2/14/2022

1600 Kerns Road City of Burlington

Environmental Impact Assessment

Fieldgate Properties Limited

PLAN B Natural Heritage
176 FELLOWES CRESCENT WATERDOWN ON L8B 0M9

TABLE OF CONTENTS

LIST OF FIGURES (attached)

APPENDICES

1.0 INTRODUCTION & BACKGROUND

The following Environmental Impact Assessment (EIA) has been prepared for a proposed re-development of an existing commercial property located at 1600 Kerns Road in the City of Burlington. A 4-storey retirement home with at-grade/underground parking and outdoor amenity areas is proposed for the site.

The subject property is located at the southwest corner of Kerns Road and Four Seasons Drive and contains an existing commercial plaza with parking (Figure 1a). The western edge of the property contains a section of the Upper Hager Creek ravine. The ravine is part of a larger forested valley system located within the Tyandaga Neighbourhood that is designated as Regional Natural Heritage System on Map 1 in the 2018 Region of Halton Official Plan (ROP). Adjacent land uses include single-detached residential to the north, east, and west, and townhouse residential units to the south. The City of Burlington Official Plan designates the subject lands as Neighbourhood Commercial.

The top of bank and woodland dripline on the subject property were staked by Conservation Halton and Region of Halton staff, respectively, on November 29th, 2019. The staked top of bank and dripline was subsequently surveyed by J. D. Barnes Limited. The location of the staked top of bank and the woodland dripline are shown on Figure 1b. The proposed development is subject to Conservation Halton policy and permitting requirements under *O. Reg. 162/06 – Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses Regulation*.

1.1 EIA Scope of Work

Development applications located on lands "adjacent" to a natural heritage feature, such as a woodland or valleyland, are subject to the preparation of an EIA, in accordance with the policies and guidelines of the Region of Halton, the City of Burlington and Conservation Halton. Given that the proposed development is a re-development of an existing commercial plaza, and that no intrusion is proposed within the wooded, ravine slope portion of the lot, it was agreed at the November 29, 2019 site meeting that a "scoped" level of effort for the EIA would be reasonable.

The following EIA has been prepared based upon the agreed upon Terms of Reference (ToR) (Appendix A) and in accordance with the Region's 2014 EIA Guidelines[1]. Relevant policies and EIA triggers in the Halton Region OP, 2009 (June 19, 2019 Office Consolidation) have also been addressed, as outlined below.

1.2 Environmental Policy Context

An assessment of the quality and extent of natural heritage and natural hazard features and functions found within the study area was undertaken to comply with the requirements of the following legislation, plans and policies:

- Federal *Fisheries Act* (2019).
- *Migratory Birds Convention Act* (1994).

[1] The Region of Halton 2014 EIA Guidelines were in force at the time of the Nov. 29th, 2019 agency site meeting and the preparation of the approved EIA ToR in March 2020.

- Provincial *Endangered Species Act, 2007* (ESA 2019).
- *Planning Act* and Provincial Policy Statement (PPS; MMAH 2020).
- Growth Plan for the Greater Golden Horseshoe (MMAH, 2019).
- Region of Halton Official Plan (June 19, 2018 Office Consolidation).
- City of Burlington Official Plan (2020).
- Conservation Halton (*Conservation Authorities Act* and Ontario Regulation 162/06).

Features identified as "Key Features", as illustrated on Map 1G of the Region of Halton Official Plan, on or adjacent to the subject property (i.e., within 120 m of the site) include the following:

- Candidate significant woodland – Upper Hager Creek ravine, which extends upstream and downstream of the subject property.
- Potential habitat of endangered or threatened species – associated with the Upper Hager Creek ravine.
- Potential significant wildlife habitat – associated with the Upper Hager Creek ravine.
- Potential significant valleyland – Upper Hager Creek ravine.
- Potential fish habitat – Upper Hager Creek.

1.2.1 Federal Fisheries Act (2019)

The Department of Fisheries and Oceans Canada (DFO) administers the federal *Fisheries Act* which defines fish habitat as "*spawning grounds and other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes*" [subsection (2)1]. The *Fisheries Act* prohibits the death of fish by means other than fishing [subsection 34.4 (1)] and the harmful alteration, disruption, or destruction of fish habitat [HADD; subsection 35. (1)]. A HADD is defined as "*any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes*" (DFO 2019a).

