ENVIRONMENTAL AND ENGINEERING SUMMARY REPORT

for

LAURELPARK SUBDIVISION

Final Report Prepared for:

Laurelpark Inc.
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Prepared by:

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Reference: 16-168

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1.0 INTRODUCTION

Calder Engineering Ltd. has been retained by Laurelpark Inc. to prepare an Environmental and Engineering Summary Report for the proposed Laurelpark Subdivision in the Palgrave Estate Residential Community of the Town of Caledon. The report is supporting documentation for the respective subdivision Draft Plan application and has been prepared to meet requirements of Section 7.1.18.11 of the Town of Caledon Official Plan.

The site location is shown in Figure 1.1. The site is bounded by Mount Pleasant Road and estate residential development to the east, estate and rural residential development to the north, agricultural land to the west, and rural residential land to the south. The legal description of the property is Part of the East Half of Lot 19, Concession 8, former Township of Albion, Town of Caledon, Regional Municipality of Peel.

The overall site comprises approximately 10.38 hectares or 25.64 acres. It is proposed to develop the site with 8 estate residential lots using a combined rural and urban road cross-section, individual private septic systems for sewage disposal, and municipal water. Drainage and storm water would be managed using an adaptive stormwater management approach and application of Low Impact Development (LID) practices. The objective of the adaptive stormwater management approach is to provide the framework and process for meeting Town of Caledon and Conservation Authority stormwater management criteria, and protection of site environmental features.

The objective of this report is to integrate and summarize the environmental site investigations, mapping and analysis, with the findings of the Preliminary Engineering and Stormwater Management Report and other supporting technical studies.

FIGURE 1.1
STUDY AREA LOCATION

Reference: Aerial Image from Google Earth (2016)

Calder Engineering Ltd.

2.0 STUDY AREA

2.1 General

The site is located in the Palgrave Estate Residential Community area of the Town of Caledon and is bounded by Mount Pleasant Road and estate residential development to the east, estate and rural residential development to the north, agricultural land to the west, and rural residential land to the south. The legal description of the property is Part of the East Half of Lot 19, Concession 8, former Township of Albion, Town of Caledon, Regional Municipality of Peel.

The overall site comprises approximately 10.38 hectares (ha). It is proposed to develop the site with 8 estate residential lots using a combined rural and urban road cross-section, individual private septic systems for sewage disposal, and municipal water. Drainage and storm water would be managed using an adaptive stormwater management approach and application of Low Impact Development (LID) practices. The objective of the adaptive stormwater management approach is to provide the framework and process for meeting Town of Caledon and Conservation Authority stormwater management criteria, and protection of site environmental features.

Illustrated on Figure 2.1 is the proposed lot pattern and road alignment. Access to the subdivision would be from Mount Pleasant Road for lots in the eastern part of the site and from Diamondwood Drive for lots in the western part of the site. The proposed Draft Plan is provided in Appendix A.

2.2 Physiography and Landform

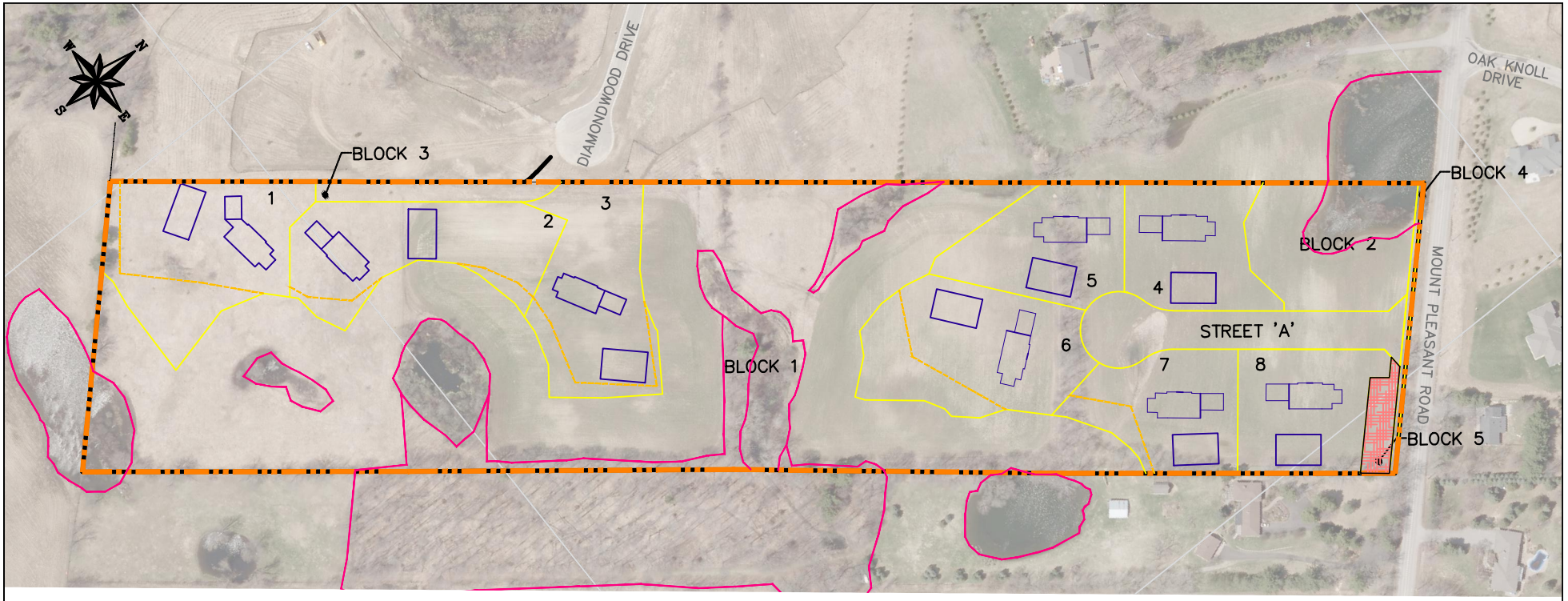
The property is located within the physiographic region referred to as the Oak Ridges Moraine (Chapman and Putnam, 1984). The Oak Ridges Moraine is a prominent physiographic feature in south-central Ontario forming a west to east trending ridge that is approximately 160 kilometres (km) long and 2 to 11 km wide. Extending from the Niagara Escarpment to the Trent Talbot River, the Oak Ridges Moraine consists of several distinct sections. The subject property is located within the Albion Hills area of the Town of Caledon. The Albion Hills typically consist of deep beds of evenly graded fine sand, however, in the vicinity of the property, the physiographic setting consists of a Till Moraine.

The key geological units found within the property are the Thorncliffe Formation, the Northern Till, the Oak Ridges Moraine sediments, and the Halton Till. The property is located on the southern flanks of Mount Wolfe, which is an inlier of the Northern Till, which extends up through the younger deposits of the Oak Ridges Moraine.

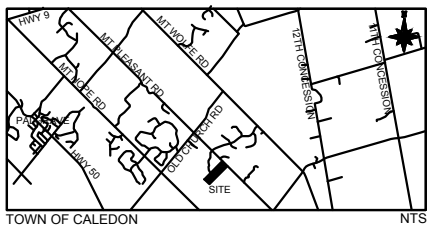
Additional information on local geology, landform, hydrology, and hydrogeology has been provided by Azimuth Environmental Consulting Inc. (2017a).

2.3 Topography

The site topography is undulating and hummocky with moderate to steep slopes. Areas with identified seasonal groundwater levels within a metre of the ground surface (i.e., designated as Environmental Zone 2 areas per the Town of Caledon Official Plan) and wetland features are typically located in the topographic lows.



KEY PLAN



TOWN OF CALEDON NTS

LEGEND

- PROPERTY LINE
- PROPOSED LOT/BLOCK LINE
- PROPOSED STRUCTURE ENVELOPE
- ORMCP KEY NATURAL HERITAGE FEATURE
- CONCEPTUAL HOUSE LOCATION
- CONCEPTUAL SEPTIC LOCATION
- PROPOSED SWM BLOCK
- 2 PROPOSED LOT/BLOCK NUMBER

NOTES

1. IMAGE SOURCE: FIRST BASE SOLUTIONS, 2002. IMAGE PLACEMENT IS APPROXIMATE AND NOT ORTHORECTIFIED

50m 0 50m 100m

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TOWN OF CALEDON

LAURELPARK INC.

LAURELPARK SUBDIVISION
PART OF EAST HALF OF LOT 19, CONCESSION 8
TOWN OF CALEDON, REGION OF PEEL

FIGURE 2.1
PROPOSED LOT PATTERN AND ROAD ALIGNMENT

The highest elevation on the site occurs on two small hills within the property (each at approximate elevation 285.5 metres) and the lowest elevation occurs in the southwest corner of the property (approximate elevation 269.5 metres).

The Palgrave Estates Residential Community Secondary Plan (PERCSP) contains policies for development within the Palgrave Estates area which apply to this proposed subdivision. Specific references to topography and slopes within the secondary plan are discussed below.

Section 7.1.9.11 of the PERSCP specifies that structure envelopes will generally be restricted to areas with slopes of 10 per cent or less and may include areas with 11 to 15 per cent slope and occasionally greater than a 15 percent slope in order to permit the advantageous siting of a house designed for steep slopes. Additionally, all structure envelopes must include a well-drained area with slopes of 10 percent or less for a sewage disposal system. Consistent with this policy, all proposed lots have an appropriate area for sewage disposal system and generally include gentler slopes within the structure envelope.

Section 7.1.9.23 of the PERSCP specifies that the continuity and integrity of the lowland open space system must be maintained in estate residential plans of subdivision. The proposed subdivision is in general conformance with this policy based the siting of lots away from the lowland areas and out of the Key Natural Heritage Features and associated minimum vegetation protection zones.

