that wetland boundaries be delineated during the appropriate season using a combination of flagging tape, wire flags, and/or wood stakes, surveyed, and clearly illustrated in the EIS report. The wetland boundary will also need to be verified by the GRCA. A minimum buffer width and supporting rationale should also be included in the EIS report. Item 1 of the TOR has been updated to address this comment.

4. The need for thermal mitigation measures and enhanced quality control should be discussed in the EIS report. The Scoped Environmental Impact Study section has been updated to include this comment.

5. We recommend that biodiversity atlases for birds, mammals, herpetofauna, and butterflies be consulted for background information. Item 2 of the TOR has been updated to address this comment.

6. A wetland evaluation is recommended to help address the Provincial Policy Statement. Item 1 of the TOR has been updated to include this recommendation.

7. We recommend that all biological surveys (e.g. breeding amphibians, breeding birds, vegetation) be conducted in accordance with widely accepted standards. The need for targeted surveys of species at risk should be determined in consultation with the Ministry of the Environment, Conservation, and Parks. Item 3 and the Species at Risk section of the TOR have been expanded upon to more directly address this comment.

8. According to mapping information obtained from the Ministry of Northern Development, Mines, Natural Resources, and Forestry (MNDMNRF), the following fish species have been recorded in the unnamed watercourse:
    a. Brook Stickleback, Central Mudminnow, Creek Chub, Fathead Minnow, Johnny Darter, Northern Redbelly Dace

    Thank you – we will include this data in the EIS.

9. According to mapping information obtained from the Natural Heritage Information Center, the following species at risk have been recorded on or within the vicinity of the subject lands:
    a. *Chelydra serpentina* (Snapping Turtle)
    b. *Sturnella magna* (Eastern Meadowlark)

    Thank you – we will include this data in the EIS.

Thanks Megan. Any questions please let me know.

**Chris Lorenz, M.Sc.**
Resource Planner
Grand River Conservation Authority

Office: 519-621-2763 ext. 2236
Email: clorenz@grandriver.ca
www.grandriver.ca | Connect with us on social

**From:** Chris Lorenz
**Sent:** July 7, 2022 9:38 AM
**To:** Megan Olson <molson@slrconsulting.com>
**Cc:** Kim Logan <klogan@slrconsulting.com>
**Subject:** RE: Terms of Reference for Scoped EIS - Dundalk, Ontario

Hi Megan,

Apologies for the delay. Please find below GRCA comments for the proposed Terms of Reference for the Ida Street sites:

1. The terms of reference state that the proposed subdivision development is subject to a Minister's Zoning Order. This should be clarified in the EIS report.

2. According to the existing map layer, no regulated features are present within the Grand River portion of the study area. However, a pond and headwater drainage feature (HDF) appear to be present at #752212 Ida Street. We agree that the HDF should be assessed using accepted guidelines developed by Credit Valley Conservation (CVC) and Toronto and Region Conservation Authority (TRCA).

3. Water depths and vegetation species in the pond should be assessed to determine if this feature is a wetland. If a wetland is determined to be present, it is requested that the boundary be delineated, verified by the GRCA and clearly illustrated in the EIS report. A minimum buffer width and supporting rationale should also be included in the EIS report.

4. It is requested that the key conclusions and recommendations of related hydrogeological assessments, stormwater management plans, and functional servicing plans be discussed in the EIS report.

5. The EIS report will need to clearly demonstrate that wetland hydroperiods are maintained, restored, or enhanced. A pre- and post-development wetland water balance assessment will be required to demonstrate that the development will not negatively impact the hydrologic or ecological functions of the wetlands located within the Saugeen River watershed.

6. The need for thermal mitigation measures and enhanced quality control should be discussed in the EIS.

7. We recommend that all biological surveys (e.g. breeding amphibians, breeding birds, vegetation) be conducted in accordance with widely accepted provincial standards. The need for targeted surveys of species at risk should be determined in consultation with the Ministry of the Environment, Conservation, and Parks.

8. According to mapping information obtained from the Ministry of Northern Development, Mines, Natural Resources, and Forestry (MNDMNRF), the following fish species have been recorded in the unnamed watercourse:

    - Blacknose Dace, Brassy Minnow, Brook Stickleback, Brown Bullhead, Central Mudminnow, Central Stoneroller, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Iowa Darter, Johnny Darter, Least Darter, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, White Sucker

Thanks Megan. Any questions please let me know.

**Chris Lorenz, M.Sc.**
Resource Planner
Grand River Conservation Authority
Office: 519-621-2763 ext. 2236

Email: clorenz@grandriver.ca
www.grandriver.ca | Connect with us on social

---

**From:** Megan Olson <molson@slrconsulting.com>
**Sent:** June 20, 2022 3:00 PM
**To:** Chris Lorenz <clorenz@grandriver.ca>
**Cc:** Kim Logan <klogan@slrconsulting.com>
**Subject:** RE: Terms of Reference for Scoped EIS - Dundalk, Ontario

Hi Chris,
Apologies for the delay! I have attached maps for two of the three sites for your reference. The third map will follow in a separate email as I received an undeliverable message from GRCA trying to send all three at once.

Thanks!
Megan

Megan Olson, M.Sc.
Ecologist

C +1 416 333 8279
E molson@slrconsulting.com

SLR Consulting (Canada) Ltd.
300 Town Centre Blvd, Suite 200, Markham, ON L3R 5Z6



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**From:** Chris Lorenz <clorenz@grandriver.ca>
**Sent:** June 14, 2022 10:16 AM
**To:** Megan Olson <molson@slrconsulting.com>
**Subject:** RE: Terms of Reference for Scoped EIS - Dundalk, Ontario



Hi Megan,

I have taken over as resource planner for the north of the watershed and will look after these TORs. I'm hoping you can provide mapping for all three of the TORs you recently provided (2 in Dundalk, 1 in Melancthon) so I can confirm study boundaries.

Thanks,

**Chris Lorenz, M.Sc.**
Resource Planner
Grand River Conservation Authority

Office: 519-621-2763 ext. 2236
Email: clorenz@grandriver.ca
www.grandriver.ca | Connect with us on social

**From:** Megan Olson <molson@slrconsulting.com>
**Sent:** Wednesday, June 8, 2022 11:57 AM
**To:** Laura Warner <lwarner@grandriver.ca>; b.walter@svca.on.ca
**Cc:** Kim Logan <klogan@slrconsulting.com>
**Subject:** Terms of Reference for Scoped EIS - Dundalk, Ontario

Hi Laura and Brandi,
Attached are Terms of Reference for two Scoped Environmental Impact Studies at the following locations:

- 752226, 752240, and 752242 Ida Street, Dundalk, Ontario
- Lots 223, 224, 225, and 226, Concessions 1 and 2 W, Dundalk, Ontario

Both sites fall under the jurisdiction of both GRCA and Saugeen Conservation. Please let me know if you have any questions or concerns with the TOR at this time.

Thanks,
Megan Olson

Megan Olson, M.Sc.
Ecologist

C +1 416 333 8279
E molson@slrconsulting.com

SLR Consulting (Canada) Ltd.
300 Town Centre Blvd, Suite 200, Markham, ON L3R 5Z6

# Appendix B Botanical Inventory

## Environmental Impact Study

**Glenelg Phase 3**

**Flato Developments Inc.**

SLR Project No. 209.30125.00003

May 24, 2023

| GLENELG PHASE 3, DUNDALK, ON | | |
|---|---|---|
| **Common Name** | **Scientific Name** | **SRank[1]** |
| Balsam Fir | *Abies balsamea* | S5 |
| Red Maple | *Acer rubrum* | S5 |
| Sugar Maple | *Acer saccharum* | S5 |
| Canada Anemone | *Anemone canadensis* | S5 |
| Common Lady Fern | *Athyrium filix-femina* | S5 |
| Paper Birch | *Betula papyrifera* | S5 |
| Bladder Sedge | *Carex intumescens* | S5 |
| Retrorse Sedge | *Carex retrorsa* | S5 |
| Fox Sedge | *Carex vulpinoidea* | S5 |
| Red-osier Dogwood | *Cornus sericea* | S5 |
| Wild Carrot | *Daucus carota* | SNA |
| Spinulose Wood Fern | *Dryopteris carthusiana* | S5 |
| Field Horsetail | *Equisetum arvense* | S5 |
| Spotted Joe Pye Weed | *Eutrochium maculatum* | S5 |
| American Beech | *Fagus grandifolia* | S4 |
| White Ash | *Fraxinus americana* | S4 |
| Black Ash | *Fraxinus nigra* | S4 |
| Green Ash | *Fraxinus pennsylvanica* | S4 |
| Fowl Mannagrass | *Glyceria striata* | S5 |
| Spotted Jewelweed | *Impatiens capensis* | S5 |
| American Larch | *Larix laricina* | S5 |
| Garden Bird's-foot Trefoil | *Lotus corniculatus* | SNA |
| Purple Loosestrife | *Lythrum salicaria* | SNA |
| Ostrich Fern | *Matteuccia struthiopteris* | S5 |
| Common Evening Primros | *Oenothera biennis* | S5 |
| Sensitive Fern | *Onoclea sensibilis* | S5 |
| Reed Canary Grass | *Phalaris arundinacea* | S5 |
| Common Timothy | *Phleum pratense* | SNA |
| Common Reed | *Phragmites australis* | SU |
| Balsam Poplar | *Populus balsamifera* | S5 |
| Trembling Aspen | *Populus tremuloides* | S5 |
| Black Cherry | *Prunus serotina* | S5 |
| Choke Cherry | *Prunus virginiana* | S5 |
| Bebb's Willow | *Salix bebbiana* | S5 |
| Pussy Willow | *Salix discolor* | S5 |
| Shining Willow | *Salix lucida* | S5 |
| Dark-green Bulrush | *Scirpus atrovirens* | S5 |
| Cottongrass Bulrush | *Scirpus cyperinus* | S5 |
| Climbing Nightshade | *Solanum dulcamara* | SNA |
| Tall Goldenrod | *Solidago altissima* | S5 |
| Panicled Aster | *Symphyotrichum lanceolatum* | S5 |
| Swamp Aster | *Symphyotrichum puniceum* | S5 |
| Eastern White Cedar | *Thuja occidentalis* | S5 |
| Colt's-foot | *Tussilago farfara* | SNA |
| Broad-leaved Cattail | *Typha latifolia* | S5 |
| American Elm | *Ulmus americana* | S5 |
| Tufted Vetch | *Vicia cracca* | SNA |

[1]**S-Ranks** - Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assignedin a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. **S1** Critically Imperiled—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) **S2** Imperiled—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province. **S3** Vulnerable—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation. **S4** Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors. **S5** Secure—Common, widespread, and abundant in the nation or state/province. **S#S#** Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4). **SX** Apparently extirpated from Ontario, with little likelihood of rediscovery. Typically not seen in the province for many decades, despite searches at known historic sites. **SNA** (Formally SE) Exotic; not believed to be a native component of Ontario's flora.

[2]**SARA** - Species at Risk Act (S.C. 2002, c. 29) Act current to 2022-02-23 and last amended on 2022-02-03.COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

[3]**SARO** - ONTARIO REGULATION 230/08 under the Endangered Species Act, 2007 species at risk in Ontario list. Act current 2022-01-26.

[4]**L Ranks** Toronto and Region Conservation Authority (TRCA). 2017. Scoring and Ranking TRCA's Vegetation Communities, Flora, and Fauna Species.
**L+** Exotic; not native to the TRCA jurisdiction; includes hybrids between a native species and an exotic. **L5** Able to withstand high levels of disturbance; generally secure. **L4** Able to withstand some disturbance; generally secure in rural matrix; of concern in urban matrix.**L3** Able to withstand minor disturbance; generally secure in natural matrix; considered to be of regional concern. **L2** Unable to withstand disturbance; some criteria are very limiting factors; generally occur in high-quality natural areas, in natural matrix; probably rare in the TRCA jurisdiction; of concern regionally. **L1** Unable to withstand disturbance; many criteria are limiting factors; generally occur in high-quality natural areas in natural matrix; almost certainly rare in the TRCA jurisdiction; of concern regional.