Some projects may be eligible for exemption from the DFO review process, as specified under Step 3 of the DFO Fish and Fish Habitat Protection Program review process (DFO 2019b; e.g., clear-span bridges and bridge maintenance projects where DFO mitigation measures are applied, artificial waterbodies with no hydrological connection to occupied fish habitat, and projects that follow the Standards and Codes of Practice defined by DFO). All other projects or activities that have the potential to impact fish or fish habitat should be submitted to DFO through the "Request for Review" process. DFO will review the proposed project to determine whether there is potential to (1) impact an aquatic species at risk, (2) cause the death of fish or (3) result in HADD of fish habitat. The death of fish by means other than fishing or a HADD of fish habitat can be authorized by DFO under paragraphs 34.4(2)(b) or 35(2)(b) of the *Fisheries Act*. Authorizations require the preparation and submission of an application package identifying the impacts on fish and fish habitat as well as the avoidance, mitigation and offsetting measures that will be implemented as well as any monitoring that is proposed.

1.2.2 Migratory Birds Convention Act (1994)

This federal legislation protects the nests and offspring of listed migratory bird species from killing, capturing, injuring, taking, or disturbing of migratory birds (including eggs) or the damaging, destroying, removing, or disturbing of nests. In its application, it requires best management practices to detect and avoid disturbance to active nests during development activities.

To comply with this legislation, tree removal for the proposed development should not occur between early-April and late-August.

1.2.3 Provincial Endangered Species Act (2019)

The provincial *Endangered Species Act* (ESA) was developed to:

- Identify species at risk, based upon best available science.
- Protect species at risk and their habitats and to promote the recovery of species at risk.
- Promote stewardship activities that would support those protection and recovery efforts.

The ESA protects all threatened, endangered, and extirpated species itemized on the Species at Risk in Ontario (SARO) list. These species are legally protected from harm or harassment and their associated habitats are legally protected from damage or destruction, as defined under the ESA.

Screening for species protected under this Act has been addressed as part of the EIA.

1.2.4 Planning Act and Provincial Policy Statement (PPS 2020)

The Provincial Policy Statement (PPS) (MMAH 2020) was effective May 1, 2020 and replaces the previous 2014 PPS. The 2020 PPS is created under the authority of the *Planning Act* and provides direction on matters of provincial interest related to land use planning and development and "…supports a comprehensive, integrated and long-term approach to planning…". The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together when reviewing development applications.

The fieldwork component of the EIA was designed to addresses those policies that are specific to Natural Heritage (PPS Section 2.1) with some reference to other policies with relevance to natural heritage and impact assessment considerations and areas of overlap (e.g., those related to Efficient and Resilient Development and Land Use Patterns, Section 1.1; Sewage, Water and Stormwater, Section 1.6.6; Water, Section 2.2; and Natural Hazards Section 3.1). The impact assessment and mitigation measures component of the EIA addresses the requirements of the PPS to ensure the test of no negative impacts on natural heritage features or their ecological functions is demonstrated. In addition, natural hazard and stormwater management impact assessment and management recommendations have been developed to be consistent with the PPS.

Natural Heritage - PPS

Eight types of significant natural heritage features are defined in the PPS, as follows:

- Significant wetland.
- Significant coastal wetland.
- Significant woodland.
- Significant valleyland.
- Significant wildlife habitat.
- Fish habitat.
- Habitat of endangered and threatened species.
- Significant areas of natural and scientific interest (ANSIs).

Development and site alteration shall not be permitted in significant wetlands, or in significant coastal wetlands. Development and site alteration shall not be permitted in significant woodlands, significant valleylands, significant wildlife habitat or significant ANSIs, unless it is demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Development and site alteration shall not be permitted in the habitat of endangered and threatened species or in fish habitat, except in accordance with provincial and federal requirements.

Development and site alteration may be permitted on lands adjacent to the above features provided it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

The Scoped EIA ToR were developed to enable the study team to identify the presence of significant natural heritage features and functions within the study area in order to identify: (1) those areas where development is prohibited by PPS policy; (2) those areas where development may be permitted by PPS policy subject to demonstration of no negative impact; and (3) those areas that are not constrained by natural heritage features and functions. This included detailed fieldwork to identify vegetation communities, specific wildlife surveys, a site walk with CH and the Region of Halton staff to delineate the extent of physical top of bank and the woodland dripline, respectively.