Section 7.1.9.40 of the PERSCP specifies that roads in estate residential developments should follow the topography of the site and Section 7.1.9.41 specifies that the depth of cut for local streets and structure envelopes in future estate residential plans of subdivision will normally be restricted to 1 to 2 metres. The Street A alignment and lot grading for lots 4 through 8 does not result in a depth of cut greater than 2 metres from the existing ground surface. With exception of a very small area associated the driveway access to lots 2 and 3 where the cut is approximately 2.5 metres, the lot grading for lots 1 through 3 does not result in a depth of cut greater than 2 metres from the existing ground surface.

2.4 Pre-Development Drainage Patterns and Land Uses

The land was historically cleared and farmed. Currently, portions of the lands are planted with agricultural crops. The remaining areas are either cultural meadows or wetland and hedgerow features. There are no buildings or structures on the property.

The site is part of the Humber River Watershed. Surface flow on the site is typically via sheet flow to the topographic lows and then off-site via either intermittent or ephemeral drainage features. A portion of the site drains northward and a portion drains southward: both to tributaries of Cold Creek which is part of the Humber River Watershed. Cold Creek is a tributary of the main branch of the Humber River. The site falls within the jurisdiction of the Toronto Region Conservation Authority.

The pre-development drainage patterns have been broken down into the 9 sub-basins shown on the Surface Hydrology Map (Map 5) provided in Appendix A. Sub-basins 3, 7 and 9 drain to the north, and sub-basins 1, 2, 4, 5, 6, and 8 drain to the south. There are no external drainage areas conveying flow to the site. Summarized in Table 2.1 are pre-development sub-basin characteristics.

TABLE 2.1
SUMMARY OF PRE-DEVELOPMENT SUB-BASIN CHARACTERISTICS

Sub-basin	Drainage Area (ha)	Outlet	Receiver
1	1.92	site wetland feature	Cold Creek Tributary, Humber River Watershed
2	1.60	dry swale in Sub-basin A2	Cold Creek Tributary, Humber River Watershed
3	0.18	Diamondwood Drive	Cold Creek Tributary, Humber River Watershed
4	2.60	dry swale on property to the south	Cold Creek Tributary, Humber River Watershed
5	1.79	dry swale on property to the south	Cold Creek Tributary, Humber River Watershed
6	2.58	pond feature on property to the south	Cold Creek Tributary, Humber River Watershed
7	1.46	Existing Pond and Mount Pleasant Road Ditch (draining north)	Cold Creek Tributary, Humber River Watershed
8	0.38	Mount Pleasant Road Ditch (draining south)	Cold Creek Tributary, Humber River Watershed
9	0.05	Diamondwood Drive	Cold Creek Tributary, Humber River Watershed
Total:	12.56		

Note:
1. Units: ha – hectares.
2. Refer to the Surface Hydrology Map (Map 5) in Appendix A for sub-basin delineation.

3.0 DRAFT PLAN AND ENVIRONMENTAL MAPPING

A Draft Plan and environmental mapping have been prepared for the project and should be read in conjunction with this report. The environmental mapping is supporting documentation for the respective subdivision Draft Plan application and has been prepared to meet requirements of Section 7.1.18.2 of the Town of Caledon Official Plan. The Draft Plan and environmental mapping have been provided in a separate stand-alone document entitled “Draft Plan and Technical Supporting Maps” which includes the following:

- Draft Plan of Subdivision
- Air Photo and Street Concept
- Topographic Map
- Slope Map
- Slope Map with Proposed Contours
- Soil and Soil Classification Map
- Surface Hydrology Map
- Proposed Drainage Boundaries Map
- Vegetation and Wildlife Ecology Map
- Rare Flora Species Map
- Environmental Summary Map

4.0 SOIL INVESTIGATION

A geotechnical investigation was performed by Terraprobe Inc. (2017) comprising 12 boreholes extending to a depth of approximately 6.5 metres. In addition, 12 test pits were excavated across the site. It is reported that the site consists of an approximately 250 to 400 millimetre layer of topsoil which overlays typically a native clayey silt/silt soil. In vicinity of two boreholes, a native sandy silt was encountered.

It is indicated in the geotechnical investigation that the native clayey-silt/silt is practically impervious with an estimated coefficient of permeability of 10^{-6} centimetres per second (cm/s) and the native sandy silt has a moderate to relatively low permeability with an estimated coefficient of permeability in the range of 10^{-4} to 10^{-5} cm/s. The sandy silt soil was encountered at boreholes 5 and 12 which are located in vicinity of the two high points on the site.

5.0 PRELIMINARY ENGINEERING AND STORMWATER MANAGEMENT REPORT

A Preliminary Engineering and Stormwater Management Report was prepared by Calder Engineering Ltd. (2017). The report is supporting documentation for the respective subdivision Draft Plan application and was prepared to meet requirements of sections 7.1.18.7 and 7.1.18.8 of the Town of Caledon Official Plan. Identified in the report were preliminary road grades, proposed methods for site sanitary and water servicing, and plan for drainage and stormwater management. The information was noted as preliminary and subject to detailed design. Detailed design of the road system, site sanitary and water services, and drainage and stormwater management infrastructure would be undertaken following Draft Plan Approval.

Summarized below are the main conclusions from the report.

1. The overall site comprises approximately 10.38 hectares or 25.64 acres. It is proposed to develop the site with 8 estate residential lots using a combined rural and urban road cross-section, individual private septic systems for sewage disposal, and municipal water. Drainage and storm water would be managed using an adaptive stormwater management approach and application of Low Impact Development (LID) practices. The objective of the adaptive stormwater management approach is to provide the framework and process for meeting Town of Caledon and Conservation Authority stormwater management criteria, and protection of site environmental features.

2. The site is part of the Humber River Watershed. Surface flow on the site is typically via sheet flow to the topographic lows and then off-site via either intermittent or ephemeral drainage features. A portion of the site drains northward and a portion drains southward: both to tributaries of Cold Creek which is part of the Humber River Watershed. Cold Creek is a tributary of the main branch of the Humber River. The site falls within the jurisdiction of the Toronto Region Conservation Authority.

3. Drainage and storm water would be managed using an adaptive stormwater management approach and application of Low Impact Development (LID) practices. The objective of the adaptive stormwater management approach is to provide the framework and process for meeting Town of Caledon and Conservation Authority stormwater management criteria and protection of site environmental features. The approach includes:

    - establishment of stormwater management criteria
    - establishment of performance objectives
    - outline of a stormwater management strategy
    - monitoring to gain additional information on site natural features and groundwater conditions
    - identification of indicators to assess effectiveness of the stormwater management strategy
    - identification of triggers to initiate review of the stormwater management strategy
    - development of contingency plans and adaptive management measures to offset any identified impacts

4. The proposed stormwater management strategy comprises a “treatment train” approach utilizing a combination of lot level controls and Low Impact Development (LID) measures

to minimize potential increases in volume of runoff and provide, as far as practical, a natural hydrologic response. Measures are proposed to be undertaken at the source, and conveyance and end of pipe locations, and are as follows:

- recharge of residential roof and driveway storm water by direction to grassed and naturalized areas to promote filtering and natural infiltration;
- discharge of foundation drain water to rear and side lot areas;
- by lot grading, direction of structure envelope drainage, via sheet flow, towards grassed and naturalized areas versus the road right of way;
- as far as practical, application of grassed swales for road drainage versus a piped storm sewer system;
- minimization of road drainage to the wetland features;
- use of a bioretention area to temporarily detain and slowly release storm water to meet applicable stormwater management criteria; and
- use of filter strips and level spreaders to diffusely discharge storm water.

The use of grassed swales versus a piped storm sewer system is proposed to encourage passive infiltration of storm water, provide linear storage in the conveyance system to dampen hydrologic response, and provide pre-treatment of storm water prior to discharge to the proposed bioretention area.

5. Hydrologic modelling and "desk-top" assessments were performed to develop and evaluate the proposed Stormwater Management Plan. Based on the respective technical analyses, proposed stormwater management criteria for quantity control, quality control, erosion control, and water balance can be achieved.

6. The minor and major drainage system will consist of both the proposed road system, grassed swales, and storm sewers. As much as practical, the existing natural drainage patterns will be maintained. The drainage system will be designed to manage storm water for up to the 100-year design storm consistent with Town of Caledon Development Standards, Policies, and Guidelines (2009) and Toronto and Region Conservation stormwater management criteria. Peak flows up to the 100-year design level would be contained within the municipal road right-of-way, and a bioretention area prior to release to the environment.

7. Sanitary servicing for the proposed subdivision will be by individual on-site sewage disposal systems (e.g., septic systems). Subject to detailed design at the Building Permit application stage, it is anticipated that the on-site sewage disposal systems would comprise a septic tank(s) sized at twice the daily design flow, effluent filter, tertiary treatment unit, dispersal bed, and ancillary piping, pumping system(s), and controls. A tertiary treatment unit is anticipated required to fit the respective dispersal bed within the lot structure envelope in conjunction with the dwelling and driveway features.

8. The Laurelpark Subdivision will be serviced by municipal water. There is an existing 300 millimetre diameter watermain located on the west side of Mount Pleasant Road and a 50 millimetre watermain on the Diamondwood Drive cul-de-sac. It is proposed that lots 4 through 8 on Street 'A' of the Laurelpark Subdivision will be serviced by a 150 millimetre diameter watermain that would be connected to the 300 millimetre watermain on Mount Pleasant Road. The Street 'A' watermain would be complete with required appurtenances such as valving and hydrants. The water services for lots 1, 2, and 3 would be connected to the existing 50 millimetre diameter watermain on Diamondwood Drive. The water distribution system would be designed, supplied, and installed in general conformance with the Region of Peel Public Works Design, Specifications and Procedures Manual, Linear Infrastructure, Watermain Design Criteria (2010).