# Appendix C Wildlife Observations

## Environmental Impact Study

**Glenelg Phase 3**

**Flato Developments Inc.**

SLR Project No. 209.30125.00003

May 24, 2023

| Common Name | Scientific Name | SRank[1] | SARA[2] COSEWIC | SARO[3] | Highest Breeding Evidence Observed[4] | Comments |
|---|---|---|---|---|---|---|
| **Avifauna** | | | | | | |
| Alder Flycatcher | *Empidonax alnorum* | S5B | | | T | |
| American Crow | *Corvus brachyrhynchos* | S5B,SZN | | | H | |
| American Goldfinch | *Carduelis tristis* | S5B,SZN | | | P | |
| American Redstart | *Setophaga ruticilla* | S5B | | | P | |
| American Robin | *Turdus migratorius* | S5B,SZN | | | CF | |
| American Woodcock | *Scolopax minor* | S4B | | | D | Detected during amphibian breeding surveys |
| **Barn Swallow** | ***Hirundo rustica*** | **S5B,SZN** | **THR SCH 1 SC** | **SC** | NU | |
| Black-and-white Warbler | *Mniotilta varia* | S5B | | | S | |
| Black-capped Chickadee | *Poecile atricapillus* | S5 | | | FY | |
| Blue Jay | *Cyanocitta cristata* | S5 | | | H | |
| Brown-headed Cowbird | *Molothrus ater* | S4B | | | H | |
| Brown Thrasher | *Toxostoma rufum* | S4B | | | S | |
| Cedar Waxwing | *Bombycilla cedrorum* | S5B,SZN | | | H | |
| Chipping Sparrow | *Spizella passerina* | S5B | | | T | |
| Common Grackle | *Quiscalus quiscula* | S5B,SZN | | | CF | |
| Common Yellowthroat | *Geothlypis trichas* | S5B | | | P | |
| Eastern Kingbird | *Tyrannus tyrannus* | S4B | | | T | |
| **Eastern Wood-Pewee** | ***Contopus virens*** | **S4B** | **SC SCH 1 SC** | **SC** | T | |
| European Starling | *Sturnus vulgaris* | SNA | | | S | |
| Gray Catbird | *Dumetella carolinensis* | S4B | | | T | |
| Green Heron | *Butorides virescens* | S4B | | | H | |
| House Wren | *Troglodytes aedon* | S5B,SZN | | | T | |
| Indigo Bunting | *Passerina cyanea* | S4B | | | A | |
| Mallard | *Anas platyrhynchos* | S5 | | | H | |
| Mourning Dove | *Zenaida macroura* | S5 | | | S | |
| Nashville Warbler | *Leiothlypis ruficapilla* | S5B | | | S | |
| Northern Cardinal | *Cardinalis cardinalis* | S5 | | | T | |
| Northern Flicker | *Colaptes auratus* | S4B | | | P | |
| Ovenbird | *Seiurus aurocapilla* | S5B | | | S | |
| Pileated Woodpecker | *Dryocopus pileatus* | S5 | | | H | |
| Pine Warbler | *Setophaga pinus* | S5B | | | T | |
| Purple Finch | *Haemorhous purpureus* | S5 | | | T | |
| Red-breasted Nuthatch | *Sitta canadensis* | S5 | | | H | |
| Red-eyed Vireo | *Vireo olivaceus* | S5B,SZN | | | T | |
| Red-winged Blackbird | *Agelaius phoeniceus* | S4 | | | CF | |
| Rose-breasted Grosbeak | *Pheucticus ludovicianus* | S4 | | | T | |
| Savannah Sparrow | *Passerculus sandwichensis* | S4B | | | T | |
| Sedge Wren | *Cistothorus stellaris* | S4B | | | S | |
| Song Sparrow | *Melospiza melodia* | S5B,SZN | | | CF | |
| Swamp Sparrow | *Melospiza georgiana* | S5B,S4N | | | A | |
| Tree Swallow | *Tachycineta bicolor* | S4B | | | H | |
| Turkey Vulture | *Cathartes aura* | S5B | | | X | |
| Veery | *Catharus fuscescens* | S5B | | | S | |
| Warbling Vireo | *Vireo gilvus* | S5B,SZN | | | T | |
| White-throated Sparrow | *Zonotrichia albicollis* | S5 | | | S | |
| Wild Turkey | *Meleagris gallopavo* | S5 | | | H | |
| Wilson's Snipe | *Gallinago delicata* | S5B | | | D | Detected during amphibian breeding surveys |
| Winter Wren | *Troglodytes hiemalis* | S5B,S4N | | | T | |
| Yellow-bellied Sapsucker | *Sphyrapicus varius* | S5B | | | P | |
| Yellow-rumped Warbler | *Setophaga coronata* | S5B,S4N | | | S | |
| Yellow Warbler | *Setophaga petechia* | S5B | | | CF | |
| **Herptiles** | | | | | | |
| American Toad | *Anaxyrus americanus* | S5 | | | Calling | |
| Gray Treefrog | *Dryophytes versicolor* | S5 | | | Calling | |
| Green Frog | *Lithobates clamitans* | S5 | | | Calling | |
| Northern Leopard Frog | *Lithobates pipiens* | S5 | | | Calling | |
| Spring Peeper | *Pseudacris crucifer* | S5 | | | Calling | |
| **Western Chorus Frog** | ***Pseudacris maculata pop. 1*** | **S4** | **THR SCH 1 THR** | **NAR** | **Calling** | |
| Wood Frog | *Lithobates sylvaticus* | S5 | | | Calling | |
| **Mammals / Other** | | | | | | |
| Chimney Crayfish | *n/a* | n/a | | | Burrows observed | species unknown |
| Coyote | *Canis latrans* | S5 | | | Howling | |
| Muskrat | *Ondatra zibethicus* | S5 | | | Individuals and push-ups observed | |
| White-tailed Deer | *Odocoileus virginianus* | S5 | | | Tracks | |

[1]**S-Ranks** - Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.
**S1** Critically Imperiled—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
**S2** Imperiled—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
**S3** Vulnerable—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
**S4** Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
**S5** Secure—Common, widespread, and abundant in the nation or state/province.
S#S# Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
**SX** Apparently extirpated from Ontario, with little likelihood of rediscovery. Typically not seen in the province for many decades, despite searches at known historic sites.
**SNA** (Formally SE) Exotic; not believed to be a native component of Ontario's flora.

[2]**SARA** - Species at Risk Act (S.C. 2002, c. 29) Act current to 2018-07-05 and last amended on 2018-05-30.

[3]**SARO** - ONTARIO REGULATION 230/08 under the Endangered Species Act, 2007 species at risk in Ontario list. Act current to 2018-08-01. COSEWIC (Committee on the Status of Endangered Wildlife in Canada)
**EXT** Extinct - A species that no longer exists.
**EXP** Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
**END** Endangered - A species facing imminent extirpation or extinction.
**THR** Threatened - A species likely to become endangered if limiting factors are not reversed.
**SC** Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
**NAR** Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
**DD** Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.
* - Species on Schedule 1 of Species At Risk Act (SARA)

[4]**Highest Breeding Evidence Ontario Breeding Bird Atlas: Breeding Evidence Codes**
**X -** Present **XX** - Heard but not expected to be breeding (e.g. using habitat - foraging)
***POSSIBLE***
***H*** *- Species observed in its breeding season in suitable nesting habitat.*
***S*** *- Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.*
***PROBABLE***
**P -** Pair observed in suitable nesting habitat in nesting season
**T -** Permanent terriroty presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place
**D -** Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulations
**V -** Visiting probably nest site
**A** - Agitated behabiour or anxiety calls of an adult
**B -** Brood patch on adult female or cloacal protuberance on adult males
**N -** Nest building or excavation of nest hole
**CONFIRMED**
**DD -** Distraction display or injury feigning **CF -** Adult carrying food for young **NE -** Nest containing eggs
**NY -** Nest with young seen or heard **NU -** Used nest or egg shells found (occupied or laid within the period of the survey) **FY -** Recently fleged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight
**AE -** Adult leaving or entering nest sites in circumstancing indicating occupied nest **FS -** Adult carrying fecal sac