Water - PPS

In terms of the PPS Water policies, Section 2.2.1 requires that planning authorities shall protect, improve, or restore the quality and quantity of water by:

a) using the watershed as the ecologically meaningful scale for integrated and long-term planning, which can be a foundation for considering cumulative impacts of development.

b) minimizing potential negative impacts, including cross-jurisdictional and cross-watershed impacts.

c) evaluating and preparing for the impacts of a changing climate to water resource systems at the watershed level.

d) identifying water resource systems consisting of ground water features, hydrologic functions, natural heritage features and areas, and surface water features including shoreline areas, which are necessary for the ecological and hydrological integrity of the watershed.

e) maintaining linkages and related functions among ground water features, hydrologic functions, natural heritage features and areas, and surface water features including shoreline areas, which are necessary for the ecological and hydrological integrity of the watershed.

f) implementing necessary restrictions on development and site alteration to:

    1. Protect all municipal drinking water supplies and designated vulnerable areas.

    2. Protect, improve, or restore vulnerable surface and ground water, sensitive surface water features and sensitive ground water features, and their hydrologic functions.

g) planning for efficient and sustainable use of water resources, through practices of water conservation and sustaining water quality.

h) ensuring consideration of environmental lake capacity, where applicable.

i) ensuring stormwater management practices minimize stormwater volumes and contaminant loads and maintain or increase the extent of vegetative and pervious surfaces.

The Scoped EIA ToR were developed to enable the study team to identify the features and functions as listed in Section 2.1.1 of the PPS in order to identify those areas where restrictions on development and site alteration are necessary in order to protect, improve or restore the water resource system.

Natural Hazards - PPS

Section 3.1.1 of the PPS directs development to areas outside of hazardous lands adjacent to the shoreline of the Great Lakes – St. Lawrence River System (flooding, erosion, and dynamic beach hazards), hazardous lands adjacent to river, stream, and small inland lake systems (flooding and/or erosion hazards) and hazardous sites. Section 3.1.2 further prohibits development and site alteration within:

a) the dynamic beach hazard.

b) defined portions of the flooding hazard along connecting channels (the St. Marys, St. Clair, Detroit, Niagara, and St. Lawrence Rivers).

c) areas that would be rendered inaccessible to people and vehicles during times of flooding hazards, erosion hazards and/or dynamic beach hazards, unless it has been demonstrated that the site has safe access appropriate for the nature of the development and the natural hazard.

d) a floodway regardless of whether the area of inundation contains high points of land not subject to flooding.

The study area is not adjacent to a lake or connecting channels and, as such, subsections (a) and (b) of Section 3.1.2 are not applicable. Subsections (c) and (d) are addressed in the Scoped EIA ToR through the

provision of delineating the stable top of bank through a geotechnical study. This will allow the study team to define the natural hazard limits within the Study Area.

1.2.5 Growth Plan for the Greater Golden Horseshoe

The Study Area is within the Greater Golden Horseshoe Growth Plan Area however, since the study area is within a settlement area, it is not included in the Growth Plan NHS.

The following policies are applicable to any development within the Growth Plan Area, as it relates to natural heritage features:

4.2.1 Water Resource Systems – Growth Plan

1. *Upper- and single-tier municipalities, partnering with lower-tier municipalities and conservation authorities as appropriate, will ensure that watershed planning is undertaken to support a comprehensive, integrated, and long-term approach to the protection, enhancement, or restoration of the quality and quantity of water within a watershed.*
2. *Water resource systems will be identified to provide for the long-term protection of key hydrologic features, key hydrologic areas, and their functions.*
3. *Watershed planning or equivalent will inform:*
    a. *the identification of water resource systems.*
    b. *the protection, enhancement, or restoration of the quality and quantity of water.*
    c. *decisions on allocation of growth; and*
    d. *planning for water, wastewater, and stormwater infrastructure.*

4.2.2 Natural Heritage System – Growth Plan

6. *Beyond the Natural Heritage System for the Growth Plan, including within settlement areas, the municipality:*
    a. *will continue to protect any other natural heritage features and areas in a manner that is consistent with the PPS; and*
    b. *may continue to protect any other natural heritage system or identify new systems in a manner that is consistent with the PPS.*

As noted above, no portion of the study area is within the Growth Plan NHS. As such, as per Section 4.2.2.6, the PPS policies as well as local policies will apply to protect natural heritage features and areas.

1.2.6 Region of Halton Official Plan (2018)

The Region of Halton Official Plan (ROP) is consistent with the PPS policies related to natural heritage, natural hazards, and water. The ROP has identified a RNHS consisting of Key Features, linkages,

enhancement areas and buffers. Policies 115.2 through 115.4 outline those features and functions that are included in the RNHS as follows:

115.2 The Regional Natural Heritage System consists of:

1. *areas so designated on Map 1,*
2. *the shoreline along Lake Ontario and Burlington Bay, and*
3. *significant habitats of endangered species and threatened species not included in the designation on Map 1.*

115.3 The Regional Natural Heritage System is a systems approach to protecting and enhancing natural features and functions and is scientifically structured on the basis of the following components:

Key Features, which include:

a) significant habitat of endangered and threatened species,
b) significant wetlands,
c) significant coastal wetlands,
d) significant woodlands,
e) significant valleylands,
f) significant wildlife habitat,
g) significant areas of natural and scientific interest,
h) fish habitat,

Key Features that have been identified are shown on Map 1G.