9. Considerations are provided for erosion and sediment control planning. Erosion and Sediment Control Plans have been prepared consistent with the Town of Caledon Development Standards, Policies & Guidelines (2009) and the Erosion & Sediment Control Guideline for Urban Construction prepared by the Greater Golden Horseshoe Area Conservation Authorities (2006).

6.0 HYDROGEOLOGY AND GROUNDWATER

To comply with requirements of the Oak Ridges Moraine Conservation Plan (Ontario Regulation 140/02) and the Town of Caledon Palgrave Estates Residential Community Secondary Plan, a hydrogeologic assessment has been prepared by Azimuth Environmental Consulting Inc. (2017a) to determine and describe the hydrogeologic and hydrologic functions of sensitive features. The evaluation focused on the nature of the interaction between the ground water system and the surface water system. The evaluation examined the effect of the proposed development and site alteration on the ground and surface water regimes through the completion of pre and post water balance assessments and Reasonable Use Policy (RUP) evaluation.

It is reported by Azimuth Environmental Consulting Inc. in the hydrogeologic assessment that data compiled during the long-term monitoring program implemented for the project provides sufficient evidence that impacts to surface/ground water quality and quantity will be minimal following construction of the proposed estate residential subdivision. Therefore, it is recommended by Azimuth Environmental Consulting Inc. that no changes to the proposed Draft Plan are recommended (i.e., lot density).

It is concluded by Azimuth Environmental Consulting Inc. in the hydrogeologic assessment that the present hydrologic and hydrogeologic conditions upon the subject property will not experience a significant change due to do the proposed development. By incorporating the criteria as described by Azimuth Environmental Consulting Inc. in the hydrogeologic assessment, pre-development infiltration will experience an approximate gain of 11%. This gain in infiltration will have no negative impact on the local ground water regime and associated natural features.

In addition, it is stated that the proposed development adheres to the requirements of the Oak Ridges Moraine Conservation Plan, and that no negative post-construction impacts are predicted to occur to the quality/quantity of surface and ground water, ground water recharge, or natural sensitive features.

7.0 ENVIRONMENTAL IMPACT STUDY AND MANAGEMENT PLAN

Azimuth Environmental Consulting, Inc. (Azimuth) was retained by Laurelpark Inc. to complete an Environmental Impact Study and Management Plan (EIS & MP) for the proposed Laurelpark Subdivision. Since the proposed estate residential development site occurs within the Oak Ridges Moraine Conservation Plan (ORMCP) Area, the EIS & MP incorporates a Natural Heritage Evaluation (NHE) which is a requirement of both the Oak Ridges Moraine Conservation Plan (ORMCP) and the Town of Caledon Official Plan (Town of Caledon, 2016). The assessment of the Hydrologically Sensitive Features (HSF) within this report relies on the Hydrogeological Assessment Report prepared under a separate cover (Azimuth Environmental Consulting Inc., 2017a).

7.1 Study Approach

Outlined in the EIS & MP is the study approach, project pre-consultation history, and available background data. For this project, three pre-consultation meetings have been held between the proponent and staff from the Town of Caledon, Regional Municipality of Peel, and Toronto and Region Conservation Authority. These meetings occurred in June 2012, and on March 7th, 2013 and January 12th, 2017 with the Town of Caledon Development Application Review Team (DART) and served to identify submission requirements for the Draft Plan of Subdivision application.

7.2 Existing Conditions

7.2.1 On-Site and Adjacent Land Use

The majority of the property is composed of row-crop agricultural lands (i.e., corn/soy), woodland, and wetland communities. Deciduous hedgerows run along portions of the perimeter of the property in addition to a hedgerow which runs through the interior of the site, parallel to Mount Pleasant Road. In the past, the property has been used as a small scale borrow pit operation which, in part, led to the formation of a least one of the wetlands on site. Six wetlands have been identified on site by the Ministry of Natural Resources and Forestry (MNRF) and have been evaluated as part of this project. Subsequent to their evaluation, they have been included within the Mount Wolfe Provincially Significant Wetland (PSW) Complex. There are currently no structures on property. The topography of the property is undulating with moderate to steep slopes.

The existing Diamondwood Subdivision currently resides to the north of the site. Estate residential homes are common within the general area (i.e., Palgrave Estate Residential Area) and exist on either side of the property fronting onto Mount Pleasant Road. A small forest unit abuts the property with row-crop agricultural lands composing the remainder of the lands adjacent to the property.

7.2.2 Environmental Features

A detailed description of environmental features of the site is provided in the EIS & MP. This includes discussion and description of the following either on or adjacent the subject property:

- Vegetation
- Wetlands
- Woodland
- Wildlife habitat
- Aquatics
- Species at Risk

With respect to wetlands, per the Town of Caledon Official Plan: '*where the feature is a wetland….proposed refinements to the boundary or the extent of the feature requires formal confirmation from the Province or delegated authority prior to any development*' (Section 7.1.9.2 Palgrave Estate Residential Community Secondary Plan). Based on this requirement, the Ministry of Natural Resources and Forestry (MNRF) was invited on the property to identify and delineate the wetland features on July 11th, 2012.

The location of site wetland communities is shown on Figure 4 in the EIS & MP and Map 7A provided in Appendix B of this report. A detailed description of wetland community composition and structure, and plant species observed in provided in Table 1 and Table 2 of the EIS & MP, respectively. Data for the wetland communities was collected both by Azimuth Environmental Consulting Inc. and MNRF.

During the site visit on July 11th, 2012 with MNRF staff, the boundaries of each of the wetland features was delineated and subsequently surveyed. A total of 6 wetland communities were identified on the property. The MNRF has designated all wetland units as being Provincially Significant and are a part of the Mount Wolfe Provincially Significant Wetland Complex.

With respect to Species At Risk (SAR), SAR and their preferred habitat were screened to determine whether there is potentially suitable habitat on/or adjacent to the property for the SAR having the potential to occur within the general area. Of the species identified with potential to exist within the general area, the following were identified based on habitat requirements to have potential to exist on/or adjacent to the property.

- Mammals: Little Brown Myotis (END), Northern Long-eared Myotis (END) and Tri-colored Bat (END);
- Insects: Monarch (SC);
- Reptiles: Blanding's Turtle (THR) and Snapping Turtle (SC);
- Birds: Barn Swallow (THR), Canada Warbler (SC), Eastern Wood-pewee (SC), Golden-winged Warbler (SC) and Wood Thrush (SC); and
- Plants: Butternut (END).

The results of breeding bird surveys revealed the presence of the following SAR: Barn Swallow (THR), Bobolink (THR) and Eastern Wood-pewee (SC). The results of the vegetation survey

and search for Butternut revealed the presence of 17 Butternut (END) trees on site. With the exception of those species listed above, no other SAR were confirmed to be present on site or to be utilizing the property.

7.3 Environmental Policy Area Components, Palgrave Estates Policy Area Components and Environmental Zoning

7.3.1 Environmental Policy Area

The Town of Caledon Environmental Policy Area (EPA) components includes all Natural Core Areas and Natural Corridors as outlined within Table 3.1 of the Town of Caledon Official Plan. Provided in Table 8 of the EIS & MP are all of the EPA present on the property and the setback applied to the feature. Depicted in Figure 4 of the EIS & MP are the limits of the recommended EPA.

Palgrave Estates Policy Area 4

There is no Policy Area 4 on the property. A portion of the lands immediately to the north and west are located within the Policy Area 4 designation, which appears to coincide with the buffering lands adjacent to the valley feature located off-property. Policy Area 4 corresponds to the ORMCP Natural Linkage Area designation on Schedule P. The purpose of the Natural Linkage Area is to improve or restore the ecological integrity of the area and to maintain linkages between Natural Core Areas and along river valleys and stream corridors.

As the subject lands are located adjacent to the Policy Area 4 designation, it is concluded in the EIS & MP that the proposed development would have no negative impact to these adjacent lands. The form and function of the Natural Linkage Area would remain intact and function as it has prior to development. The connectivity throughout the stream corridor feature would be maintained. There are no impacts expected from the proposed development on the connectivity of the protected valley feature, associated watercourse (Cold Creek) and fish habitat.

Environmental Zoning (Environmental Zone 1 and Environmental Zone 2)

Provided in Schedule I of the Town of Caledon Official Plan is the environmental zoning for the Palgrave Estate Residential Community. Environmental Zone 1 (EZ1) identifies the more sensitive environmental features including wetlands and stream corridors, and also includes all ORMCP KNHF and HSF (refer to Town of Caledon Official Plan Section 7.1.9.1). Per Town of Caledon Official Plan Section 7.1.9.4, no part of a Structure Envelope will be permitted in EZ1 areas. Several areas of the property have been identified as EZ1, and are associated with the identified Significant Wetlands, Significant Woodland, and other KNHF/HSF contained within these features (confirmed and candidate) and the associated MVPZs (refer to Figure 4 in the EIS & MP, and Map 7A and Map 8 provided in Appendix B of this report). There is no development located within the EZ1 areas of the property.