# Appendix D Significant Wildlife Habitat Assessment

## Environmental Impact Study

**Glenelg Phase 3**

**Flato Developments Inc.**

SLR Project No. 209.30125.00003

May 24, 2023

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| **Seasonal Concentration Areas of Animals** | | | | | |
| **Waterfowl Stopover and Staging Areas (Terrestrial)**<br><br>**Rationale**: Habitat important to migrating waterfowl | American Black Duck<br>Wood Duck<br>Green-winged Teal<br>Blue-winged Teal<br>Mallard<br>Northern Pintail<br>Northern Shoveler<br>American Wigeon<br>Gadwall | CUM1<br>CUT1<br><br>Plus evidence of annual spring flooding from meltwater or run-off within these Ecosites. | •Fields with sheet water during Spring (mid-March to May)<br>•Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl<br>•Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available<br><br><u>Information Sources</u><br>•Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence.<br>•Reports and other information available from Conservation Authorities<br>•Sites documented through waterfowl planning processes (eg. EHJV implementation plan)<br>•Field Naturalist Clubs<br>•Ducks Unlimited Canada<br>•Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area | Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”<br>•Any mixed species aggregations of 100 or more individuals required<br>•The flooded field ecosite habitat plus a 100-300m radius, dependent on local site conditions and adjacent land use is the significant wildlife habitat<br>•Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates)<br>•SWH MIST Index #7 provides development effects and mitigation measures | No species or habitat observed; insufficient flooding of fields to provide suitable habitat |
| **Waterfowl Stopover and Staging Areas (Aquatic)**<br><br>**Rationale**: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the ecodistrict. | Canada Goose<br>Cackling Goose<br>Snow Goose<br>American Black Duck<br>Northern Pintail<br>Northern Shoveler<br>American Wigeon<br>Gadwall<br>Green-winged Teal<br>Blue-winged Teal<br>Hooded Merganser<br>Common Merganser<br>Lesser Scaup<br>Greater Scaup<br>Long-tailed Duck<br>Surf Scoter<br>White-winged Scoter<br>Black Scoter<br>Ring-necked duck<br>Common Goldeneye<br>Bufflehead<br>Redhead<br>Ruddy Duck | MAS1<br>MAS2<br>MAS3<br>SAS1<br>SAM1<br>SAF1<br>SWD1<br>SWD2<br>SWD3<br>SWD4<br>SWD5<br>SWD6<br>SWD7 | •Ponds, marshes, lakes, bays, coastal inlets and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify<br>•These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water).<br><br><u>Information Sources</u><br>•Environment Canada<br>•Naturalist clubs often are aware of staging/stopover areas.<br>•OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging.<br>•Sites documented through waterfowl planning processes (e.g., EHJV implementation plan)<br>•Ducks Unlimited projects<br>•Element occurrence specification by Nature Serve: http://www.natureserve.org<br>•Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area | Studies carried out and verified presence of:<br>•Aggregations of 100 or more of listed species for 7 days, results in >700 waterfowl use days<br>•Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH<br>•The combined area of the ELC ecosites and a 100m radius area is the SWH<br>•Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are significant wildlife habitat.<br>•Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”<br>•Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded).<br>•SWH MIST Index #7 provides development effects and mitigation measures | Habitat criteria not met. No large ponds or reservoirs capable of supporting shelter areas as stopovers. |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| **Shorebird Migratory Stopover Area**<br><br>**Rationale**: High quality shorebird stopover habitat is extremely rare and typically has a long history of use. | Greater Yellowlegs<br>Lesser Yellowlegs<br>Marbled Godwit<br>Hudsonian Godwit<br>Black-bellied Plover<br>American Golden-Plover<br>Semipalmated Plover<br>Solitary Sandpiper<br>Spotted Sandpiper<br>Semipalmated Sandpiper<br>Pectoral Sandpiper<br>White-rumped Sandpiper<br>Baird's Sandpiper<br>Least Sandpiper<br>Purple Sandpiper<br>Stilt Sandpiper<br>Short-billed Dowitcher<br>Red-necked Phalarope<br>Whimbrel<br>Ruddy Turnstone<br>Sanderling<br>Dunlin | BBO1<br>BBO2<br>BBS1<br>BBS2<br>BBT1<br>BBT2<br>SDO1<br>SDS2<br>SDT1<br>MAM1<br>MAM2<br>MAM3<br>MAM4<br>MAM5 | •Shorelines of lakes, rivers and wetlands, including beach area, bars and seasonally flooded, muddy and un-vegetated shoreline habitats<br>•Great Lakes coastal shorelines, including groynes and other forms of armor rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October<br>•Sewage treatment ponds and storm water ponds do not qualify as SWH.<br><br><u>Information Sources</u><br>•Western hemisphere shorebird reserve network<br>•Canadian Wildlife Service (CWS) Ontario Shorebird Survey<br>•Bird Studies Canada<br>•Ontario Nature<br>•Local birders and naturalist clubs<br>•Natural Heritage Information Centre (NHIC) Shorebird Migratory Concentration Area | Studies confirming:<br>•Presence of 3 or more of listed species and >1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period)<br>•Whimbrel stop briefly (100 Whimbrel used for 3 years or more is significant.<br>•The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area<br>•Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"<br>•SWH MIST Index #8 provides development effects and mitigation measures | Habitat criteria not met. No lakes, shorelines or coastal areas present |
| **Raptor Wintering Area**<br><br>**Rationale**: Sites used by multiple species, a high number of individuals and used annually are most significant | Rough-legged Hawk<br>Red-tailed Hawk<br>Northern Harrier<br>American Kestrel<br>Snowy Owl<br><br>Special Concern:<br>Short-eared Owl<br>Bald Eagle | Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM, CUT, CUS, CUW.<br><br>Bald Eagle: Forest Community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area). | •The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors<br>•Raptor wintering (hawk/owl) sites need to be >20 ha with a combination of forest and upland<br>•Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands<br>•Field area of the habitat is to be wind swept with limited snow depth or accumulation.<br>•Eagle sites have open water and large trees and snags available for roosting<br><br><u>Information Sources</u><br>•OMNRF Ecologist or Biologist<br>•Naturalist clubs<br>•Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area<br>•Data from Bird Studies Canada<br>•Results of Christmas Bird Counts<br>•Reports and other information available from Conservation Authorities | Studies confirm the use of these habitats by:<br>•One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species<br>•To be significant a site must be used regularly (3 in 5 years) cxlix for a minimum of 20 days by the above number of birds<br>•The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area<br>•Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"<br>•SWH MIST Index #10 and #11 provides development effects and mitigation measures. | Habitat criteria not met. Woodland and meadow within site do not meet size criteria. |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| **Bat Hibernacula**<br><br>**Rationale**: Bat hibernacula are rare habitats in all Ontario landscapes. | Big Brown Bat<br>Tri-colored Bat | Bat Hibernacula may be found in these ecosites: CCR1<br>CCR1<br>CCR2<br>CCA1<br>CCA2<br><br>(Note: buildings are not considered SWH) | •Hibernacula may be found in caves, mine shafts, underground foundations and Karsts<br>•Active mine sites should not be considered as SWH<br>•The locations of Bat Hibernacula are relatively poorly known<br><br><u>Information Sources</u><br>•OMNRF for possible locations and contact for local experts<br>•Natural Heritage Information Centre (NHIC) Bat Hibernaculum<br>•Ministry of Northern Development and Mines for location of mine shafts<br>•Clubs that explore caves (eg. Sierra Club)<br>•University Biology Departments with bat experts | •All sites with confirmed hibernating bats are SWH<br>•The area includes 200 m radius around the entrance of the hibernaculum for most development types and 1000 m for wind farms<br>•Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"<br>•SWH MIST Index #1 provides development effects and mitigation measures. | Habitat criteria not met. No known Karst, escarpment areas or rock features (caves). |
| **Bat Maternity Colonies**<br><br>**Rationale**: Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes | Big Brown Bat<br>Silver-haired Bat | Maternity colonies considered SWH are found in forested Ecosites.<br><br>All ELC Ecosites in ELC Community Series: FOD, FOM, SWD, SWM | •Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH).<br>•Maternity roosts are not found in caves and mines in Ontario<br>•Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees<br>•Female bats prefer wildlife trees (snags) in early stages if decay, class 1-3 or class 1 or 2<br>•Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred<br><br><u>Information Sources</u><br>•OMNRF for possible locations and contact for local experts<br>•University Biology Departments with bat experts | •Maternity colonies with confirmed use by:<br>o>10 Big Brown Bats<br>o>5 adult female Silver-haired Bats<br>•The area of habitat includes the entire woodland or a forest stand ELC Ecosite or an Eco-element containing the maternity colonies<br>•Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"<br>•SWH MIST Index #12 provides the development effects and mitigation measures | **Candidate**<br>Woodlands within and adjacent to site provide suitable habitat. |
| **Turtle Wintering Areas**<br><br>**Rationale**: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant | Midland Painted Turtle<br><br>Special Concern:<br>Northern Map Turtle<br>Snapping Turtle | Snapping and Midland Painted Turtles: SW, MA, OA and SA; FEO and BOO.<br><br>Northern Map Turtle: Open water areas such as deeper rivers or streams and lakes with current can also be used as overwintering habitat. | •For most turtles, wintering areas are in the same general areas as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates.<br>•Overwintering sites are permanent water bodies, large wetlands and bots or fens with adequate dissolved oxygen.<br>•Manmade ponds such as sewage lagoons or storm water ponds should not be considered SWH.<br><br><u>Information Sources</u><br>•EIA/EIS studies carried out by conservation authorities.<br>•Field naturalists clubs/ university herpetologists.<br>•OMNRF ecologist or biologist<br>•NHIC | •Presence of five overwintering Midland Painted Turtles is significant.<br>•One or more Northern Map Turtle or Snapping Turtle overwintering within a wetland is significant.<br>•The mapped ELC ecosite area with the overwintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are overwintering is the SWH.<br>•Overwintering areas may be identified by searching for congregations (basking areas) of turtles on warm, sunny days during the fall (September to October) or spring (March to May)<br>•Congregation of turtles is more common where wintering areas are limited and therefore significant | No suitable open water habitat present on site. |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| | | | | •SWH MIST Index #28 provides development effects and mitigation measures for turtle wintering habitat | |
| **Reptile Hibernaculum**<br><br>**Rationale**: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant | Snakes:<br>Eastern Gartersnake<br>Northern Watersnake<br>Northern Red-bellied Snake<br>Northern Brownsnake<br>Smooth Green Snake<br>Northern Ring-necked Snake<br><br>Special Concern:<br>Milksnake Eastern Ribbonsnake<br><br>Lizard<br>Special Concern:<br>Five-lined Skink (Southern Shield population) | For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats.<br><br>Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator | •For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH.<br>•Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line<br>•Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover<br>•Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures<br><br><u>Information Sources</u><br>•In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells).<br>•Reports and other information available from Conservation Authorities.<br>•Field Naturalist Clubs<br>•University herpetologists<br>•NHIC<br>•OMNRF ecologist or biologist may be aware of locations of wintering skinks | Studies confirming:<br>•Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp.<br>•Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)<br>•NOTE: If there are Special Concern Species present, then site is SWH<br>•NOTE: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula.<br>•The feature in which the hibernacula is located plus a 30 m radius area is the SWH<br>•SWH MIST Index #13 provides development effects and mitigation measures for snake hibernacula<br>• Presence of any active hibernaculum for skink is significant.<br>•SWH MIST Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat. | Habitat is not present. No features assessed on site occur with potential to penetrate deep below the frost line. |
| **Colonially -Nesting Bird Breeding Habitat (Bank and Cliff)**<br><br>**Rationale**:<br>Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population | Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies) | Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites:<br>CUM1<br>CUT1<br>CUS1<br>BLO1<br>BLS1<br>BLT1<br>CLO1<br>CLS1<br>CLT1 | •Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area<br>•Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles<br>•Does not include a licensed/permitted Mineral Aggregate Operation.<br><br><u>Information Sources</u><br>•Reports and other information available from Conservation Authorities<br>•Ontario Breeding Bird Atlas<br>•Bird Studies Canada; NatureCounts http://www.birdscanada.org/birdmon | Studies confirming:<br>•Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season.<br>•A colony identified as SWH will include a 50m radius habitat area from the peripheral nests<br>•Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”<br>•SWH MIST Index #4 provides development effects and mitigation measures. | Habitat criteria not met. No exposed banks observed on site or immediately adjacent. |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| are declining in Ontario. | | | •Field Naturalist Clubs | | |
| **Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs)**<br><br>**Rationale**: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually. | Great Blue Heron<br>Black-crowned Night Heron<br>Great Egret<br>Green Heron | SWM2<br>SWM3<br>SWM5<br>SWM6<br>SWD1<br>SWD2<br>SWD3<br>SWD4<br>SWD5<br>SWD6<br>SWD7<br>FET1 | •Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.<br>•Most nests in trees are 11 to 15 m from ground, near the top of the tree.<br><br><u>Information Sources</u><br>•Ontario Breeding Bird Atlas colonial nest records.<br>•Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF).<br>•Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony<br>•Aerial photographs can help identify large heronries.<br>•Reports and other information available from Conservation Authorities.<br>•MNRF District Offices<br>•Field Naturalist Clubs | Studies confirming:<br>•Presence of 5 or more active nests of Great Blue Heron or other listed species.<br>• The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH.<br>•Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells.<br>•SWH MIST Index #5 provides development effects and mitigation measures. | Habitat criteria not met. No stick nests observed or evidence of nest structures by herons in proximity to the Site. |
| **Colonially -Nesting Bird Breeding Habitat (Ground)**<br><br>**Rationale**: Colonies are important to local bird population, typically sites are only known colony in area and are used annually. | Herring Gull<br>Great Black-backed Gull<br>Little Gull<br>Ring-billed Gull<br>Common Tern<br>Caspian Tern<br>Brewer's Blackbird | Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird)<br><br>MAM1 – 6<br>MAS1 – 3<br>CUM<br>CUT<br>CUS | •Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas.<br>•Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands.<br><br><u>Information Sources</u><br>•Ontario Breeding Bird Atlas, rare/colonial species records.<br>•Canadian Wildlife Service<br>•Reports and other information available from Conservation Authorities<br>•Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area<br>•MNRF District Offices<br>•Field Naturalist Clubs | Studies confirming:<br>•Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern<br>•Presence of 5 or more pairs for Brewer's Blackbird<br>•Any active nesting colony of one or more Little Gull, and Great Black backed Gull is significant<br>•The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH<br>• Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"<br>• SWH MIST Index #6 provides development effects and mitigation measures | Habitat criteria not met. No exposed rocks or island peninsulas; Brewer's Blackbird not observed on or adjacent to site |
| **Migratory Butterfly Stopover Areas**<br><br>**Rationale**: Butterfly stopover areas are extremely rare habitats and are | Painted Lady<br>Red Admiral<br><br>Special Concern:<br>Monarch | Combination of ELC Community Series; need to have present one Community Series from each landclass:<br><br>FIELD: CUM, CUT, CUS<br>FOREST: FOC, FOD, FOM, CUP | •A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Erie or Lake Ontario<br>•The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south | Studies confirm:<br>•The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days the site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between | Habitat criteria not met. Site not within 5 km of Lake Ontario. |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| biologically important for butterfly species that migrate south for the winter. | | Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed. | •The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat<br>•Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes<br><br><u>Information Sources</u><br>• NHIC<br>•Agriculture Canada in Ottawa may have list of butterfly experts<br>•Field Naturalist Clubs<br>•Toronto Entomologists Association<br>•Conservation Authorities | years and multiple years of sampling should occur<br>•Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD.<br>•MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.<br>•SWH MIST Index #16 provides development effects and mitigation measures. | |
| **Landbird Migratory Stopover Areas**<br><br>**Rationale**: Sites with a high diversity of species as well as high numbers are most significant. | All migratory songbirds<br><br>Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1<br><br>All migrant raptor species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors) | All Ecosites associated with these ELC Community Series:<br>FOC<br>FOM<br>FOD<br>SWC<br>SWM<br>SWD | •Woodlots >10 ha in size and within 5 km of Lake Ontario.<br>•If woodlands are rare in an area of shoreline, woodland fragments 2-5 ha can be considered for this habitat<br>•If multiple woodlands are located along the shoreline those woodlands <2 km from Lake Ontario are more significant<br>•Sites have a variety of habitats: forest, grassland and wetland complexes<br>•The largest sites are more significant<br>•Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and within 5 km of Lake Ontario are Candidate SWH<br><br><u>Information Sources</u><br>•Bird Studies Canada<br>•Ontario Nature<br>•Local birders and field naturalist clubs<br>•Ontario Important Bird Areas (IBA) Program | Studies confirm:<br>•Use of the habitat by >200 birds/day and with >35 species and with at least 10 bird species recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant.<br>•Studies should be completed during spring (Mar.-May) and fall (Aug.- Oct.) migration using standardized assessment techniques. Evaluation to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".<br>•SWH MIST Index #9 provides development effects and mitigation measures. | Habitat criteria not met. Site not within 5 km of Lake Ontario. |
| **Deer Yarding Areas**<br><br>**Rationale:**<br>Winter habitat for deer is considered to be the main limiting factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically | White-tailed Deer | Note: OMNRF to determine this habitat.<br><br>ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC.<br><br>Or these ELC Ecosites;<br>CUP2<br>CUP3<br>FOD3<br>CUT | •Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioral response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. | No Studies Required:<br>• Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH.<br>• Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO).<br>• Field investigations that record deer tracks in winter are done to confirm use (best done from an | Not mapped by MNRF. |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range. | | | • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%.<br>• OMNRF determines deer yards following methods outlined in “Selected Wildlife and Habitat Features: Inventory Manual"<br>•Woodlots with high densities of deer due to artificial feeding are not significant | aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations. cxcv<br>• If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule.<br>• SWH MIST Index #2 provides development effects and mitigation measures. | |
| **Deer Winter Congregation Areas**<br><br>**Rationale**: Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions | White-tailed Deer | All forested Ecosites with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD<br><br>Conifer plantations much smaller than 50 ha may also be used. | •Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment.<br>• Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands.<br>• If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule.<br>• Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha.<br>• Woodlots with high densities of deer due to artificial feeding are not significant.<br><br><u>Information Sources</u><br>•MNRF District Offices<br>•LIO/NRVIS | Studies confirm:<br>•Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF.<br>•Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF.<br>•Studies should be completed during winter (Jan./Feb.) when >20 cm of snow is on the ground using aerial survey techniques, ground road surveys, or a pellet count deer density survey.<br>•Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule.<br>•SWH MIST Index #2 provides development effects and mitigation measures. | Not mapped by MNRF. |
| **Rare Vegetation Communities** | | | | | |
| **Cliffs and Talus Slopes**<br><br>**Rationale**: Cliffs and Talus Slopes are extremely rare habitats in Ontario. | Any ELC Ecosite within Community Series:<br>TAO<br>TAS<br>TAT<br>CLO<br>CLS<br>CLT | A Cliff is vertical to near vertical bedrock >3 m in height.<br><br>A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. | •Most cliff and talus slopes occur along the Niagara Escarpment<br><br><u>Information Sources</u><br>•The Niagara Escarpment Commission has detailed information on location of these habitats<br>•OMNRF Districts<br>•Natural Heritage Information Centre (NHIC) has location information available on their website<br>•Field Naturalist Clubs<br>•Conservation Authorities | •Confirm any ELC Vegetation Type for Cliffs or Talus Slopes<br>•SWH MIST Index #21 provides development effects and mitigation measures | Habitat criteria not met– no cliffs or talus areas present within or adjacent to site |
| **Sand Barren** | ELC Ecosites:<br>SBO1<br>SBS1 | Sand barrens typically are exposed sand, generally sparsely vegetated and caused by a lack of moisture, | •A sand barren area >0.5 ha in size<br><br><u>Information Sources</u> | •Confirm any ELC Vegetation Type for Sand Barrens<br>•Site must not be dominated by exotic or introduced species (<50% | Habitat criteria not met– none present within or adjacent to site |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| **Rationale**: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry. | SBT1<br><br>Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60% | periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%. | •OMNRF Districts<br>•Natural Heritage Information Centre (NHIC) has location information available on their website<br>•Field Naturalist Clubs<br>•Conservation Authorities | vegetative cover are exotic spp.)<br>•SWH MIST Index #20 provides development effects and mitigation<br>measures | |
| **Alvar**<br><br>**Rationale**: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregions 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact. | ALO1<br>ALS1<br>ALT1<br>FOC1<br>FOC2<br>CUM2<br>CUS2<br>CUT2-1<br>CUW2<br><br>**Five Alvar Indicator Species**:<br>*Carex crawei*<br>*Panicum philadelphicum*<br>*Eleocharis compressa*<br>*Scutellaria parvula*<br>*Trichostema brachiatum*<br>These indicator species are very specific to Alvars within Ecoregion 6E | An Alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover | •An Alvar site >0.5 ha in size<br><br>Information Sources<br>•Alvars of Ontario (Federation of Ontario Naturalists, 2000)<br>•Conserving Great Lakes Alvars (Ontario Nature)<br>•OMNRF Districts<br>•Natural Heritage Information Centre (NHIC) has location information available on their website<br>•Field Naturalist Clubs<br>•Conservation Authorities | •Field studies identify that four of the five Alvar Indicator Species at a Candidate Alvar Site is significant<br>•Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.)<br>•The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses<br>•SWH MIST Index #17 provides development effects and mitigation<br>measures | Habitat criteria not met–none present within or adjacent to site |
| **Old Growth Forest**<br><br>**Rationale**:<br>Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species. | Forest Community Series:<br>FOD<br>FOC<br>FOM<br>SWD<br>SWC<br>SWM | Old Growth Forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multilayered canopy and an abundance of snags and downed woody debris. | Woodland areas 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest<br><br>Information Sources<br>•OMNRF Forest Resource Inventory mapping<br>•OMNRF Districts<br>•Field Naturalist Clubs<br>•Conservation Authorities<br>•Sustainable Forestry License (SFL) companies will possibly know locations through field operations<br>•Municipal forestry departments | Field studies will determine:<br>•If dominant tree species of the forest are >140 years old, then the area containing these trees is SWH<br>•The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present)<br>•The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH<br>•Determine ELC vegetation types for the forest area containing the old growth characteristics<br>•SWH MIST Index #23 provides development effects and mitigation measures | Habitat criteria not met–none present within or adjacent to site |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| **Savannah**<br><br>**Rationale**: Savannahs are extremely rare habitats in Ontario. | TPS1<br>TPS2<br>TPW1<br>TPW2<br>CUS2 | A Savannah is a tallgrass prairie habitat that has tree cover between 25-60%. | •No minimum size to site<br>•Site must be restored or a natural site. Remnant sites such as railway right-of ways are not considered SWH<br><br><u>Information Sources</u><br>•Natural Heritage Information Centre (NHIC) has location information available on their website<br>•Field Naturalist Clubs<br>•Conservation Authorities | Field studies confirm:<br>•One or more of the Savannah indicator species listed in Appendix N should be present. Note: savannah plant spp. List from Ecoregion 6E should be used.<br>•Area of the ELC Ecosite is the SWH<br>•Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.)<br>•SWH MIST Index #18 provides development effects and mitigation measures | Habitat criteria not met– none present within or adjacent to site |
| **Tallgrass Prairie**<br><br>**Rationale**: Tallgrass Prairies are extremely rare habitats in Ontario. | TPO1<br>TPO2 | A tallgrass prairie has ground cover dominated by prairie grasses. An open tallgrass prairie habitat has <25% tree cover. | •No minimum size to site<br>•Site must be restored or a natural site. Remnant sites such as railway right-of ways are not considered SWH<br><br><u>Information Sources</u><br>•Natural Heritage Information Centre (NHIC) has location information available on their website<br>•OMNRF Districts<br>•Field Naturalist Clubs<br>•Conservation Authorities | Field studies confirm:<br>•One or more of the Prairie indicator species listed in Appendix N should be present. Note: savannah plant spp. List from Ecoregion 6E should be used.<br>•Area of the ELC Ecosite is the SWH<br>•Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.)<br>•SWH MIST Index #19 provides development effects and mitigation measures | Habitat criteria not met– none present within or adjacent to site |
| **Other Rare Vegetation Communities**<br><br>**Rationale**: Plant communities that often contain rare species which depend on the habitat for survival. | Provincially rare (S1, S2, S3) vegetation communities are listed in Appendix M of the Significant Wildlife Habitat Technical Guide (MNRF, 2000). Any ELC Ecosite Code that has a possible ELC Vegetation Type that is provincially rare is candidate SWH. | Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps. | •ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M of the Significant Wildlife Habitat Technical Guide (MNRF, 2000).<br>•OMNRF/NHIC will have up to date listing for rare vegetation communities.<br><br><u>Information Sources</u><br>•Natural Heritage Information Centre (NHIC) has location information available on their website<br>•OMNRF Districts<br>•Field Naturalist Clubs<br>•Conservation Authorities | •Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of the Significant Wildlife Habitat Technical Guide (MNRF, 2000).<br>•Area of the ELC Vegetation Type polygon is the SWH.<br>•SWH MIST Index #37 provides development effects and mitigation measures | Habitat criteria not met– none observed during numerous site visits conducted. |
| **Specialized Habitat for Wildlife** | | | | | |
| **Waterfowl Nesting Area**<br><br>**Rationale**: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant. | American Black Duck<br>Northern Pintail<br>Northern Shoveler<br>Gadwall<br>Blue-winged Teal<br>Green-winged Teal<br>Wood Duck<br>Hooded Merganser<br>Mallard | All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4<br><br>Note: Includes adjacency to Provincially Significant Wetlands | • Waterfowl nesting area extends 120 m cxlix from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur.<br>•Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests.<br>•Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites | Studies confirmed:<br>•Presence of 3 or more nesting pairs for listed species excluding Mallards, or;<br>•Presence of 10 or more nesting pairs for listed species including Mallards.<br>•Any active nesting site of an American Black Duck is considered significant.<br>•Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” | criteria not met. Species and abundance thresholds not observed during field investigations |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| | | | Information Sources<br>•Ducks Unlimited staff may know the locations of particularly productive nesting sites<br>•MNRF Wetland Evaluations for indication of significant waterfowl nesting habitat<br>•Reports and other information available from Conservation Authorities | •A field study confirming waterfowl nesting habitat will determine boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest<br>•SWH MIST Index #25 provides development effects and mitigation measures. | |
| **Bald Eagle and Osprey Nesting, Foraging and Perching Habitat**<br><br>**Rationale**: Nest sites are fairly uncommon in Eco - region 7E and are used annually by the se species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat. | Osprey<br><br>Special Concern:<br>Bald Eagle | ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands. | •Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.<br>•Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy.<br>•Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms)<br><br>Information Sources<br>•NHIC compiles all known nesting sites for Bald Eagles in Ontario<br>•MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat<br>•Nature Counts, Ontario Nest Records Scheme data.<br>•OMNRF District<br>•Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented<br>•Reports and other information available from Conservation Authorities.<br>•Field Naturalists clubs | Studies confirm the use of these nests by:<br>•One or more active Osprey or Bald Eagle nests in an area<br>•Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH.<br>•For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important<br>•For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800 m is dependent on sight lines from the nest to the development and inclusion of perching and foraging habitat<br>•To be significant a site must be used annually. When found inactive, the site must be known to be inactive for > 3 years or suspected of not being used for >5 years before being considered not significant.<br>•Observational studies to determine nest site use, perching sites and foraging areas need to be done from early March to mid-August.<br>•Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"<br>•SWH MIST Index #26 provides development effects and mitigation measures | Habitat criteria not met. No stick nets or target species observed during numerous site visits conducted. |
| **Woodland Raptor Nesting Habitat**<br><br>**Rationale**: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species. | Northern Goshawk<br>Cooper's Hawk<br>Sharp-shinned Hawk<br>Red-shouldered Hawk<br>Barred Owl<br>Broad-winged Hawk | May be found in all forested ELC Ecosites.<br><br>May also be found in SWC, SWM, SWD and CUP3. | •All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat. Interior habitat determined with a 200m buffer.<br>•Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands.<br>•In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. | Studies confirm:<br>•Presence of 1 or more active nests from species list is considered significant<br>•Red-shouldered Hawk and Northern Goshawk – A 400 m radius around the nest or 28 ha area of habitat is the SWH. (The 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest).<br>•Barred Owl – A 200m radius around the nest is the SWH | Habitat criteria not met. Woodland associated with site is not > 30 ha with >4ha of interior habitat. |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| | | | Information Sources<br>•OMNRF Districts<br>•Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented<br>•Check data from Bird Studies Canada<br>•Reports and other information available from Conservation Authorities | •Broad-winged Hawk and Coopers Hawk, – A 100m radius around the nest is the SWH<br>•Sharp-Shinned Hawk – A 50m radius around the nest is the SWH<br>•Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area.<br>•SWH MIST Index #27 provides development effects and mitigation measures | |
| **Turtle Nesting Areas**<br><br>**Rationale**: These habitats are rare and when identified will often be the only breeding site for local populations of turtles | Midland Painted Turtle<br><br>Special Concern:<br>Northern Map Turtle<br>Snapping Turtle | Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, BOO1, FEO1 | •Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals.<br>•For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and is located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH.<br>•Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes and rivers are most frequently used.<br><br>Information Sources<br>•Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels)<br>•Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them<br>•Natural Heritage Information Centre (NHIC)<br>•Field naturalist clubs | Studies confirm:<br>•Presence of 5 or more nesting Midland Painted Turtles.<br>•1 or more Northern Map Turtle or Snapping Turtle nesting is a SWH.<br>•The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30 to 100 m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH.<br>•Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30 to 100 m area of habitat.<br>•Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method.<br>•SWH MIST Index #28 provides development effects and mitigation measures for turtle nesting habitat. | Suitable nesting habitat and species not observed during field investigations |
| **Seeps and Springs**<br><br>**Rationale**:<br>Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams. | Wild Turkey<br>Ruffed Grouse<br>Spruce Grouse<br>White-tailed Deer<br>Salamanders | Seeps/springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs. | •Any forested area (with <25% meadow/field/ pasture) within the headwaters of a stream or river system<br>•Seeps and springs are important feeding and drinking areas. Especially in the winter will support a variety of plant and animal species.<br><br>Information Sources<br>•Topographical Map<br>•Thermography<br>•Hydrological surveys conducted by Conservation Authorities and MECP | Studies confirm:<br>•Presence of a site with 2 or more seeps/springs should be considered SWH.<br>• The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat cxlviii.<br>• SWH MIST Index #30 provides development effects and mitigation measures | Habitat criteria not met. Not observed during field evaluations. |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| | | | •Field Naturalists Clubs and landowners<br>•Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped | | |
| **Amphibian Breeding Habitat (Woodland)**<br><br>**Rationale**: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations | Eastern Newt<br>Blue-spotted Salamander<br>Spotted Salamander<br>Gray Treefrog<br>Spring Peeper<br>Western Chorus Frog<br>Wood Frog | All Ecosites associated with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD<br><br>Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians. | •Presence of a wetland, pond or woodland pool (including vernal pools) >500 m2 (about 25 m diameter) within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians.<br>•Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.<br><br><u>Information Sources</u><br>•Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records<br>•Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property.<br>•OMNRF Districts and wetland evaluations<br>•Field Naturalist clubs<br>•Canadian Wildlife Service Amphibian Road Call Survey<br>•Ontario Vernal Pool Association: http://www.ontariovernalpools.org | Studies confirm:<br>•Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or egg masses) or 2 or more of the listed frog species with Call Level Codes of 3.<br>•A combination of observational study and call count surveys will be required during the spring (Mar.-Jun.) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands<br>•The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat.<br>•SWH MIST Index #14 provides development effects and mitigation measures | Species and abundance thresholds not met during field investigations |
| **Amphibian Breeding Habitat (Wetlands)**<br><br>**Rationale**: Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes. | Eastern Newt<br>American Toad<br>Spotted Salamander<br>Four-toed Salamander<br>Blue-spotted Salamander<br>Gray Treefrog<br>Western Chorus Frog<br>Northern Leopard Frog<br>Pickerel Frog<br>Green Frog<br>Mink Frog<br>Bullfrog | ELC Community Classes SW, MA, FE, BO, OA and SA.<br><br>Typically these wetland ecosites will be isolated (>120 m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bullfrog) may be adjacent to woodlands. | •Wetlands >500m2 (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats<br>•Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators<br>•Bullfrogs require permanent water bodies with abundant emergent vegetation.<br><br><u>Information Sources</u><br>•Ontario Herpetofaunal Summary Atlas (or other similar atlases)<br>•Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count.<br>•OMNRF Districts and wetland evaluations.<br>•Reports and other information available from Conservation Authorities | Studies confirm:<br>•Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3 or; Wetland with confirmed breeding Bullfrogs are significant<br>•The ELC ecosite wetland area and the shoreline are the SWH<br>•A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands.<br>•If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule.<br>•SWH MIST Index #15 provides development effects and mitigation measures | **Confirmed**<br>Species and abundance thresholds met during field investigations |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| **Woodland Area - Sensitive Bird Breeding Habitat Rationale**: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds | Yellow-bellied Sapsucker<br>Red-breasted Nuthatch<br>Veery<br>Blue-headed Vireo<br>Northern Parula<br>Black-throated Green Warbler<br>Blackburnian Warbler<br>Black-throated Blue Warbler<br>Ovenbird<br>Scarlet Tanager<br>Winter Wren<br><br>Special Concern:<br>Cerulean Warbler<br>Canada Warbler | All Ecosites associated with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD | •Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha<br>•Interior forest habitat is at least 200 m from forest edge habitat<br><br><u>Information Sources</u>:<br>•Local birder clubs<br>•Canadian Wildlife Service (CWS) for the location of forest bird monitoring<br>•Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species<br>•Reports and other information available from Conservation Authorities. | Studies confirm:<br>•Presence of nesting or breeding pairs of 3 or more of the listed wildlife species.<br>•Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH<br>•Conduct field investigations in spring and early summer when birds are singing and defending their territories<br>•Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”<br>•SWH MIST Index #34 provides development effects and mitigation measures | **Confirmed**<br>Site investigations identified 5 of the listed species presumed to be breeding within woodlands associated with the site |
| **Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)** | | | | | |
| **Marsh Breeding Bird Habitat**<br><br>**Rationale**: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes. | American Bittern<br>Virginia Rail<br>Sora<br>Common Moorhen<br>American Coot<br>Pied-billed Grebe<br>Marsh Wren<br>Sedge Wren<br>Common Loon<br>Sandhill Crane<br>Green Heron<br>Trumpeter Swan<br><br>Special Concern:<br>Black Tern<br>Yellow Rail | MAM1<br>MAM2<br>MAM3<br>MAM4<br>MAM5<br>MAM6<br>SAS1<br>SAM1<br>SAF1<br>FEO1<br>BOO1<br><br>For Green Heron: all SW, MA and CUM1 sites | •Nesting occurs in wetlands.<br>•All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present<br>•For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water<br><br><u>Information Sources</u><br>•OMNRF District and wetland evaluations<br>•Field Naturalist clubs<br>•Natural Heritage Information Centre (NHIC) Records<br>•Reports and other information available from Conservation Authorities<br>•Ontario Breeding Bird Atlas | Studies confirm:<br>• Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species<br>• Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH<br>• Area of the ELC ecosite is the SWH.<br>• Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats.<br>• Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”<br>• SWH MIST Index #35 provides development effects and mitigation measures | Species and abundance thresholds not met during field investigations |
| **Open Country Bird Breeding Habitat**<br><br>**Rationale:** This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland | Upland Sandpiper<br>Grasshopper Sparrow<br>Vesper Sparrow<br>Northern Harrier<br>Savannah Sparrow<br><br>Special Concern:<br>Short-eared Owl | CUM1<br>CUM2 | •Large grassland areas (includes natural and cultural fields and meadows) >30 ha<br>•Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)<br>•Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. | Field studies confirm:<br>•Presence of nesting or breeding of 2 or more of the listed species<br>•A field with 1 or more breeding Short-eared Owls is to be considered SWH<br>•The area of SWH is the contiguous ELC ecosite field areas | Habitat criteria not met. Large areas of grassland or meadow (>30 ha) not present |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records | | | •The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species<br><br><u>Information Sources</u><br>•Agricultural land classification maps, Ministry of Agriculture<br>•Local bird clubs<br>•Ontario Breeding Bird Atlas<br>•EIA/EIS Reports and other information available from Conservation Authorities | •Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories<br>•Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"<br>•SWH MIST Index #32 provides development effects and mitigation measures | |
| **Shrub/Early Successional Bird Breeding Habitat**<br><br>**Rationale:** This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records. | Indicator Species:<br>Brown Thrasher<br>Clay-colored Sparrow<br><br>Common Species:<br>Field Sparrow<br>Black-billed Cuckoo<br>Eastern Towhee<br>Willow Flycatcher<br><br>Special Concern:<br>Yellow-breasted Chat<br>Golden-winged Warbler | CUT1, CUT2, CUS1, CUS2, CUW1, CUW2<br><br>Patches of shrub ecosites can be complexed into a larger habitat for some bird species | •Large field areas succeeding to shrub and thicket habitats >10 ha in size<br>•Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)<br>•Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species<br>•Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands<br><br><u>Information Sources</u><br>•Agricultural land classification maps, Ministry of Agriculture<br>•Local bird clubs<br>•Ontario Breeding Bird Atlas<br>•Reports and other information available from Conservation Authorities | Field studies confirm:<br>•Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species<br>•A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as SWH<br>•The area of the SWH is the contiguous ELC ecosite field/thicket area.<br>•Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories<br>•Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"<br>•SWH MIST Index #33 provides development effects and mitigation measures | Habitat criteria not met. Large areas of thicket or shrub habitat (>10 ha) not present |
| **Terrestrial Crayfish**<br><br>**Rationale**: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. | Chimney or Digger Crayfish; (*Fallicambarus fodiens* )<br><br>Devil Crayfish or Meadow Crayfish; (*Cambarus diogenes* ) | MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT, SWM<br><br>CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish | •Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish<br>•Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water<br>•Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well-formed.<br><br><u>Information Sources</u><br>•Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF, March, 1998 | Studies confirm:<br>•Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites<br>•Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH<br>•Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult<br>•SWH MIST Index #36 provides development effects and mitigation measures | **Confirmed**<br>Species and habitat observed during field investigations |
| **Special Concern and Rare Wildlife Species** | All Special Concern and Provincially Rare (S1, S2, S3, SH) plant and animal species. Lists of these | All plant and animal element occurrences (EOs) within a 1 km or 10 km grid. | •When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites | Studies confirm:<br>•Assessment/inventory of the site for the identified special concern or rare species needs to be | **Confirmed**<br>Several Eastern Wood-pewee territories identified |