2. *enhancements to the Key Features including Centres for Biodiversity,*
3. *linkages,*
4. *buffers,*
5. *watercourses that are within a Conservation Authority Regulation Limit or that provide a linkage to a wetland or a significant woodland, and*
6. *wetlands other than those considered significant under Section 115.3(1)b).*

115.4 Included within the Regional Natural Heritage System are:

1. *Escarpment Natural Area and Escarpment Protection Area as identified in the Niagara Escarpment Plan, and*
2. *Regulated Flood Plains as determined, mapped and refined from time to time by the appropriate Conservation Authority.*
3. *Parts of the Agricultural System, being those areas of the Regional Natural Heritage System outside the Key Features or where the only Key Feature is a significant earth science area of natural*

and scientific interest, where agricultural operations are promoted and supported as compatible and complementary uses in the protection of the Regional Natural Heritage System in accordance with policies of the Agricultural System.

The Scoped EIA ToR were developed to enable the Study Team to identify the features and functions listed in ROP Policies 115.2 through 115.4.

ROP Policy 116.1 permits refinements to the RNHS as follows:

116.1 The boundaries of the Regional Natural Heritage System may be refined, with additions, deletions and/or boundary adjustments, through:

a) a Sub-watershed Study accepted by the Region and undertaken in the context of an Area-Specific Plan.

b) an individual Environmental Impact Assessment accepted by the Region, as required by this Plan; or

c) similar studies based on terms of reference accepted by the Region.

Once approved through an approval process under the Planning Act, these refinements are in effect on the date of such approval. The Region will maintain mapping showing such refinements and incorporate them as part of the Region's statutory review of its Official Plan.

The information gathered through the Scoped EIA will be used to refine the RNHS, as appropriate, based on the conclusions of the study.

1.2.7 City of Burlington Official Plan (2020)

Burlington's new Official plan was adopted by City Council on April 26, 2018 and approved, with modifications, by Halton Region on November 30, 2020. The City of Burlington Official Plan (City OP) is consistent with the ROP and, as a result, is consistent with PPS policies related to natural heritage, natural hazards, and water. The City OP has identified an NHS that is consistent with the RNHS. Policies 4.2.2, 4.2.4 and 4.4 establish the City's policy direction related to natural heritage and water resources, natural hazards, and stormwater management. A summary of those policies is provided below:

4.2.2(d) The City's Natural Heritage System is made up of:

i. Areas so designated on Schedule C: Land Use – Urban Area, and Schedule I: Land Use – Rural Area, of this Plan;

ii. The shoreline along Lake Ontario and Burlington Bay/Hamilton Harbour; and

iii. Areas identified as Natural Heritage System on Schedule M: The Natural Heritage System within the North Aldershot Planning Area; and

iv. Natural Heritage Features and Areas not designated as Natural Heritage System on Schedule C: Land Use - Urban Area or Schedule I: Land Use – Rural Area, or not shown as Natural Heritage Features and Areas on Schedule M: The Natural Heritage System, of this Plan.

Natural Heritage Features and Areas, mentioned in Policy 4.2.2.(d)(iv) above are defined in the City OP as:

Features and areas, including significant wetlands, significant coastal wetlands, other coastal wetlands, fish habitat, significant woodlands, significant valleylands, habitat of endangered species and threatened species, significant wildlife habitat, and significant areas of natural and scientific interest, which are important for their environmental and social values as a legacy of the natural landscapes of an area.

4.2.2(e) The City's Natural Heritage System embodies a systems approach to protecting and enhancing natural heritage features and areas and ecological and hydrologic functions and is scientifically structured on the basis of the following components:

(i) Key Natural Features, which include:

a. Habitat of endangered species and threatened species.

b. Significant wetlands.

c. Significant coastal wetlands.

d. Significant woodlands.

e. Significant valleylands.

f. Significant wildlife habitat.

g. Significant areas of natural and scientific interest; and

h. Fish habitat.

Key Natural Features that have been identified are shown on Schedule M: The Natural Heritage System, of this Plan. Additional Key Natural Features may be identified through future studies, through the development application or site alteration application process, or through an Environmental Assessment. Schedule M may not identify refinements to the Natural Heritage System that have been approved pursuant to Subsection 4.2.2h) of this Plan or additions to the Natural Heritage System that have been identified in accordance with Subsection 4.2.2k) of this Plan.

(ii) enhancements to the Key Natural Features including Centres for Biodiversity.

(iii) linkages.