Environmental Zone 2 (EZ2) includes areas of high ground water table (where the water table is usually within 1.5 metres or less of the ground surface); areas of seasonal flooding (not including regulated floodplains); dry swale lowlands and natural depressions which perform natural runoff, detention and ground water recharge functions; and, smaller hedgerows and strips of native vegetation (Town of Caledon Official Plan Section 7.1.9.1). EZ2 area has been identified on the property. Per the Town of Caledon Official Section 7.1.9.5, no part of a Structure Envelope will be permitted in EZ2 except for short sections of driveways which may cross short sections of EZ2 if necessary, no other development is permitted within unless included within the driveway portion of a structural envelope crossing. As documented within Hydrogeologic Assessment Report for the proposed Laurelpark Subdivision (Azimuth Environmental Consulting Inc., 2017a), the EZ2 boundaries were refined by more detailed ground survey elevations, water level measurements from a combination of monitoring wells, geotechnical boreholes and on-site observations. In addition, local grading for the development will result in small changes to the EZ2 boundaries as has been shown in Figure 5 of the EIS & MP. As shown in Figure 5 of the EIS & MP, no development feature will cross any of the refined EZ2 areas within the property.

It is recognized that within the definition of EZ2, it includes smaller hedgerows and strips of native vegetation. Due to the current environmental constraints on the property, and the location of the proposed location of driveways (permitted use within EZ2) identifying the hedgerow running parallel to Mount Pleasant Road towards the northern portion of the property would significantly limit the potential lot configurations for the proposed estate residential development. The following provides rationale for not including the hedgerow as EZ2:

- Are not considered to be a KNHF according to the ORMCP;
- Hedgerows are not an Ecosystem Component according to the TCOP;
- Hedgerows (narrow, linear treed areas) are excluded from the definition of Significant Woodland according to OMNR's Natural Heritage Reference Manual (2010);
- Hedgerows provide an effective windbreak for agricultural operations but provide limited ecological value;
- Narrow, linear hedgerow provides limited cover for wildlife. Primarily suitable for edge adept species; and
- Hedgerow provides no connectivity function as adjacent connecting lands are residential.

Therefore, the inclusion of the hedgerow within the EZ2 lands is not recommended. Based on assessment and as per the recommendations outlined within the Tree Inventory and Assessment Report (Azimuth Environmental Consulting Inc., 2017c), it is recommended that where possible, healthy non-hazard hedgerow trees be preserved within the proposed lots. Recommended in the Tree Inventory and Assessment Report is a compensation ration of 2:1 (i.e., 2 compensation trees for every 1 healthy tree removed). The compensation plantings should be placed within the MVPZ that are currently void of native vegetation (i.e., currently agricultural lands). Overall, this will benefit the form and function of the identified KNHF/HSF on the property by enhancing the MVPZ and providing additional benefits that may include

enhancing water quality function and provision of a screen to edge effects of human disturbances.

Similarly, it is recognized that "dry swale lowlands that perform natural runoff, detention and ground water recharge function" are included within the EZ2 definition. An ephemeral drainage feature has been identified in proximity to Mount Pleasant Road that conveys storm flows to a man-made pond at either end of the swale. As per Azimuth's 2017 Headwater Drainage Feature Assessment, this feature represents a topographic low on the landscape and was dry at the time of the site visits, with no visible flows observed. Currently, this area is being actively farmed (*i.e*. cultivated crops). The surficial soils on the property are primarily silty and infiltration is low to moderate (30-50% of surplus). As such, this feature should not be designated as EZ2. Nonetheless, surface flows on the property will be maintained. As per TRCA/CVC guidelines, dry swale is classified as "Mitigation" as this feature only provides a contributing hydrology function. Mitigation recommendations are presented within Azimuth's abovementioned report. Based on the current proposed development, it is concluded that flow conveyance will be maintained via a vegetated swale. Therefore, the function of the dry swale (*i.e.,* flow conveyance) will be maintained as per the TRCA/CVC guidelines (2014).

Contiguous connections between EZ1 and EZ2 should be provided to the greatest extent practical (Town's OP Section 7.1.9.6). In general, new subdivision roads and services will not be permitted in Policy Area 4 or EZ1, except where stream crossings and extensions into KNHF are minimized (Section 7.1.9.38). There is no Policy Area 4 on the property. There are no road or driveway crossings proposed within EZ1 lands (Figure 5). With the exception of the isolated pond adjacent to Mount Pleasant Road and its associated EZ2 zone, all of the identified EZ1 and EZ2 zones are contiguous.

Refined EPA and EZ Limits

Illustrated in Figure 4 of the EIS & MP are the limits of the EPA defined according to the location of the natural heritage components determined through an analysis of background and site-specific data. The recommended EPA limit includes the full extent of MVPZ setbacks specified by the ORMCP. The limits of the EZ1 and EZ2 areas shown on Schedule I of the Town of Caledon Official Plan can undergo minor refinements based on site specific condition without amendment to the Official Plan (refer to Section 7.1.9.2). The EZ1 areas are associated with the PSW (on-property), MNRF identified wetland (off-property), intermittent watercourse, woodland and their associated MVPZ. The EZ2 areas are associated with the areas of high ground water table.

7.4 Policy Conformity

7.4.1 Provincial Policy Statement (2014)

The proposed estate residential development can be achieved with no direct impact to significant natural heritage features as identified according to Section 2.1 of the Provincial Policy Statement (PPS). The proposed estate residential development is consistent with the wise use and management of resources section of the PPS.

7.4.2 Provincial Greenbelt Plan

The property is entirely within the limits of the ORMCP. Based on the provisions outlined within the Greenbelt Plan, only Section 3.3 of the Greenbelt Plan as it deals with Parkland, Open Space and Trails apply to the property.

7.4.3 Oak Ridges Moraine Conservation Plan

The property is within the Palgrave Estate Residential Community, a component of the Countryside Area. The proposed estate residential development can be achieved with no direct impact to any of the KNHF's or HSF's identified in the EIS & MP (Azimuth Environmental Consulting Inc., 2017b) and Hydrogeologic Assessment Report (Azimuth Environmental Consulting Inc., 2017a). A 30 metre minimum vegetation protection zone (MVPZ) will remain adjacent to each of the identified features.

Therefore, it is stated in the EIS & MP that the proposed estate residential development is consistent with the objectives of the ORMCP (Section 12(1) and Section 13(4)) as they apply to Countryside (Palgrave Estates Residential Community) areas and the connectivity of KNHF's is maintained.

The proposed estate residential development does not occur within a HSF or related MVPZ. It is indicated in the Hydrogeologic Assessment Report (Azimuth Environmental Consulting Inc., 2017a) that there will be little quantifiable impact to ground water infiltration and therefore the source-pathway-receptor profile will be maintained. In turn, this will not be quantifiable at any of the downgradient receivers.

The proposed development of the estate residential development property conforms to the Landform Conservation Area 2 designation by keeping disturbance to landform character to a minimum.

The proposed estate residential development conforms to the Aquifer Low Vulnerability Area designation because the development concept does not include any of the prohibited land uses listed by the ORMCP.

7.4.4 Region of Peel

The relevant policies within the Region of Peel Official Plan were reviewed. Since the Region of Peel Official Plan states that municipal official plans and zoning bylaws must conform to the ORMCP, it has been assumed in the EIS & MP that in addressing conformity to environmental policies on the part of the Town of Caledon, also addressed is environmental policy conformity on the part of the Region of Peel.

Through adhering to the policies as outlined within the Town of Caledon Official Plan and the ORMCP, identified and protected on the property would be all of the KNHF that would be a part of the Region's Greenlands System.

7.4.5 Town of Caledon

The EIS & MP has identified a range of features that would be considered Natural Core Areas in the context of the Town of Caledon Official Plan. All of these features have been fully included in an area that recommended to be considered an EPA. As per Section 3.2.5 of the Town of Caledon Official Plan, documented in the EIS & MP are evaluated components of the Environmental Framework identified by the municipality that occur within the property, and provided is an assessment of potential impacts on each according to the Town's performance measures. It is indicated by the assessment that the proposed development can be achieved with no direct, indirect or cumulative impacts to any of the components, all of which are included in the recommended limits of the EPA.

7.4.6 Endangered Species Act, 2007

The results of the EIS & MP, demonstrate that the proposed development will not negatively impact KNHF/HSF or ecological functions present on or adjacent to the property – including habitat of END and THR species assuming that the recommended mitigation measures are followed. MNRF has been consulted through submission of an IGF and have been involved with the discussions surrounding the Butternut prematurely removed from the property. Based on correspondence to-date, compensation in the form of a planting plan will be required for the loss of the 4 'retainable' Butternut individuals.

7.4.7 Toronto and Region Conservation Authority

The proposed estate residential development does not affect the Significant Wetland that has been identified on site. All lands within 120 metres of a PSW are currently regulated by the TRCA under Ontario Regulation 166/06 (*i.e.,* the "Alteration for Development, Interference with Wetlands & Alterations to Shorelines and Watercourses). Therefore, a permit from the TRCA to build within the "regulated area" appears necessary.

7.5 Conclusions

The results of the EIS & MP have identified KNHF and HSF on and adjacent to the property including:

- Significant Woodland;
- Significant Wetland;
- Potential and confirmed habitat for END or THR Species: END bat species, Butternut (END), Blanding's Turtle (THR) and Barn Swallow (THR);
- Candidate SWH (Bat Maternity Colony, Turtle Overwintering, Reptile Hibernaculum, Turtle Nesting, Marsh Breeding Bird Habitat and Habitat for Species of Conservation Concern);
- Permanent and Intermittent Streams;
- Fish Habitat
- Significant Valleylands (off-property); and
- HSFs (wetland, permanent stream (off-property) and intermittent stream).

The proposed Laurelpark Subdivision will maintain a 30 metre natural self-sustaining MVPZ adjacent to each of the identified KNHF/HSF. The assessment of the proposed MVPZ within Section 11.1 of the EIS & MP indicates that the proposed 30 metre MVPZ is sufficiently large to protect the overall form and function of the confirmed and candidate features. The recommended EPA lands encompass all of the identified KNHF and HSF in addition to the 30 metre MVPZ.