| Ecoregion 6E Wildlife Habitat | Wildlife Species | Candidate SWH | | Confirmed SWH | Assessment of Habitat in EIA Study Area |
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| | | ELC Ecosite Codes | Habitat Criteria and Information Source | Defining Criteria | |
| **Rationale**: These species are quite rare or have experienced significant population declines in Ontario. | species are tracked by the NHIC. | Older EOs were recorded prior to GPS being available, therefore location information may lack accuracy. | <u>Information Sources</u><br>•Natural Heritage Information Centre (NHIC) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data<br>•NHIC Website "Get Information": http://nhic.mnr.gov.on.ca<br>•Ontario Breeding Bird Atlas<br>•Expert advice should be sought as many of the rare spp. Have little information available about their requirement | completed during the time of year when the species is present or easily identifiable.<br>•The area of the habitat to the finest ELC scale that protects the habitat features and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat.<br>•SWH MIST Index #37 provides development effects and mitigation measures | in woodland associated with the site |
| **Animal Movement Corridors** | | | | | |
| **Amphibian Movement Corridors**<br><br>**Rationale**: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations. | Eastern Newt<br>American Toad<br>Spotted Salamander<br>Four-toed Salamander<br>Blue-spotted Salamander<br>Gray Treefrog<br>Western Chorus Frog<br>Northern Leopard Frog<br>Pickerel Frog<br>Green Frog<br>Mink Frog<br>Bullfrog | Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1 | •Movement corridors between breeding habitat and summer habitat<br>•Movement corridors must be determined when **Amphibian Breeding Habitat** is confirmed as SWH (Amphibian Breeding Habitat, Wetland)<br><br><u>Information Sources</u><br>•MNRF District Office<br>•Natural Heritage Information Centre (NHIC)<br>•Reports and other information available from Conservation Authorities<br>•Field Naturalist Clubs | •Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites<br>•Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant<br>•Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps<20m<br>• Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat<br>• SWH MISTIndex #40 provides development effects and mitigation measures | While frogs may disperse from and within the wetlands, the development is proposed within area not suitable for dispersal (active agriculture) and would not impede the movement of amphibians within and between the significant breeding habitat and other wetlands as these are all connected via offsite features |
| **Deer Movement Corridors**<br><br>**Rationale:** Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling. | White-tailed Deer | Corridors may be found in all forested ecosites.<br>A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors. | •Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule<br>•A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion<br>•Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges)<br><br><u>Information Sources:</u><br>•MNRF District Office<br>•Natural Heritage Information Center (NHIC)<br>•Reports and other information available from Conservation Authorities.<br>•Field Naturalist Clubs | •Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas<br>• Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas.<br>• Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m of vegetation on both sides of waterway. Shorter corridors are more significant than longer corridors.<br>• SWH MIST Index #39 provides development effects and mitigation measures | Not applicable as Deer Wintering Habitat was not identified |