(iv) buffers.

(v) watercourses that are within a Conservation Halton Regulation Limit or that provide a linkage to a wetland or a significant woodland; and

(vi) wetlands other than those considered significant under Subsection 4.2.2e)(i) of this Plan.

(f) The City's Natural Heritage System includes lands that are:

(ii) regulated as hazardous lands and hazardous sites as determined, mapped and refined from time to time by Conservation Halton. Policies respecting hazardous lands and hazardous sites are contained in Subsection 4.4.2(3) of this Plan.

Similar to the ROP, the City OP allows for refinement of the City's NHS boundaries through Policy 4.2.2(h):

4.4.2(h) The boundaries of the City's Natural Heritage System, and of Key Natural Features within it, may be refined, with additions, deletions and/or boundary adjustments, through:

- *(i) A subwatershed study undertaken in the context of an area-specific plan and prepared in accordance with Subsection 4.4.2(1) of this Plan.*
- *(ii) An individual Environmental Impact Assessment (EIA) prepared in accordance with Subsection 4.2.4 of this Plan; or*
- *(iii) A similar study based on terms of reference accepted by the City, the Region of Halton and, where appropriate, Conservation Halton.*

Provided that the study or EIA has been accepted by the City, the Region of Halton and, where appropriate, Conservation Halton.

City OP policy 4.2.2(m) prohibits development and site alteration within significant wetlands, significant coastal wetlands, fish habitat (except in accordance with Provincial and Federal legislation or regulations), the habitat of endangered species and threatened species (except in accordance with Provincial and Federal legislation or regulations) and, hazardous lands, hazardous sites and other areas regulated by CH unless the development application is in accordance with Subsection 4.4.2(3) of the City OP and permission has been received by CH. The policy further prohibits development or site alteration within or adjacent to the City's NHS unless it has been demonstrated through an EIA that there will be no negative impacts on the City's NHS or on natural heritage features and areas or their ecological and hydrological functions or linkages.

Section 4.2.4 outlines the City's expectations with respect to Environmental Impact Assessments.

Section 4.4.2(2) provides policies related to Water Resource and Stormwater Management. All policies are applicable however, key policies are outlined below:

4.4.2(2)(a) Planning for stormwater management shall:

- *(i) be integrated with planning for sewage and water services and ensure that systems are optimized, feasible and financially viable over the long term.*
- *(ii) minimize, or where possible, prevent increases in contaminant loads, and enhance water quality.*
- *(iii) minimize erosion and changes in water balance, where possible, enhance water quality and prepare for the impacts of a changing climate through the effective management of stormwater, including the use of green infrastructure.*
- *(iv) mitigate risks to human health, safety, property and the natural environment.*
- *(v) maximize the extent and function of vegetative and pervious surfaces; and*
- *(vi) promote stormwater management best practices, including stormwater attenuation and re-use, water conservation and efficiency, and low impact development.*

(b) Stormwater management techniques shall be used in the design and construction of all new developments to control both the quantity and quality of stormwater runoff. The degree of control and techniques use will depend on the conditions in the downstream receiving water bodies. The negative impacts of development on the downstream aquatic environment and adjacent lands shall be avoided or mitigated.

(c) The provision of stormwater drainage facilities shall be in accordance with master plans established through watershed and subwatershed studies, the criteria established int eh City's Storm Drainage Criteria Manual, the Region of Halton's Guidelines, and Conservation Halton requirements.

(f) Functional drainage designs will consider maintenance of natural watercourses, fish habitat and other key natural features, control of discharges to surface and groundwater, water quality and quantity targets and the identification and protection of sensitive groundwater and surface water features.

(i) The City will encourage stormwater management best practices and low impact development measures where appropriate, in consultation with Conservation Halton. The City may require a geotechnical study to support the low impact development measures.

Finally, Section 4.4.2(3) provides the City's policy direction related to natural hazards and watercourses. Key policies are provided below:

4.4.2(3)(a) The policies of this section shall be read in conjunction with the objectives and policies of Section 4.2, Natural Heritage System, of this Plan. Hazardous lands and hazardous sites are often located within the components of the Natural Heritage System identified in Subsection 4.2.2e) of this Plan. As such, hazardous lands, hazardous sites and associated setbacks shall be designated Natural Heritage System if they are located within other Natural Heritage System components. In instances where hazardous lands and/or hazardous sites are not located within other Natural Heritage System components, another land use designation may be appropriate, provided the hazardous lands and/or hazardous sites are addressed appropriately in accordance with the policies of this section.

b) The Zoning By-law shall prohibit new construction and the expansion or replacement of existing non-conforming uses within hazardous lands and hazardous sites, except where specifically permitted by Conservation Halton.