Recommendations related to SAR, general construction mitigation and migratory breeding birds have been made within Section 12 of the EIS & MP. Provided that the recommendations within the EIS & MP are adhered to, it is stated that the proposed Laurelpark Subdivision can be constructed with no negative environmental impacts to the identified ORM KNHF's, HSFs and the resulting recommended EPA lands.

Furthermore, policy conformity analysis indicates that provided the recommended mitigation measures are adhered to, the proposed Laurelpark Subdivision meets the requirements of the PPS, Ontario's ESA, ORMCP, TRCA and Regional and local Official Plans.

8.0 HEADWATER DRAINAGE FEATURE ASSESSMENT

Given that the proposed estate residential development site occurs within a Toronto and Region Conservation Authority (TRCA) regulated area, any alteration to potential headwater features is regulated by Ontario Regulation 166/06 under the Conservation Authorities Act. A headwater drainage feature assessment was conducted by Azimuth Environmental Consulting Inc. (2017d) to evaluate the potential headwater features located on the property, identify any potential impacts to the function of the headwater features, and provide a series of mitigation strategies to help reduce and/or eliminate potential impacts to any potential headwater features.

8.1 Existing Conditions

There is one offline pond, and no permanently flowing watercourses on the property. Three headwater drainage features have been identified within the study area (north, central, and south) as shown on Figure 2 in the Assessment. The north feature is a vegetated swale that splits flow between two offline ponds. Therefore, half of the feature drains west to a pond feature in the northwest corner, and the other half drains east into an offline pond along the eastern border of the property. The central feature is located in a hedgerow that dissects the property in the centre. Two small branches of the central features meet in the hedgerow and exit the property to the east. The southern feature is poorly defined and originates in a lowland treed area along the eastern border of the property. The southern feature exits the property to the east and connects with the central feature before flowing southeast.

Figure 2 is provided in Appendix B of this report.

8.2 Hydrology Classification

All headwater features in the study area were dry at the time of the site visits, with no visible flows observed. Additionally, all headwater features are poorly defined and have been significantly impacted from agricultural activities (i.e., cropped fields). Therefore, the headwater drainage features on the site can be classified as providing contributing indirect habitat to downstream aquatic environments. Based on field observations of surface flow, the central feature can be characterized as an intermittent feature, while the north and south features would be ephemeral.

8.3 Riparian Classification

The study area has been significantly impacted from agricultural activities. Therefore, riparian vegetation is limited on the property. The north feature has no riparian vegetation as it flows through an actively cropped field. However, the central and south features are bordered by thicket swamp vegetation. Therefore, these two drainage features are classified as having “Important” riparian vegetation.

8.4 Fish and Fish Habitat Classification

No fish habitat was observed throughout any drainage feature on the property. All features were dry during the site visits and are poorly defined. Therefore, all features function as contributing indirect fish habitat.

8.5 Terrestrial Habitat Classification

No terrestrial habitat is present adjacent to the north drainage feature, and is classified as limited in its function. However, the central and south drainage features have amphibian breeding habitat present as determined by Azimuth Environmental Consulting Inc. staff. Therefore, these features are classified as "Important" in accordance with the Toronto Region Conservation Authority/Credit Valley Conservation guidelines (2014).

8.6 Report Recommendations

All drainage features in the study area were identified as providing indirect fish habitat. However, the central and south drainage features have important terrestrial features due to the presence of amphibian breeding habitat. Therefore, these features are classified as "Conservation" in accordance with the Toronto Region Conservation Authority/Credit Valley Conservation guidelines. The north drainage feature was classified as "Mitigation" as this feature only provides a contributing hydrology function.

As per the Toronto Region Conservation Authority/Credit Valley Conservation guidelines (2014), the recommended management for "Conservation" and "Mitigation" designated drainage features are as outlined below.

Conservation – Valued Functions (e.g., seasonal fish habitat with woody riparian cover; marshes with amphibian breeding habitat; or general amphibian habitat with woody riparian cover):

- Maintain, relocate, and/or enhance drainage feature and its riparian zone corridor;
- If catchment drainage has been previously removed or will be removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage), as feasible;
- Maintain or replace on-site flows using mitigation measures and/or wetland creation, if necessary;
- Maintain or replace external flows,
- Use natural channel design techniques to maintain or enhance overall productivity of the reach;
- Drainage feature must connect to downstream.

Mitigation – Contributing Functions (e.g., contributing fish habitat with meadow vegetation or limited cover):

- Replicate or enhance functions through enhanced lot level conveyance measures, such as well-vegetated swales (herbaceous, shrub and tree material) to mimic online wet vegetation pockets, or replicate through constructed wetland features connected to downstream;
- Replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales, etc. If catchment drainage has been previously removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage);
- Replicate functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact Development (LID) stormwater options (refer to Conservation Authority Water Management Guidelines for details).

8.7 Impact Assessment

As shown in Figure 3 in the Headwater Drainage Feature Assessment, the proposed development will not alter the central and south drainage features, which were designated as "Conservation" in accordance with the Toronto Region Conservation Authority/Credit Valley Conservation guidelines (2014). Therefore, the key natural heritage features of the drainage features (i.e., breeding amphibian habitat) should not be impacted as a result of the development. Figure 3 is provided in Appendix B of this report.

The northern drainage feature (Management Recommendation – Mitigation) will be altered to accommodate the proposed development. Flow will continue to be conveyed in a vegetated swale between the new subdivision lots. Therefore, the function of this feature (i.e., flow conveyance) will be maintained as per the Toronto Region Conservation Authority/Credit Valley Conservation guidelines (2014).

8.8 Construction Mitigation

A series of construction mitigation measures are identified in the Headwater Drainage Feature Assessment to minimize the impact on headwater features on the property. These mitigation measures include the following:

- Timing restrictions
- Isolation of Construction Area
- Sediment and Erosion Controls
- Monitoring
- Site Restoration
- Operations (i.e., general guidelines pertaining to equipment maintenance and spill management)

8.9 Conclusion

It is concluded in the Headwater Drainage Feature Assessment that the proposed development will not have significant impacts on headwater features on the property if the appropriate mitigation measures are followed during construction and that proposed works will be completed in a manner that satisfies the requirements of the Toronto Region Conservation Authority/Credit Valley Conservation guidelines (2014) for the protection of headwater drainage features.

In addition, it is stated that the continued conveyance of the existing ephemeral and intermittent flows will be maintained and the breeding amphibian habitat will remain unaltered post-development, and that final site conditions should result in similar flows, in both quantity and quality, being conveyed downstream to areas of potential fish habitat.

9.0 TREE INVENTORY AND ASSESSMENT REPORT

A Tree Inventory and Assessment Report was prepared by Azimuth Environmental Consulting (2017c). The purpose of the report was to complete an inventory of all tree specimens located within the proposed area of development on the property with a diameter at breast height (dbh) of at least 20 centimetres (cm), provide recommendations pertaining to which trees should be retained/removed, and identify compensation options.

9.1 Tree Resource Description

A total of 55 trees were documented within the proposed development limits during the inventory process. The site contained a variety of naturally occurring native and non-native species. Overall, the tree inventory consisted of the species itemized in Table 8.1.

TABLE 8.1
TREE RESOURCE COMPOSITION

Tree Species Common Name (*Scientific Name*)	**Status**	**# Healthy Specimens Found**
Sugar Maple (*Acer saccharum*)	Native	12
Black Cherry (*Prunus serotina*)	Native	10
Bur Oak (*Quercus macrocarpa*)	Native	9
White Oak (*Quercus alba*)	Native	5
English Oak (*Quercus robur*)	Non-Native	2
American Elm (*Ulmus americana*)	Native	5
White Ash (*Fraxinus americana*)	Native	3
Eastern Hemlock (*Tsuga canadensis*)	Native	2
Eastern White Cedar (*Thuja occidentalis*)	Native	1
White Birch (*Betula papyrifera*)	Native	1
Black Walnut (*Juglans nigra*)	Native	1
Norway Maple (*Acer platanoides*)	Non-Native	2
White Mulberry (*Morus alba*)	Non-Native	1
Manitoba Maple (*Acer negundo*)	Non-Native	1

The health status of the trees varied, with 33 healthy specimens found and 22 specimens found to be in a state of stress/decline (<70% live canopy) or considered an invasive species (i.e. Manitoba Maple).

The site also contains densely treed areas surrounding the wetlands within the central portion of the property, although these trees will be protected within a designated 30 metre buffer (extending outward from each wetland perimeter). A woodlot feature is also located along a portion of the southeastern property boundary, which is also protected by a 30 metre buffer. All trees within these buffer zones were not inventoried as they will be protected from development impacts.

It should also be noted that 17 Butternut (Endangered) trees were identified on the property and were assessed previously by Azimuth staff. All Butternut trees remaining on-site (following removal of a portion of the Butternut trees) will be protected within the designated wetland/woodland buffer areas and will not be subject to development/construction impacts. For more information regarding the Butternut trees identified on-site, please refer to Azimuth's Environmental Impact Study and Management Plan (2017b) for the subject property.

9.2 Tree Removal/Preservation Recommendations

As stated in the previous section, a total of 55 trees (33 healthy, 22 declining/invasive) were found within the limits of the proposed development. The 22 trees found to be of declining health should be considered hazard trees, which are specimens showing signs of poor health and are prone to failure, causing a risk to public safety/property. These trees should be removed prior to any on-site construction.

It is recommended that all of the healthy trees that will not be impacted by the proposed development (dwellings, roads, grading, etc.) be retained, including trees #46, #47, #48, #49, #50, #51 and #55. All other trees are proposed to be impacted by construction (i.e. roads, dwellings, stormwater management area, grading, etc.).