# Appendix E Terms of Reference for Additional Studies

## Environmental Impact Study

**Glenelg Phase 3**

**Flato Developments Inc.**

SLR Project No. 209.30125.00003

May 24, 2023

SLR Consulting (Canada) Ltd.
300 Town Centre Boulevard, Suite 200, Markham, ON L3R 5Z6

May 23, 2023

Chris Lorenz, Resource Planner
Grand River Conservation Authority
400 Clyde Road, Box 729
Cambridge, ON N1R 5W6

Michael Oberle, Environmental Planning Coordinator
Saugeen Conservation
261123 Grey Road 28 RR1
Hanover, ON N4N 3B8

SLR Project No.: 209.30125.00003

## RE: Terms of Reference – Additional Studies: Scoped Environmental Impact Study Lots 223, 224, 225, and 226, Concessions 1 and 2 W, Dundalk, Ontario

SLR Consulting (Canada) Ltd. (SLR) is pleased to submit this Terms of Reference (ToR) in collaboration with Geomorphix on behalf of Flato Developments Inc. outlining the tasks required to complete additional studies required to support a Scoped Environmental Impact Study (EIS) and Tree Inventory and Preservation Plan (TIPP) for Lots 223, 224, 225, and 226, Concessions 1 and 2 W in Dundalk, Ontario (Site). The southeast half of the Site falls under the jurisdiction of the Grand River Conservation Authority (GRCA) and the northwest half of the Site is under the jurisdiction of Saugeen Conservation (SVCA). This ToR is considered a draft until approved by the applicable agencies.

### Project Understanding

It is understood that the Site is proposed for development into a residential subdivision and is subject to a Ministerial Zoning Order (MZO). Natural features on the site include:

- Three tributaries to the Grand River (headwater drainage features [HDF]) and their associated floodplains
- Three unevaluated wetlands on site (MAS2, SWM1-1 and SWD3-1/MAM2-2, Figure 1) and one immediately adjacent to the site (SWD, Figure 1)

Most of the Site is within GRCA or SVCA regulated lands. Features within the Site that are regulated by GRCA include unevaluated wetlands, a watercourse of unknown thermal regime, and an estimated associated floodplain. GRCA also identified the presence of two municipal drains (98- -L227C1W_A [tiled/closed] and 98- -L227C1W_B [open]). Permits under *Ontario Regulations (O. Reg.) 150/06 (GRCA) and 169/06 (SVCA): Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* are required for any development within regulated areas.

The GRCA (2015) *Policies for the Administration of O. Reg. 150/06* and SVCA (2017) *Environmental Planning and Regulations Policies Manual* state that any development within 30 m of unevaluated or locally significant wetlands (also known as the area of interference) requires permission from the appropriate conservation authority. Setback distances for development near regulated areas surrounding HDF typically require in-field

assessment to determine riverine flooding and erosion hazard allowances and valley slopes or meander belt allowance. Staking of the unevaluated wetlands is also typically required.

### Objectives for Additional Studies

The additional studies are proposed to further characterize the existing site conditions with respect to the subject wetlands and their hydrologic regimes.

### Terms of Reference

This ToR has been prepared to frame the study requirements for review by the Township of Southgate, Grey County, SVCA, and GRCA. The ToR was prepared in the context of the following:

- *Provincial Policy Statement, 2020*
- Federal *Fisheries Act, 2019*
- *Migratory Birds Convention Act, 1994*
- *Endangered Species Act, 2007*
- Federal *Species at Risk Act, 2002*
- *Greenbelt Plan, 2017*
- *O. Regs. 150/06 and 169/06*
- GRCA Planning and Permitting Policies, including GRCA (2015) *Policies for the Administration of O. Reg. 150/06*
- SVCA (2017) *Environmental Planning and Regulations Policies Manual*
- Township of Southgate and Grey County Official Plans
- GRCA (2005) *Environmental Impact Study Guidelines and Submission Standards for Wetlands*
- *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (Toronto and Region Conservation Authority and Credit Valley Conservation, 2014
- Preliminary site-wide water balance calculations completed by Crozier Consulting Engineers
- Comments on the first submission of the EIS (September 2022) received from the GRCA dated November 25, 2022 and from Triton Engineering dated December 13, 2022.

Specifically, the tasks to be included within the ToR are:

1. Characterize existing conditions
2. Description of the proposed development and potential changes to the hydrology and ecology of the subject wetlands that may result from the proposed development
3. Assess wetland sensitivity to potential changes
4. Alternatives assessment for proposed east-west arterial road alignment
5. Monitor the hydroperiod and hydrologic regime of the subject wetlands
6. Comparison of modeled post to pre hydrologic conditions based on site-wide water balance calculations
7. Provide input to aid in refinement of the site-wide water balance already prepared by Crozier to try and ensure that there is a site-wide balance for pre- to post conditions (a feature based water balance is not proposed)
8. Assessment of outlet options for stormwater facilities and suggest means of mitigating any anticipated impacts to the subject wetlands

## Closure

Please confirm that these Terms of Reference for a Scoped EIS meet the intent of the information and study requirements for the subject property as referenced above. If you have any further questions or comments, we look forward to discussing them with you at your earliest convenience.

Yours sincerely,

SLR Consulting (Canada) Ltd.