d) The delineation and regulation of hazardous lands and hazardous sites is administered by the Conservation Authority. Conservation Halton regulates lands in or adjacent to river or stream valleys (including flooding and erosion hazards), wetlands, shorelines and other hazardous lands. The approximate regulated limit of these lands and the location of watercourses are illustrated in Appendix E: Conservation Halton Approximate Regulation Limit Mapping, of this Plan. The limits of hazardous lands in Appendix E of this Plan may be updated from time to time. The map lines are approximate and there may be some regulated areas which have not been mapped. Technical studies may be required to identify regulated hazardous lands, hazardous sites, watercourses and

wetlands that are unmapped. Conservation Halton must be contacted to confirm the approximate regulation limit mapping and permit requirements.

f) New development adjacent to watercourses shall be subject to a setback from the stable top of bank, the flooding hazard and meander belt allowance (whichever is greater) that are associated with the watercourse. The location of the stable top of bank, flooding hazard and meander belt allowance width shall be determined by Conservation Halton, in conjunction with the City.

g) As a condition of development approval, the City shall require the dedication of hazardous lands from the greater of the flooding hazard, or the valley through which the watercourse flows, including a conservation setback from the stable top of bank, flooding hazard, or meander belt allowance. Dedication of these lands shall not be considered part of parkland dedication requirements of The Planning Act. If it can be demonstrated, to the satisfaction of the City, that the policies of this Plan can be achieved by other means, the dedication of hazardous lands may not be required. If any such land remains in private ownership, it shall be protected by zoning, agreement and/or easement to address natural hazards and protect ecological functions.

h) Development adjacent to valleyland and watercourse features may be required to be supported by detailed slope stability, stream erosion and/or flooding studies, where appropriate. The studies and resulting limits of hazardous lands shall be to the satisfaction of the City and Conservation Halton.

i) As part of the development approval process, the zoning of hazardous lands, hazardous sites and associated setbacks to an appropriate open space zoning category shall be required if the hazardous lands and/or hazardous sites are located within other Natural Heritage System components, as identified in Section 4.2, Natural Heritage System, of this Plan.

j) Watercourses and valleylands should be left in their natural state.

n) The City will encourage the planting and reforestation of creek blocks, streams and valleylands, and their buffer areas where appropriate using native and non-invasive species, so as to reduce flooding and erosion, maintain stream banks and slope stability and provide suitable fish habitat.

Although the EIA ToR were developed under the City's previous OP, the content of the EIA ToR is consistent with the expectations as outlined in Policy 4.2.4 of the City's current OP.

1.2.8 Conservation Halton

Conservation Halton (CH) provides plan review and input to their municipal partners through the review of *Planning Act* applications. Through this process, CH provides peer review advice to the Region of Halton to assist them in fulfilling their responsibilities related to natural hazards, natural heritage, and other relevant policy areas pursuant to the *Planning Act*. The parameters of this peer review are outlined in a Memorandum of Understanding (MOU) between the Region, local municipalities, and Conservation Authorities.

From a regulatory perspective, CH administers the *Development, Interference with Wetlands, Alterations to Shorelines and Watercourses* regulation (Ontario Regulation 162/06). Permission is required from CH for any development or site alteration within the areas covered by this regulation including flooding and erosion hazards, watercourses, wetlands, and associated allowances adjacent to these areas.

The Study Area contains the Upper Hager Creek and its associated valley feature, which is regulated pursuant to Ontario Regulation 162/06.

The Scoped EIA ToR were developed and approved in consultation with CH and included a top of bank staking and geotechnical report intended to delineate and further refine those areas regulated by CH (i.e., stable top of bank). In addition, the EIA ToR also contain requirements for ecological fieldwork to determine the presence/absence of significant natural heritage features and functions in-keeping with CH's MOU with the Region.

1.3 Study Purpose

The purpose of this EIA is to provide the following information:

- A description of the ecological features and functions of the subject property and adjacent lands based on existing background information, field reconnaissance and in-season field surveys.
- An environmental framework delineating where development can and cannot occur.
- A description of the proposed development.
- An evaluation of potential impacts to natural heritage system features and functions.
- Recommended mitigation measures to avoid or minimize negative environmental impacts.
- A restoration plan for the Upper Hager Creek ravine buffer and slopes.
- An opinion on whether the development application conforms to the hierarchy of natural heritage policies that apply to the site (i.e., Growth Plan, Provincial Policy Statement, Region of Halton Official Plan, City of Burlington Official Plan, Conservation Halton policies/regulations, Endangered Species Act, Fisheries Act).