The neighbouring residential property to the southeast also has several mature trees growing in the front yard, with portions their root zones likely extending into the subject site. It is recommended that tree protection fencing be installed 3 metres offset from the southeastern property boundary (see Figure 2) adjacent to these trees to ensure minimal impact to their respective root zones. No construction activities such as paving, building construction, excavating, filling or equipment storage would be permitted within this root protection area.

A minimum protection zone (MPZ) has been calculated for each tree to be protected/preserved during construction, which estimates the extent of tree root zone based on the diameter at breast height. The formula accepted by the International Society of Arboriculture (1 inch dbh = 1 foot MPZ) was used to determine the recommended root protection zone for each tree. For example, the dbh for Tree #47 was measured as 20cm, which converts to 7.9 inches. Thus, the MPZ for Tree #47 is a radius of 7.9 feet (2.4 metres) surrounding the base of the trunk. MPZ radius measurements for all trees to be retained are listed in Appendix B and shown in Figure 3.

Protective fencing (following OPSD – 219.130 or equivalent) with the trench required to install the geotextile excavated on the "development" side of the fence should be constructed around the perimeter of each MPZ to ensure that the root zone of each preserved tree is protected. If there are overlapping MPZ's, fencing should be constructed around the grouping of trees to be protected. This protective fencing should be installed prior to any on-site construction. Also, no construction equipment (heavy machinery, tools, etc.) or materials (fuel, adhesives, cleaners, etc.) should be stored within each MPZ.

Care must be taken by the contractor when removing trees within the root protection zones of nearby retainable trees. These trees should be removed prior to the installation of protective fencing, and must be felled in an area clear of retainable trees (if possible). If the tree to be removed is surrounded by retainable trees, the contractor must carefully remove the trees in sections, working from the top of the canopy to the ground. Stumps and roots of removed trees should not be torn from the ground to ensure minimal disturbance occurs within the root protections zone.

9.3 Tree Compensation Recommendations

A total of 48 trees are proposed for removal due to these specimens having the potential to be impacted by the proposed development, or due to poor health condition. A total of 28 of the 48 trees to be removed are in good/healthy condition.

The Town of Caledon tree compensation ratio is 2:1 (i.e. 2 compensation trees for every 1 healthy tree removed). To comply with this ratio, the landowner would provide a total of 56 native trees to compensate for the loss of 28 healthy trees being removed. As there is a large area of environmental protection area proposed within the subject property, the compensation trees can be planted in the most suitable portions of this area based on conditions such as tree species, sunlight availability and soil moisture.

REFERENCES

Azimuth Environmental Consulting Inc. 2017a. Hydrogeologic Assessment Report, Laurelpark Subdivision, Part of Lot 19, Concession 6, Town of Caledon (Albion). Report prepared for Harbour View Investments Ltd., June 2017.

Azimuth Environmental Consulting Inc. 2017b. Environmental Impact Study and Management Plan, Laurelpark Subdivision, Part of Lot 19, Concession 9, Town of Caledon, Regional Municipality of Peel. Report prepared for Laurelpark Inc., June 2017.

Azimuth Environmental Consulting Inc. 2017c. Tree Inventory and Assessment Report, Laurelpark Subdivision, Part of Lot 19, Concession 6, Town of Caledon (Albion), Town of Caledon, Region of Peel. Report prepared for Harbour View Investments Ltd., May 2017.

Azimuth Environmental Consulting Inc. 2017d. Headwater Drainage Feature Assessment, Laurelpark Subdivision, Part of Lot 19, Concession 9, Town of Caledon, Regional Municipality of Peel. Letter Report prepared for Ventawood Management Inc., June 26th, 2017.

Calder Engineering Ltd. 2017. Preliminary Engineering and Stormwater Management Report. Report prepared for Laurelpark Inc., June 2017.

Chapman L.J. and D.F. Putnam. 1984. The Physiography of Southern Ontario. 3rd Edition, OGS Special Volume 2, Ministry of Natural Resources.

Credit Valley Conservation and Toronto and Region Conservation. 2010. Low Impact Development Stormwater Management Planning and Design Guide. Version 1.0.

Greater Golden Horseshoe Area Conservation Authorities. 2006. Erosion & Sediment Control Guideline for Urban Construction. December 2006.

Ministry of Environment. 2003. Stormwater Management Practices Planning and Design Manual. March 2003.

Region of Peel. 2010. Public Works Design, Specifications and Procedures Manual, Linear Infrastructure, Watermain Design Criteria. Revised June 2010.

Terraprobe Inc. 2017. Geotechnical Investigation, Proposed Residential Development, Palgrave Estates II (Part of the East Half of Lot 19, Concession 8, Regional Municipality of Peel), Caledon, Ontario. Report prepared for Laurelpark Inc., April 24th, 2017.

Toronto and Region Conservation Authority and Credit Valley Conservation. 2014. Evaluation, Classification and Management of Headwater Drainage Features Guidelines. January 2014.

Town of Caledon. 2016. Town of Caledon Official Plan. November 2016 Consolidation.

Town of Caledon. 2009. Development Standards, Policies & Guidelines, Town of Caledon. Prepared by the Town of Caledon Public Works & Engineering Department, Version 4. January 2009.

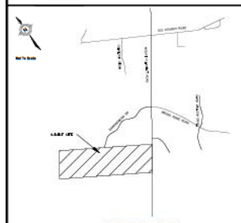
APPENDIX A

DRAFT PLAN AND SURFACE HYDROLOGY MAP

DRAFT PLAN OF SUBDIVISION

LAURELPARK ESTATES

SKETCH OF
PART OF THE EAST HALF OF LOT 19, CONCESSION 8
(GEOGRAPHIC TOWNSHIP OF ALBION)
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL



KEY MAP - N.T.S.

BENCHMARK

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) - AS LISTED BELOW
(e) - AS SHOWN
(f) - AS SHOWN
(g) - AS SHOWN
(h) - MUNICIPAL WATER
(i) - GLACIAL TILL
(j) - AS SHOWN
(k) - SEPTIC SANITARY AND STORM SEWERS
(l) - NONE

SURVEYOR'S CERTIFICATE

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

SIGNED _____

DATE _____

OWNER'S CERTIFICATE

I HEREBY CONSENT TO THE FILING OF THIS PLAN BY IBI GROUP, IN DRAFT FORM.

SIGNED _____
MARK CROWE
HARBOUR VIEW INVESTMENTS LIMITED

DATE _____

LAND USE SCHEDULE

LOTS/BLKS	LAND USE	AREA ha	POTENTIAL # OF UNITS MIN	MAX
RESIDENTIAL				
LOTS 1-8	ESTATE RESIDENTIAL	4.44	8	8
BLKS. 1-2	OPEN SPACE	5.28		
BLK. 3	COMMON ELEMENT	0.14		
BLK. 4	ROAD WIDENING	0.04		
BLK. 5	SWM	0.08		
ROW		0.40		
TOTAL		10.38	8	8

#	DATE	BY	DESCRIPTION
			REVISIONS

APPROVALS

APPROVED: DATE:

DESIGNED BY:	GD	DATE:	20170613
DRAWN BY:	GD	FILE NUMBER:	30477
CHECKED BY:	SA	SHEET NUMBER:	DP1

IBI GROUP
308 - 30 Eglinton Avenue West
Mississauga ON L5R 3E7 Canada
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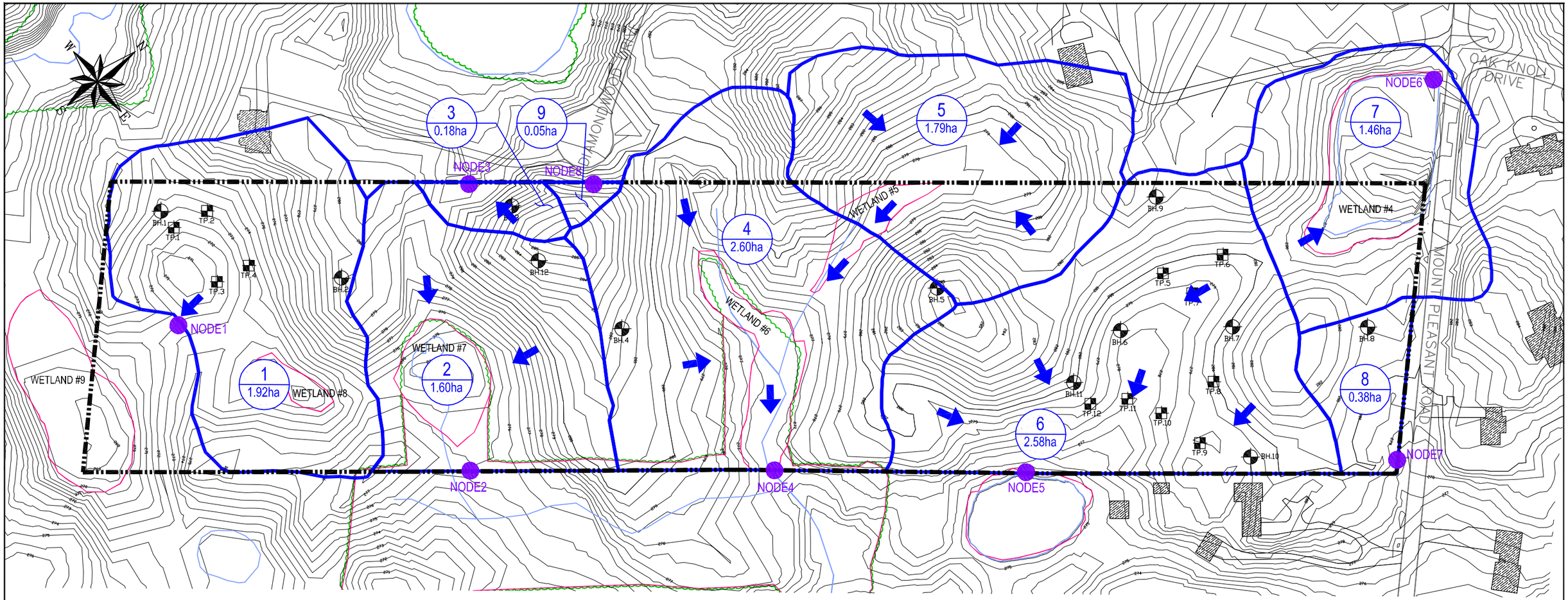
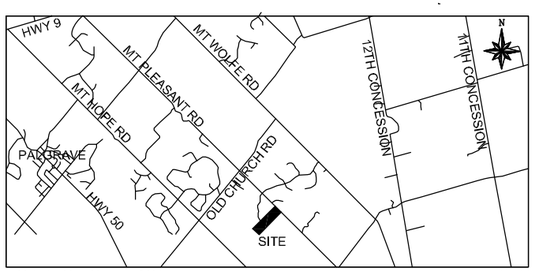