Matthew Ross, B.Sc.
Terrestrial Ecologist
226-203-7182
mross@slrconsulting.com

Kim Logan, B.Sc., P.Geo. (Limited), P.Biol.
Senior Ecologist
226-203-7214
klogan@slrconsulting.com


## LEGEND

- SITE BOUNDARY
- ECOLOGICAL LAND CLASSIFICATION (SLR CONSULTING, 2022)
- WATERBODIES
- PERMANENT WATERCOURSE
- RAILWAY

| ELC Code | ELC Description |
|---|---|
| Ag | Agriculture |
| CUM1-1 | Cultural Meadow |
| FOD5-2 | Dry-Fresh Sugar Maple-Beech Deciduous Forest |
| HR | Hedgerow |
| MAM2-2/SWT2- | Reed Canary Grass Mineral Meadow Marsh with Willow Thicket Swamp inclusion |
| MAS2 | Mineral Shallow Marsh Ecosite |
| MAS2/SWC1-1 | Mineral Shallow Marsh with White Cedar Coniferous Swamp inclusion |
| SWC1-1 | White Cedar Mineral Coniferous Swamp |
| SWD | Mineral Deciduous Swamp |
| SWD3-1/MAM2-2 | Red Maple Mineral Deciduous Swamp with Reed Canary Grass Mineral Meadow Marsh inclusion |
| SWM1-1 | White Cedar - Hardwood Mineral Mixed Swamp |
| SWT2-2 | Willow Mineral Thicket Swamp |

**NOTES:**
BASEDATA:
ONTARIO MINISTRY OF NATURAL RESOURCES, LAND INFORMATION ONTARIO (LIO)

0 25 50 100 150 m

SCALE 1:3,500
PAGE SIZE 11 x 17
NAD 1983 UTM Zone 17N

THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY AND SHOULD NOT BE USED FOR NAVIGATION

MHBC PLANNING, URBAN DESIGN & LANDSCAPE ARCHITECTURE
GLENELG PHASE 3
DUNDALK, ONTARIO, CANADA

ENVIRONMENTAL IMPACT STUDY

# ECOLOGICAL LAND CLASSIFICATION

SLR

FIGURE NO: 1

DATE: May 10, 2023

PROJECT NO: 209.V30125.00003


Legend

= SUBJECT LANDS

Project

TOWN OF DUNDALK

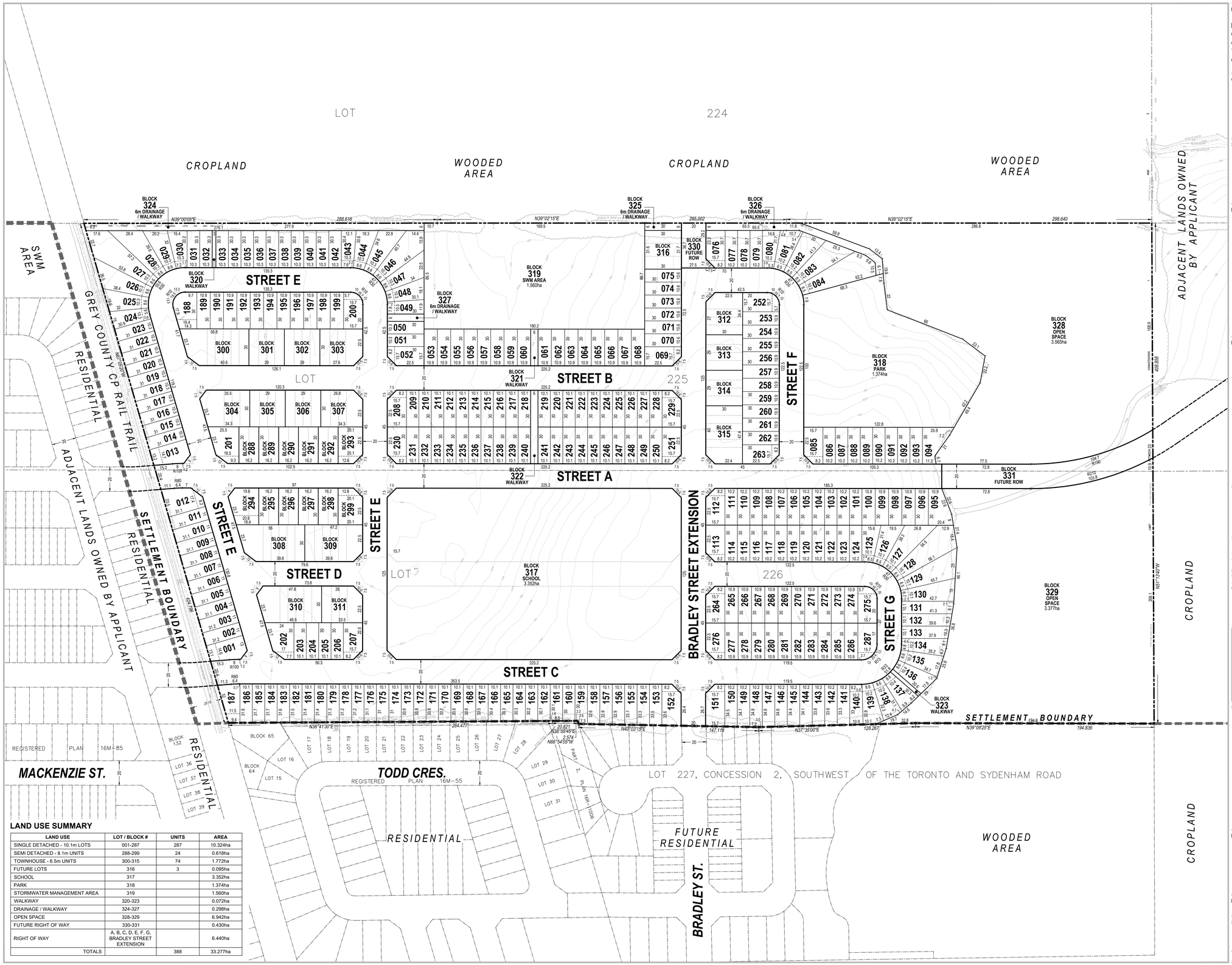
Drawing

GLENELG EXPANSION LANDS

CROZIER CONSULTING ENGINEERS
Admiral Building
1 First Street, Suite 200
Collingwood, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
www.cfcrozier.ca
info@cfcrozier.ca

| Drawn By | Design By | Project |
|---|---|---|
| D.K. | R.M. | 1060-6220 |

| Scale | Date | Check By | Drawing |
|---|---|---|---|
| N.T.S. | 05/26/2023 | R.M. | FIG. 1 |




## LAND USE SUMMARY

| LAND USE | LOT / BLOCK # | UNITS | AREA |
|---|---|---|---|
| SINGLE DETACHED - 10.1m LOTS | 001-287 | 287 | 10.324ha |
| SEMI DETACHED - 8.1m UNITS | 288-299 | 24 | 0.618ha |
| TOWNHOUSE - 6.5m UNITS | 300-315 | 74 | 1.772ha |
| FUTURE LOTS | 316 | 3 | 0.095ha |
| SCHOOL | 317 | | 3.352ha |
| PARK | 318 | | 1.374ha |
| STORMWATER MANAGEMENT AREA | 319 | | 1.560ha |
| WALKWAY | 320-323 | | 0.072ha |
| DRAINAGE / WALKWAY | 324-327 | | 0.298ha |
| OPEN SPACE | 328-329 | | 6.942ha |
| FUTURE RIGHT OF WAY | 330-331 | | 0.430ha |
| RIGHT OF WAY | A, B, C, D, E, F, G, BRADLEY STREET EXTENSION | | 6.440ha |
| TOTALS | | 388 | 33.277ha |

**LEGAL DESCRIPTION**

PART OF LOTS 225 AND 226
CONCESSION 2, SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD
GEOGRAPHIC TOWNSHIP OF PROTON
TOWNSHIP OF SOUTHGATE
COUNTY OF GREY

**OWNER'S CERTIFICATE**

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

DATE: _____

_____
SHAKIR REHMATULLAH - PRESIDENT
DUNDALK VILLAGE TWO INC.

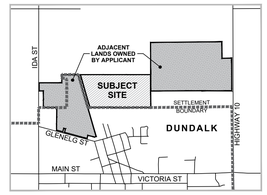
**SURVEYOR'S CERTIFICATE**

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____

_____
DAN DZALDOV - O.L.S.
SCHAEFFER DZALDOV BENNETT LTD.

**KEY PLAN**




**LEGEND**

- PROJECT BOUNDARY LINE
- RIGHT OF WAY LINE
- BLOCK LINE
- LOT LINE
- PARCEL FABRIC

| REVISION No. | DATE | ISSUED / REVISION | BY |
|---|---|---|---|
| 02 | MAY 18, 2023 | ADD SCHOOL, WALKWAYS, DRAINAGE BLOCKS; REMOVE STREET; CREATE CRESCENT STREET G; REVISE SWM AREA & LOT LAYOUTS | M.M. |
| 01 | AUG. 18, 2023 | 1st SUBMISSION | M.M. |

**ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990 C.P.13 AS AMENDED**

- **A.** AS SHOWN
- **B.** AS SHOWN
- **C.** AS SHOWN
- **D.** 290 SINGLES, 24 SEMIS, & 74 TOWNHOUSES
- **E.** AS SHOWN
- **F.** AS SHOWN
- **G.** AS SHOWN
- **H.** MUNICIPAL WATER SUPPLY
- **I.** LOAM/SILT LOAM
- **J.** AS SHOWN
- **K.** ALL SERVICES AS REQUIRED (WATER, SANITARY, STORMWATER, HYDRO)
- **L.** AS SHOWN


PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE
**MHBC PLANNING**
113 COLLIER STREET
BARRIE, ON, L4M 1H2
P: 705 728 0045 F: 705 728 2010
WWW.MHBCPLAN.COM


**STAMP**

| | |
|---|---|
| DATE | AUG. 18, 2022 |
| FILE No. | 15184AT |
| SCALE | 1:1,400 (ARCH D) |
| DRAWN BY | M.M. |
| CHECKED BY | K.C. |
| OTHER | |

**PROJECT**

## GLENELG PHASE 3

DUNDALK VILLAGE TWO INC.
3621 HIGHWAY 7 EAST, SUITE 503
MARKHAM, ON L3R 0G6
P:(905) 479-9292 F:(905) 429-9165
WWW.FLATOGROUP.COM

NORTH

**FILE NAME**
**DRAFT PLAN OF SUBDIVISION**

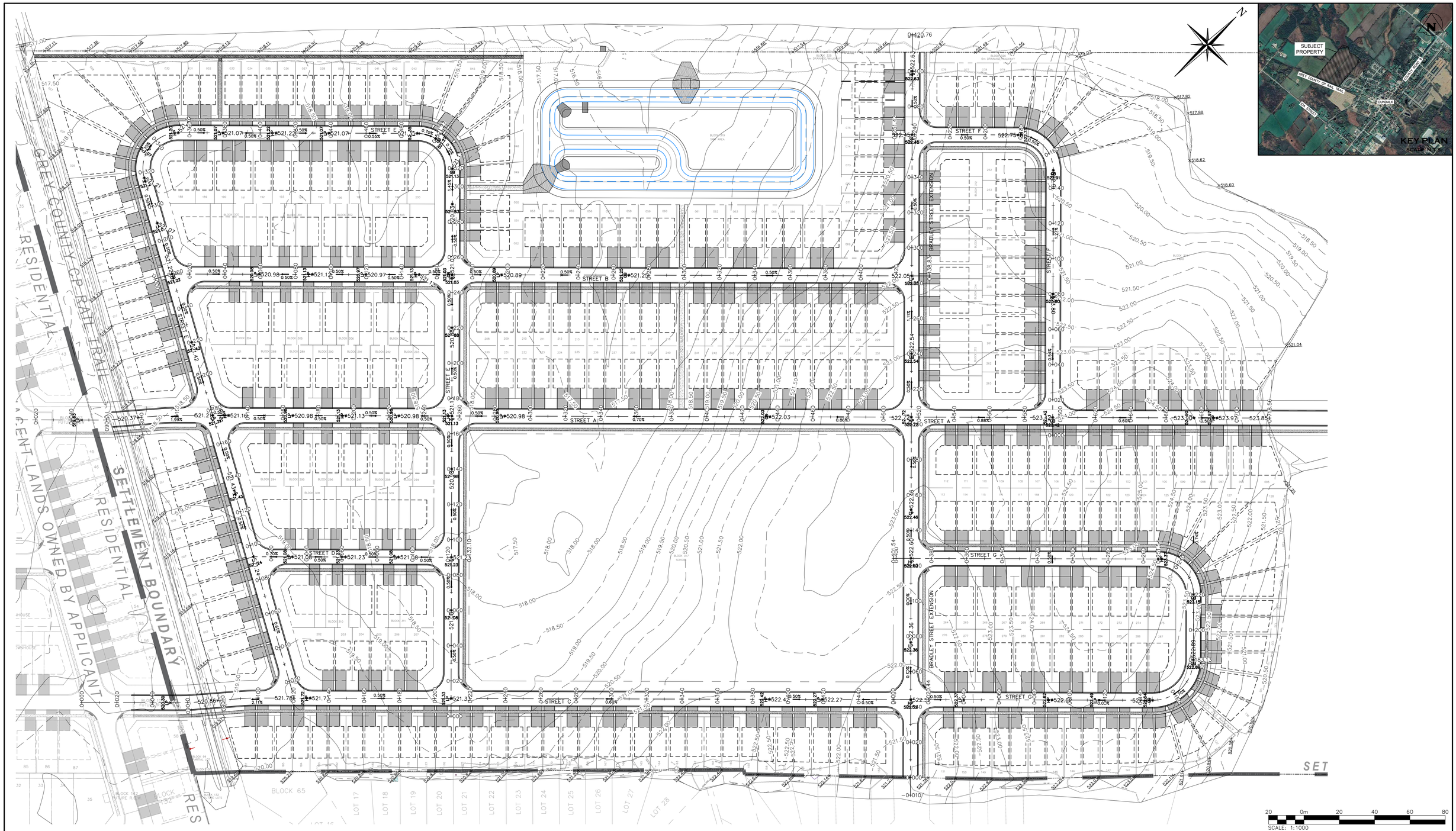
**DWG No.** 1 of 1

**SCALE BAR**

0 7 14 21 28 35 52.5 70 105 140m

MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

N:\Southgate\15184AT\Drawings\Draft Plan\CAD\

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3. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
4. DO NOT SCALE THE DRAWINGS.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