2.0 STUDY METHODOLOGY

2.1 Background Documents and Mapping

The following background documents and mapping were reviewed as part of the EIA:

- Land Information Ontario (LIO).
- Make a Natural Area Map (Province of Ontario).
- DFO Aquatic Species at Risk Mapping.
- Upper Hager Creek, Escarpment to Four Seasons Drive Class Environmental Assessment, City of Burlington (AMEC Foster Wheeler 2015).
- Slope Stability Analysis (EXP Services Inc. 2022).
- Functional Servicing and Stormwater Management Report (KWA 2022).
- Hydrogeological and Water Balance Investigation (EXP Services Inc. 2022).
- Landscape Plan (Adesso Design Inc. 2021).

- Tree Inventory and Preservation Plan (Jackson Arboriculture Inc. 2022).

2.2 Field Inventories

Given the above site description and development context, the field work program for the EIA was "scoped" in nature and included the following surveys:

- Woodland dripline and top of bank staking with Region of Halton and Conservation Halton staff (November 29th, 2019).
- Vegetation survey of plants within the ravine and top of bank portion of the subject property (spring, summer, fall - 2020). The vegetation communities on and abutting the subject property were described and mapped following the *Ecological Land Classification System for Southern Ontario* (Lee et al. 1998).
- Breeding bird survey following Ontario Breeding Bird Atlas protocol (2 surveys between mid-May and mid-July - 2020).
- Bat habitat assessment – a high-level assessment of the suitability of the adjacent ravine to support summer maternity and roosting habitat for bats.
- Fish habitat assessment – an assessment of fish habitat within Upper Hager Creek was completed based on reconnaissance level investigations and existing background information.
- Incidental wildlife observations were recorded during all field survey work.

2.3 Species-at-Risk

Natural Heritage Information Centre (NHIC) data was accessed through the *Make a Natural Heritage Area Map* tool on the Government of Ontario website[2].

Determining the presence/absence of species at risk within the study area was completed as part of the 2020 in-season field work program, as described above. The DFO aquatic species at risk mapping was also reviewed to determine if the Upper Hager Creek supports critical or potential habitat for endangered/threatened species.

2.4 Analysis of Significant Natural Heritage Features

An analysis of significant natural heritage features on or adjacent to the subject property was completed following the criteria outlined in the Natural Heritage Reference Manual to the Provincial Policy Statement (MNR 2010) and the Region of Halton Official Plan (2018). Natural heritage features considered in the analysis included the following:

- Woodland.
- Wildlife habitat.
- Valleyland.
- Fish habitat.
- Habitat of Endangered and Threatened Species

[2] MECP staff direct you to this website for records on species at risk (M. Karam – pers. comm.).

2.5 Habitat of Endangered and Threatened Species

The Region of Halton specifically requested that Endangered bat species and butternut be addressed as part of the EIA.

The presence/absence of butternut trees within the study area was determined through the tree inventory and plant surveys. A high-level assessment of bat habitat was completed as part of the plant surveys.

The presence/absence of species at risk in general, including species listed in the NHIC/DFO data base for the study area (i.e., 1x1 km square), was completed during the 2020 field work program.

2.6 Tree Inventory – Jackson Arboriculture Inc.

An inventory of trees within and adjacent to the proposed development envelope was completed as part of the EIA. The tree inventory followed the City of Burlington guidelines and included measures to protect trees that are proposed to be retained. An assessment of potential hazard trees within the woodland edge that flanks the proposed development was also completed. Tree hazard abatement measures were provided, where necessary. The initial field assessment of trees was conducted on May 21, 2020. A follow-up assessment was completed on January 27th, 2022, to address City of Burlington review comments.

The following information was collected for each individual tree included in the inventory:

- Tree #: numbers assigned to trees that correspond to the tree locations on Figure 1 (Appendix G) and the tree inventory.
- Species: common and scientific names provided in the inventory table (Table 1 – Appendix G).
- DBH: diameter at breast height (cm), measured at 1.4 m above the ground.
- Condition: the health of the tree considering the structure and health rated as a percentage.
- Impacts: the percent impact to the mTPZ.
- mTPZ: Minimum Tree Preservation Zone, i.e., the distance in meters from the base of the tree trunk at which tree protection fence is to be installed.
- Location: the property where the tree is situated, based on the topographic survey.
- Comments: any additional notes relevant to the tree's health or growing conditions.
- Action: the recommended removal or preservation of each tree based on the impact assessment.

All trees 10 cm in diameter and larger situated on the subject property, trees situated on neighbouring property within 3 m of the property limits, and all trees situated within Municipal Road allowances were included in the inventory. The trees included in the inventory were identified with numbers 1 to 42 and were located by a topographic survey provided by J. D. Barnes Limited.