KEY PLAN



TOWN OF CALEDON NTS

LEGEND

- SITE BOUNDARY
- STREAM OR WATER BODY
- 279 MAJOR CONTOUR (1m INTERVALS)
- DRAINAGE BOUNDARY
- 3 / 2.57ha — SUB-CATCHMENT ID / SUB-CATCHMENT AREA (ha)
- MAJOR FLOW DIRECTION
- BH.4 BOREHOLE LOCATION
- TP.4 TEST PIT LOCATION
- NODE1 FLOW NODE
- ORMCP KEY NATURAL HERITAGE FEATURE

NOTES

1. CONTOURS GENERATED FROM ORTHOPHOTOGRAPHY DEVELOPED IN THE SPRING OF 2002 AND SURVEYED ELEVATIONS BY CALDER ENGINEERING LTD. (2017) AND EPLETT WOROBEC RAIKES SURVYING LTD. (2015). ACTUAL ELEVATIONS MAY VARY FROM THOSE SHOWN.
2. MAJOR CONTOUR INTERVAL IS 1m. MINOR CONTOUR INTERVAL IS 0.5m.
3. FEATURE LOCATIONS (e.g. TREELINES, BUILDINGS, ETC.) ARE APPROXIMATE.

50m 0 50m 100m

SCALE 1:2000

Calder Engineering Ltd.
T 905-857-7600 W www.calderenq.com

THE CORPORATION OF THE TOWN OF CALEDON

LAURELPARK INC.

LAURELPARK SUBDIVISION
PART OF EAST HALF OF LOT 19, CONCESSION 8
TOWN OF CALEDON, REGION OF PEEL

MAP 5
SURFACE HYDROLOGY MAP

APPENDIX B

VEGETATION AND WILDLIFE ECOLOGY MAP AND ENVIRONMENTAL SUMMARY MAP

LEGEND:

- Approx. Property Boundary
- Hedgerows
- Permanent Stream
- Intermittent Stream
- Ephemeral Drainage
- Mount Wolfe Provincially Significant Wetland (PSW)
- MNR Identified Wetland
- Retainable Butternut Trees (white)
- Butternut Trees (non-retainable)
- Butternut Trees (Compensation Required)

Upland Vegetation Communities

- CUM1-1 Dry-Moist Old Field Meadow Type
- FOD3-1 Dry-Fresh Poplar Deciduous Forest Type
- FOD4-2 Dry-Fresh White Ash Deciduous Forest Type

Wetland Vegetation Communities

- MAM3-2 Reed Canary Grass Organic Meadow Marsh Type
- MAS2-1 Cattail Mineral Shallow Marsh Type
- SAF1-3 Duckweed Floating-Leaved Shallow Aquatic Type
- SAS1-3 Stonewort Submerged Shallow Aquatic Type
- SWD3-2 Silver Maple Mineral Deciduous Swamp Type
- SWT2-5 Red-osier Mineral Thicket Swamp Type

- Amphibian Survey Stations
- Bird Survey Stations
- # Wetland Number (white)
- Bobolink/Meadowlark Point Count Station (2013)

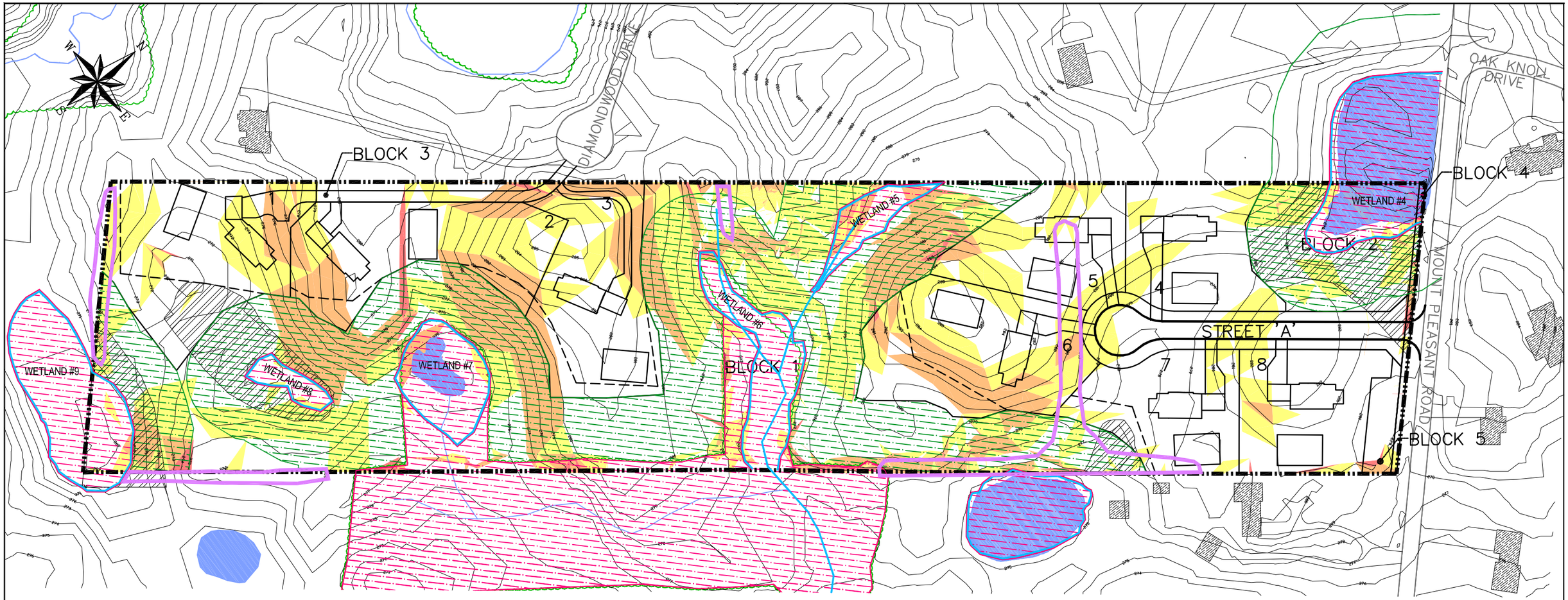
DAYSTAMP: P:\08-019 Mount Pleasant\Drafting\dwg\08-019 FiguresV3.dwg

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Vegetation and Wildlife Ecology

Natural Heritage Evaluation
Pt. Lot 19, Con. 8, Caledon

Date Issued:	March 2017	Map No. 7a
Created By:	JLM	
Project No.	08-019	
Reference:	First Base Solutions	



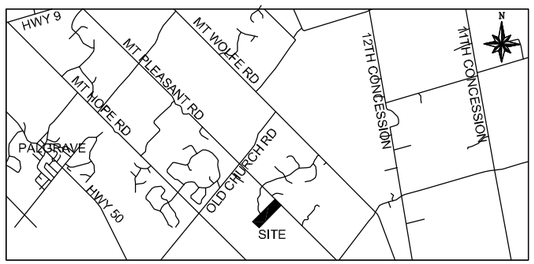
NOTES

1. CONTOURS GENERATED FROM ORTHOPHOTOGRAPHY DEVELOPED IN THE SPRING OF 2002 AND SURVEYED ELEVATIONS BY CALDER ENGINEERING LTD. (2017) AND EPLETT WOROBEC RAIKES SURVEYING LTD. (2015). ACTUAL ELEVATIONS MAY VARY FROM THOSE SHOWN.
2. CONTOUR INTERVAL IS 1m.
3. FEATURE LOCATIONS (e.g. TREELINES, BUILDINGS, ETC.) ARE APPROXIMATE.

50m 0 50m 100m

SCALE 1:2000

KEY PLAN



TOWN OF CALEDON NTS

LEGEND

- SITE BOUNDARY
- PROP. LOT/BLOCK
- STRUCTURE ENVELOPE
- EXISTING BUILDING
- TREE LINE
- EXISTING SURFACE WATER
- EXISTING PAVED ROAD
- 279 MAJOR CONTOUR (1m INTERVALS)
- HEDGEROW (ENVIRONMENTAL ZONE 3)
- EZ2 AREAS
- POORLY DRAINED OR VERY POORLY DRAINED AREAS
- SOILS WITH RAPID AND RESTRICTED PERCOLATION RATES

SLOPES

- 0 TO 10%
- 11 TO 15%
- 15 TO 25%
- > 25%

SEASONALLY HIGH WATER TABLE (ENVIRONMENTAL ZONE 2)

- WATER TABLE 0 TO 0.5m BELOW GROUND SURFACE
- WATER TABLE 0.5 TO 1.5m BELOW GROUND SURFACE

OAK RIDGES MORAINE CONSERVATION PLAN FEATURES

- KEY NATURAL HERITAGE FEATURE (ENVIRONMENTAL ZONE 1)
- 30m MINIMUM VEGETATION PROTECTION ZONE (ENVIRONMENTAL ZONE 1)
- HYDROLOGICALLY SIGNIFICANT FEATURE
- REGIONAL FLOOD LINE
- REGIONAL FILL LINE

Calder Engineering Ltd.
T 905-857-7600 W www.calderenq.com

THE CORPORATION OF THE TOWN OF CALEDON

LAURELPARK INC.