LEGEND

| | |
|---|---|
| XXX.X | EX. CONTOUR |
| +XXX.XX | PR. ELEVATION |
| +XXX.XX | PR. ELEVATION (MATCH EX. ELEVATION) |
| | PROPERTY LINE |

Town

| No. | ISSUE | DATE: MMM/DD/YYYY |
|---|---|---|
| 1 | ISSUED FOR 1st SUBMISSION | AUG/26/2022 |
| 2 | ISSUED FOR 2nd SUBMISSION | MAY/26/2023 |

Engineer

Engineer

Project

GLENELG EXPANSION LANDS
TOWNSHIP OF SOUTHGATE

Drawing

PRELIMINARY GRADING PLAN

CROZIER
CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

| Drawn By | Design By | Project |
|---|---|---|
| V.P. | V.P./K.S. | 1060–6220 |
| Check By | Check By | Scale / Drawing |
| N.C.O./K.S. | N.C.O./K.S. | 1:1000 / FIG3 |


DRAINAGE TO NORTH TILE DRAIN

DRAINAGE TO EAST TILE DRAIN

DRAINAGE TO GREY COUNTY CP TRAIL

CONNECT TO SANITARY AND WATER SERVICING ALONG CORBETT STREET

CONNECTION TO FUTURE WHITE ROSE DEVELOPMENT PHASE 3

DRAINAGE TO SOUTHEAST TILE DRAIN

GREY COUNTY CP RAIL TRAIL

SETTLEMENT BOUNDARY

RESIDENTIAL

CORBETT STREET

BRADLEY STREET EXTENSION

STREET A

STREET B

STREET C

STREET D

STREET E

STREET F

STREET G

BLOCK 319 SWM AREA

BLOCK 317 SCHOOL

BLOCK 318 PARK

BLOCK 65

SCALE: 1:1000

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LEGEND

- APPROXIMATE SANITARY SEWER AND MANHOLE LAYOUT
- APPROXIMATE STORM SEWER AND MANHOLE LAYOUT
- APPROXIMATE RLCB LOCATION
- APPROXIMATE WATERMAIN LAYOUT
- PROPERTY LINE
- SANITARY DRAINAGE AREA TO WHITE ROSE DEVELOPMENT
- SANITARY DRAINAGE AREA TO SAN MH11 GLENELG PHASE 2
- SANITARY DRAINAGE AREA TO SAN MH9 GLENELG PHASE 2

Town

| No. | ISSUE | DATE: MMM/DD/YYYY |
|---|---|---|
| 1 | ISSUED FOR 1st SUBMISSION | AUG/26/2022 |
| 2 | ISSUED FOR 2nd SUBMISSION | MAY/26/2023 |

Engineer

Engineer

Project: GLENELG EXPANSION LANDS
TOWNSHIP OF SOUTHGATE

Drawing: GENERAL SITE SERVICING PLAN

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

| Drawn By | Design By | Project |
|---|---|---|
| V.P. | V.P./K.S. | 1060-6220 |
| Check By | Check By | Scale / Drawing |
| N.C.O./K.S. | N.C.O./K.S. | 1:1000 / FIG4 |


DRAINAGE TO GREY COUNTY CP TRAIL (OUTLET #1) 4.32 ha.

DRAINAGE TO NORTH TILE DRAIN (OUTLET #2) 13.33 ha.

PROPERTY LINE

DRAINAGE TO EAST TILE DRAIN (OUTLET #3) 3.05 ha.

ENVIRONMENTAL PROTECTION AREA

DRAINAGE TO SOUTHEAST TILE DRAIN (OUTLET #4) 2.29 ha.

DRAINAGE TO SOUTH RESIDENTIAL (OUTLET #5) 3.00 ha.

PRE-1 | 4.32 | 74

PRE-2 | 13.33 | 74

PRE-3 | 3.05 | 74

PRE-4 | 2.29 | 74

PRE-5 | 3.00 | 74

50 0m 50 100

SCALE: 1:1500

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4. DO NOT SCALE THE DRAWINGS.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

LEGEND

- OVERLAND FLOW DIRECTION
- CATCHMENT AREAS
- PROPERTY LINE
- PRE-X | XX.XX | XX — DRAINAGE ID / AREA (ha.) | CN COEFFICIENT
- APPROXIMATE TILE DRAIN LOCATION

Town

| No. | ISSUE | DATE: MMM/DD/YYYY |
|---|---|---|
| 1 | ISSUED FOR 1st SUBMISSION | AUG/26/2022 |
| 2 | ISSUED FOR 2nd SUBMISSION | MAY/26/2023 |

Engineer

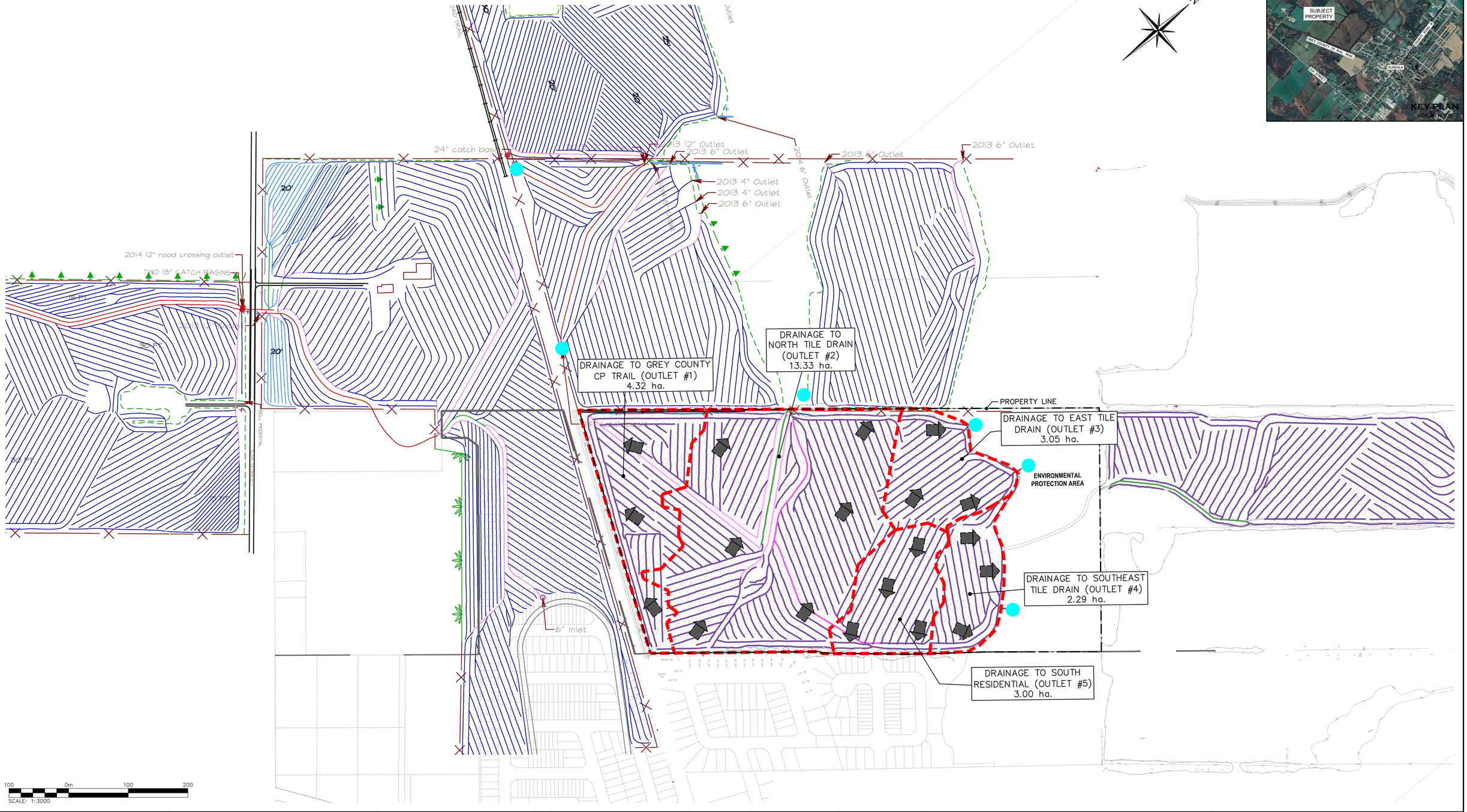
Engineer

Project: GLENELG EXPANSION LANDS
TOWNSHIP OF SOUTHGATE

Drawing: PRE-DEVELOPMENT DRAINAGE PLAN

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

| Drawn By | Design By | Project | |
|---|---|---|---|
| V.P. | V.P./K.S. | 1060-6220 | |
| Check By | Check By | Scale | Drawing |
| N.C.O./K.S. | N.C.O./K.S. | 1:1500 | FIG 5 |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4. DO NOT SCALE THE DRAWINGS.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

LEGEND
- OVERLAND FLOW DIRECTION
- CATCHMENT AREAS
- PROPERTY LINE
- APPROXIMATE TILE DRAIN LOCATION

Town

| No. | ISSUE | DATE: MM/DD/YYYY |
|---|---|---|
| 1 | ISSUED FOR 1st SUBMISSION | AUG/26/2022 |
| 2 | ISSUED FOR 2nd SUBMISSION | MAY/26/2023 |

Engineer

Engineer

Project
GLENELG EXPANSION LANDS
TOWNSHIP OF SOUTHGATE

Drawing
EXISTING TILE DRAINS AND
PRE-DEVELOPMENT DRAINAGE

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

| Drawn By | Design By | Project |
|---|---|---|
| V.P. | V.P./K.S. | 1060-6220 |
| Check By | Check By | Scale / Drawing |
| N.C.O./K.S. | N.C.O./K.S. | 1:3000 / FIG 6 |


DRAINAGE TO GREY COUNTY CP TRAIL (OUTLET #1) 4.32 ha.

DRAINAGE TO NORTH TILE DRAIN (OUTLET #2) 13.33 ha.

PROPERTY LINE

DRAINAGE TO EAST TILE DRAIN (OUTLET #3) 3.05 ha.

ENVIRONMENTAL PROTECTION AREA

DRAINAGE TO SOUTHEAST TILE DRAIN (OUTLET #4) 2.29 ha.

DRAINAGE TO SOUTH RESIDENTIAL (OUTLET #5) 3.00 ha.

PRE-1 | 4.32 | 74

PRE-2 | 13.33 | 74

PRE-3 | 3.05 | 74

PRE-4 | 2.29 | 74

PRE-5 | 3.00 | 74

BLOCK 132, BLOCK 65, BLOCK 64, LOT 15, LOT 16, LOT 17, LOT 18, LOT 19, LOT 20, LOT 21, LOT 22, LOT 23, LOT 24, LOT 25, LOT 26, LOT 27, LOT 28, LOT 29, LOT 30, LOT 31, LOT 36, LOT 37, LOT 38, LOT 39

50 0m 50 100
SCALE: 1:1500

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5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

LEGEND

- OVERLAND FLOW DIRECTION
- CATCHMENT AREAS
- PROPERTY LINE
- PRE-X | XX.XX | XX — DRAINAGE ID / AREA (ha.) | CN COEFFICIENT
- APPROXIMATE TILE DRAIN LOCATION
- GRCA REGULATION LIMIT
- SVCA SCREENING AREA (2021)

Town

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| 2 | ISSUED FOR 2nd SUBMISSION | MAY/26/2023 |