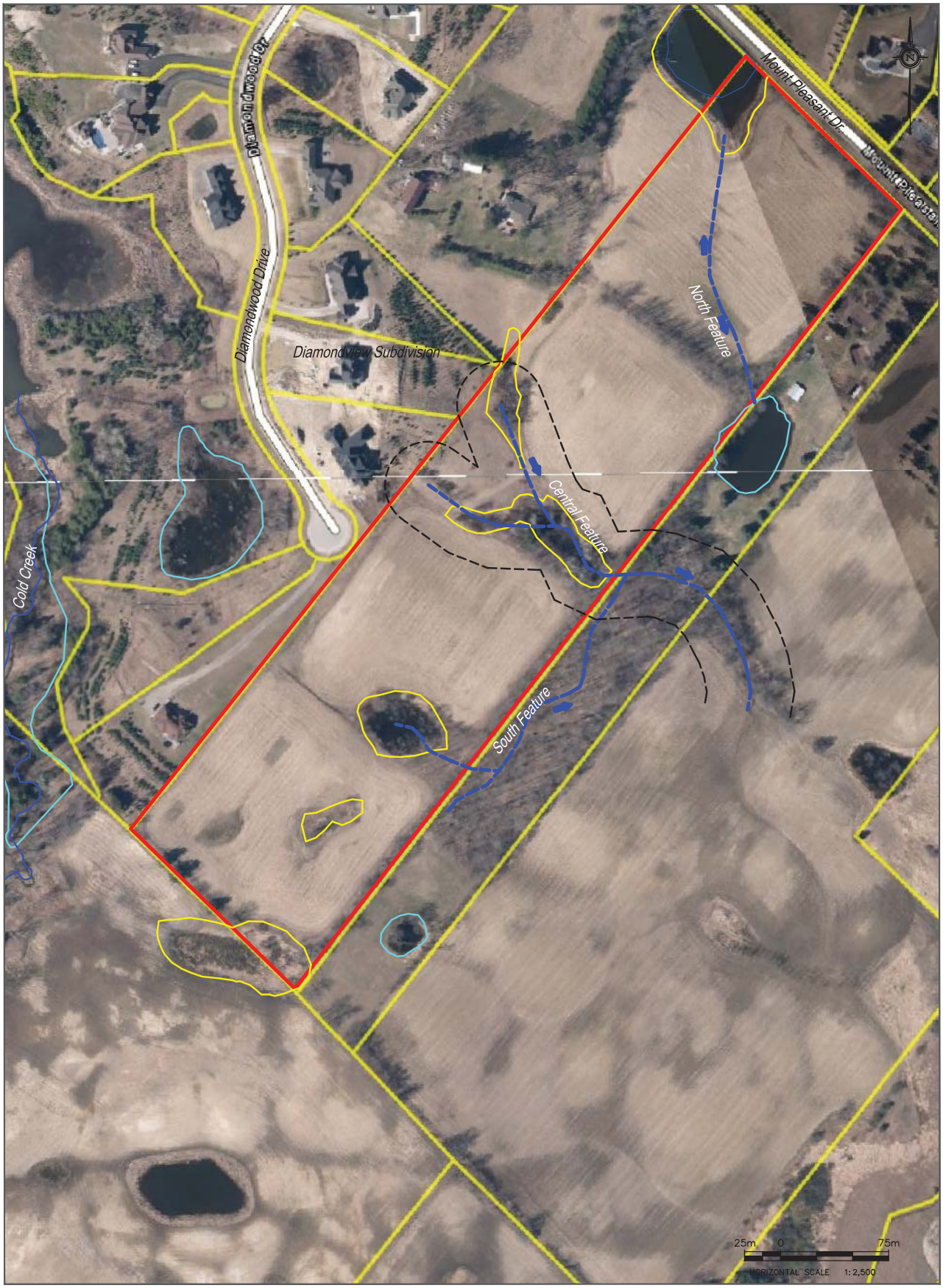
LAURELPARK SUBDIVISION
PART OF EAST HALF OF LOT 19, CONCESSION 8
TOWN OF CALEDON, REGION OF PEEL

MAP 8
ENVIRONMENTAL SUMMARY MAP

APPENDIX C

HEADWATER DRAINAGE FEATURE ASSESSMENT

FIGURE 2 AND FIGURE 3



LEGEND:

- Approx. Property Boundary
- Headwater Drainage Features
- Flow Direction
- Mount Wolfe Provincially Significant Wetland (PSW)
- MNR Identified Wetland

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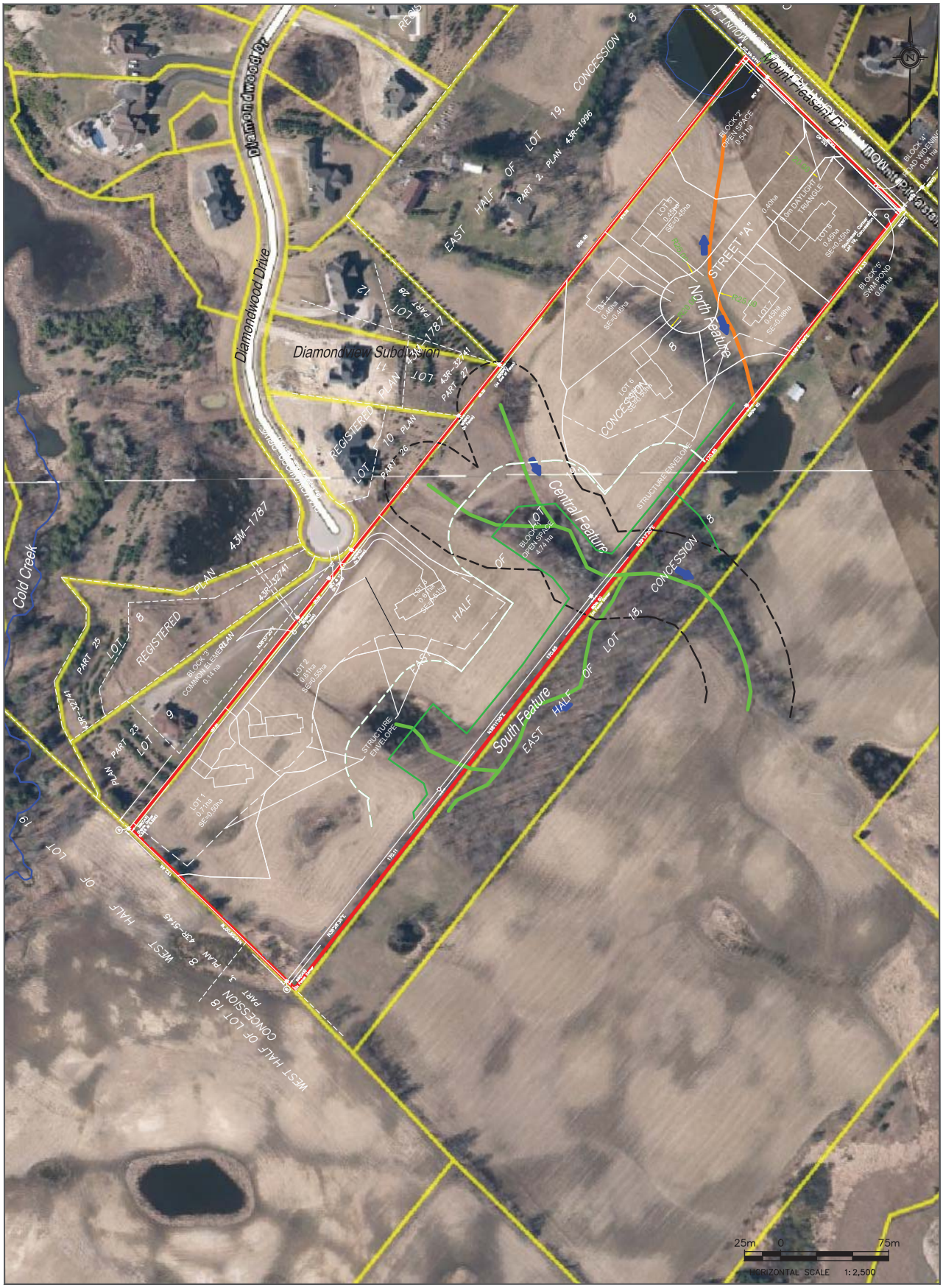
AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Headwater Drainage Features

Pt. Lot 19, Con. 8
Town of Caledon

Date Issued:	March 2017	Figure No.
Created By:	JLM	2
Project No.	08-019	
Reference:	First Base Solutions	



LEGEND:

- Approx. Property Boundary
- Permanent Stream
- Flow Direction

HDF Management Recommendation

- Mitigation
- Conservation

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AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Proposed Development Plan and HDF Management Recommendation

Pt. Lot 19, Con. 8
Town of Caledon

Date Issued:	March 2017	Figure No.
Created By:	JLM	3
Project No.	08-019	
Reference:	First Base Solutions	