Engineer

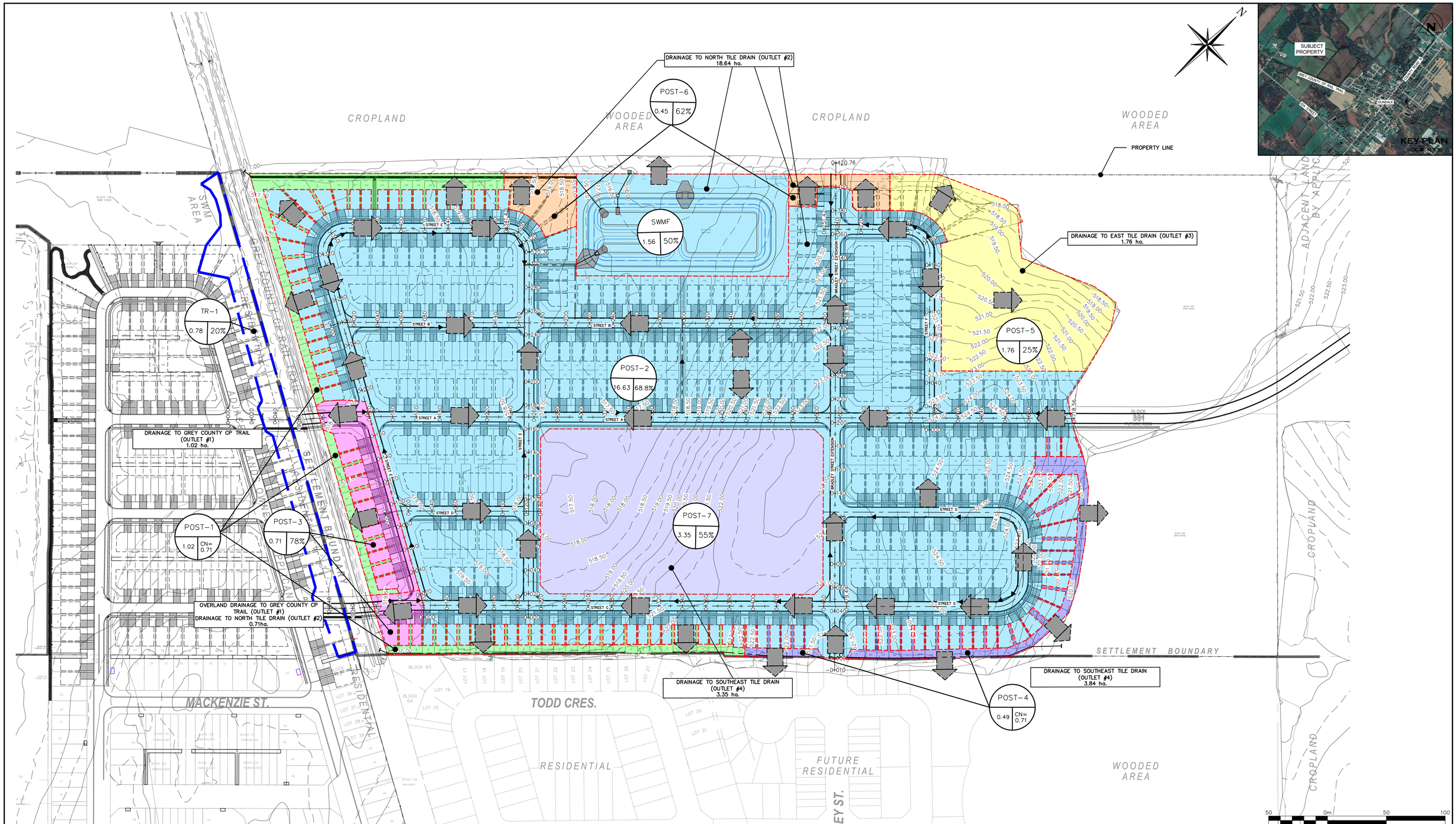
Engineer

Project: GLENELG EXPANSION LANDS
TOWNSHIP OF SOUTHGATE

Drawing: CONSERVATION AREAS & PREDEVELOPMENT DRAINAGE PLAN

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

| Drawn By | Design By | Project | |
|---|---|---|---|
| V.P. | V.P./K.S. | 1060-6220 | |
| Check By | Check By | Scale | Drawing |
| N.C.O./K.S. | N.C.O./K.S. | 1:1500 | FIG 7 |

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LEGEND

- OVERLAND FLOW DIRECTION
- CATCHMENT AREAS
- PROPERTY LINE
- POST-x DRAINAGE ID
- xx.xx | xx AREA (ha.) | % IMPERVIOUS OR CN COEFFICIENT
- OVERLAND DRAINAGE AREA TO OUTLET #1
- DRAINAGE AREA TO OUTLET #2
- DRAINAGE AREA TO OUTLET #1
- DRAINAGE AREA TO OUTLET #2
- DRAINAGE AREA TO OUTLET #2
- DRAINAGE AREA TO OUTLET #3
- DRAINAGE AREA TO OUTLET #4
- OVERLAND DRAINAGE AREA TO OUTLET #4
- OVERLAND DRAINAGE AREA TO OUTLET #2

Town

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Engineer

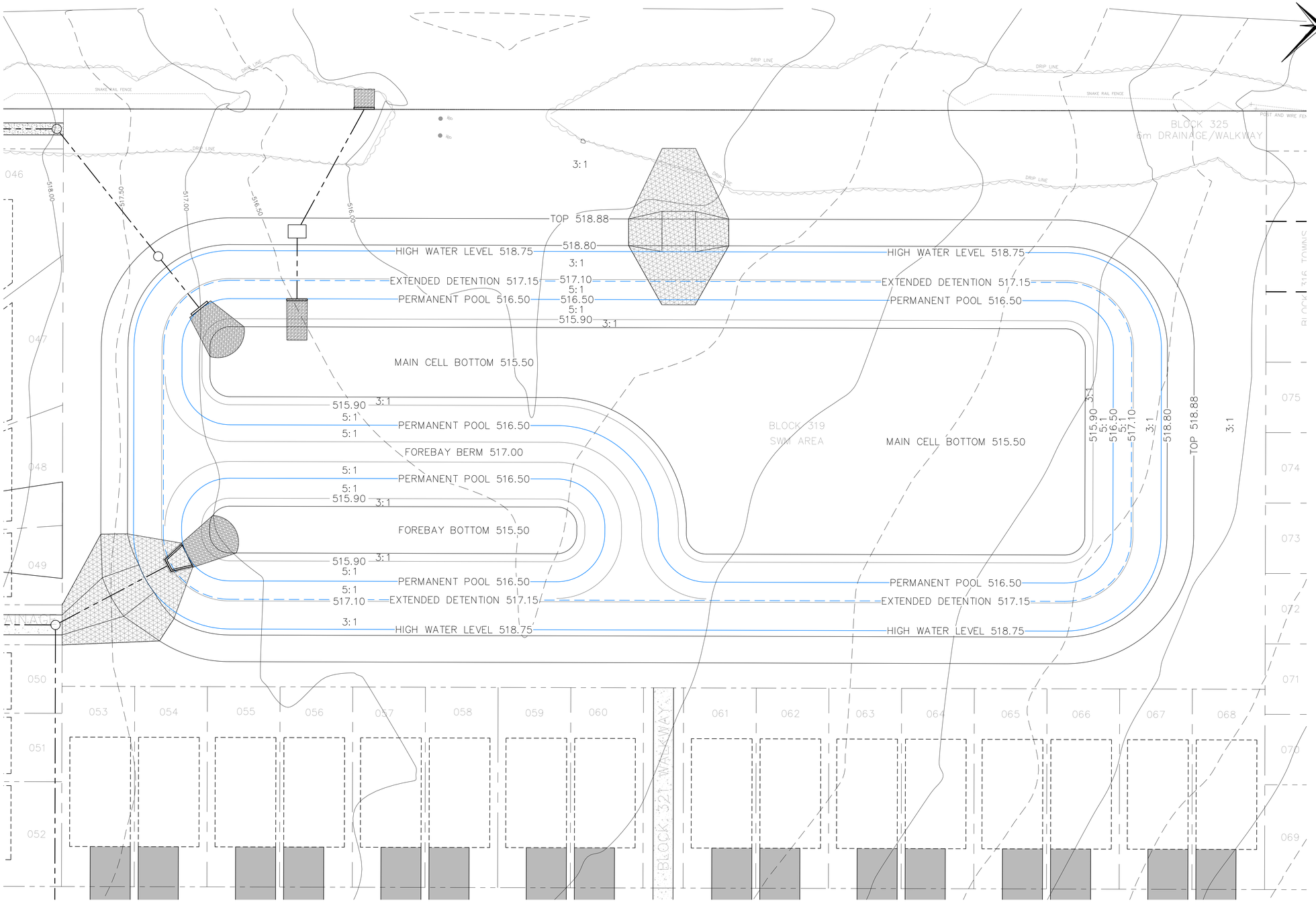
Engineer

Project: GLENELG EXPANSION LANDS
TOWNSHIP OF SOUTHGATE

Drawing: POST DEVELOPMENT DRAINAGE PLAN

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

| Drawn By | Design By | Project |
|---|---|---|
| V.P. | V.P./K.S. | 1060-6220 |
| Check By | Check By | Scale / Drawing |
| N.C.O./K.S. | N.C.O./K.S. | 1:1500 / FIG8 |


10 0m 10 20
SCALE: 1:300

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Engineer

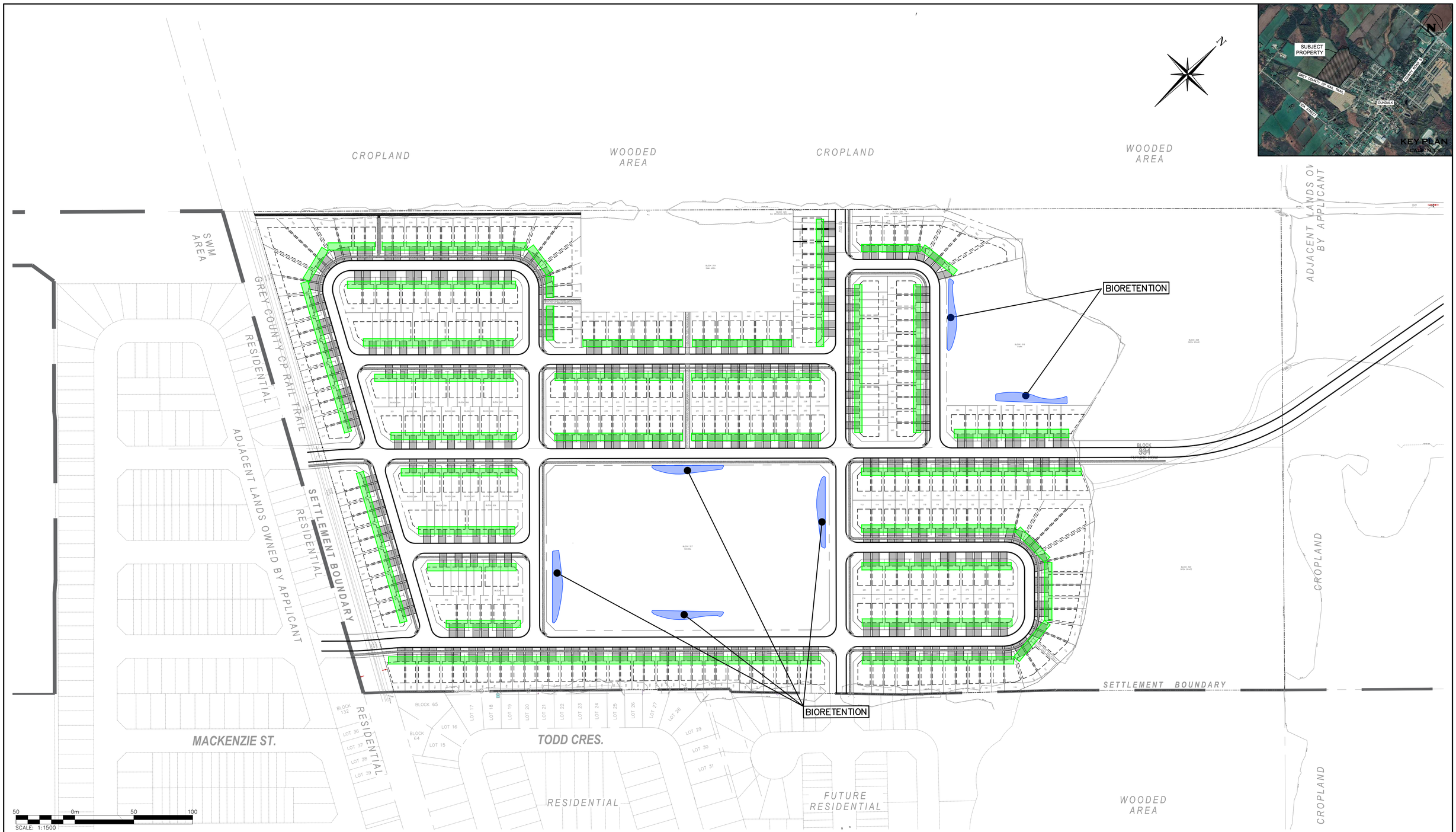
Engineer

Project
GLENELG EXPANSION LANDS
TOWNSHIP OF SOUTHGATE

Drawing
PRELIMINARY SWMF

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705 446 3510 T
705 446 3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

| Drawn By | Design By | Project |
|---|---|---|
| V.P. | V.P./K.S. | 1060-6220 |
| Check By | Check By | Scale / Drawing |
| N.C.O./K.S. | N.C.O./K.S. | 1:300 / FIG9 |

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LEGEND

PROPERTY LINE

APPROXIMATE LOCATION OF TREE PITS

APPROXIMATE LOCATION OF BIORETENTION

Town

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Engineer

Engineer

Project

GLENELG EXPANSION LANDS
TOWNSHIP OF SOUTHGATE

Drawing

PROPOSED LID PLAN


CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705 446-3510 T
705 446-3520 F
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INFO@CFCROZIER.CA


| Drawn By | Design By | Project | |
|---|---|---|---|
| V.P. | V.P./K.S. | | 1060-6220 |
| Check By | Check By | Scale | Drawing |
| N.C.O./K.S. | N.C.O./K.S. | 1:1500 | FIG 10 |