The presence/absence of butternut, an endangered tree species, was also completed as part of the tree inventory and plant surveys.

2.7 Project Team

The following is a list of contributors to the EIA:

• Jennifer Lawrence	Natural Heritage Planner	Jennifer Lawrence & Associates Inc.
• Anthony Goodban	Botanist	Goodban Ecological Consulting Inc.
• Tyler Hoar	Wildlife Biologist	PLAN B Natural Heritage
• Jeremy Jackson	Arborist/GIS	Jackson Arboriculture Inc.
• Brad Bricker	Ecologist	PLAN B Natural Heritage

Curriculum vitae of the above EIA contributors are provided in Appendix B.

3.0 RESULTS

3.1 Topography, Soils & Hydrogeology

The subject property is relatively flat and slopes gradually to the south and southwest. Upper Hager Creek flanks the site on the west, which is part of Conservation Halton's North Shore Watershed. The creek is associated with a deeply incised ravine that ranges in height from 9 m to 10.9 m (EXP Services Inc. 2022). According to EXP Services Inc. (2022), the slope adjacent to the site does not show any visible signs of instability.

Soils in the vicinity of the subject property are mapped as Oneida clay loam (Gillespie et al. 1971). The subsurface conditions reported by EXP Services Inc. (2022) are comprised of pavement/asphalt over fill, clayey silt, and clayey silt till that is underlain by shale bedrock.

Groundwater elevations within Borehole 6, located adjacent to the Upper Hager Creek ravine, ranged from 3.8 m to 7.9 m below ground surface (EXP Services Inc. 2022). The groundwater flow path has been interpreted by EXP Services Inc. (2022) to be in a southwest direction, towards Upper Hager Creek.

Based on a slope stability analysis, EXP Services Inc. (2022) have confirmed that the Upper Hager Creek ravine slope is stable, and that the 7.5 m stable top of bank setback can be measured from the physical (staked) top of bank except for a short section in the middle of the property where a slope toe erosion allowance of 2m was applied.

3.2 Vegetation & Flora

3.2.1 Study Approach

Surveys of vegetation and flora were completed on May 21, June 28, and October 1, 2020. The focus of the survey was the small Upper Hager Creek ravine adjacent to the proposed development area. Vegetation communities (ELC Units) were classified and mapped following the *Ecological Land Classification for Southern Ontario: A First Approximation* (Lee et al. 1998). Some ELC polygons less than 0.5 ha in size were mapped to provide a more detailed view of the vegetation features onsite. Vascular plant species status was checked for Ontario (Oldham and Brinker 2009) and Halton Region (Crins et al. 2006). Detailed soils data were not collected because the ravine bottomlands and more intact slopes are located on adjacent properties (e.g., 1856 Four Seasons Drive; 1851, 1847, 1843 and 1839 Heather Hills Drive; and, behind Tyandaga Mews townhouse complex) and the onsite ravine slope soils are mostly fill and non-native material. Observations of the adjacent properties were made from the subject property and the Four Seasons Drive right-of-way.

In the text below, non-native/introduced vascular plant taxa are denoted with a plus sign in parentheses (+).

3.2.2 General Overview

The tableland portion of the subject property is developed. The site includes a strip mall building and parking lot. The building has multiple commercial tenants, including a convenience store and the Burlington Children's Centre (daycare). The westernmost portion of the property is within the Upper Hager Creek ravine. Four Season's Drive crosses the ravine; the crossing is on fill with a culvert, i.e., it is not an open span crossing. The slopes on and adjacent to the property are quite disturbed as a result of past road construction (Four Season's Drive) and the earlier development of the site for commercial purposes. South of the subject property is the Tyandaga Mews townhouse complex. North of the site across Four Seasons Drive, there are residential lots fronting onto Kerns Road. Southwest of the site (fronting onto Heather Hills Drive) there are deep residential lots that extend down the ravine slope and across the bottomland, however the slope and bottomland portions of the lots are still in a relatively natural condition.

Soils in the vicinity are mapped as Oneida clay loam (Gillespie et al. 1971). This is a fine textured, well drained soil with clay loam till parent material. The ravine slopes are variably steep; adjacent to the parking lot and daycare centre the slopes are quite steep. Upper Hager Creek was in a low flow condition during each of the site visits, but it clearly conveys much greater flows after storm events, given the scouring and undercutting of the banks that has occurred.

The main vegetation community types present are slope forests (FOD, FOD4-2, FOD5-11*) and bottomland forest (FOD6-1). The slopes forests mainly contain Sugar Maple (*Acer saccharum* ssp. *saccharum*), White Ash (*Fraxinus americana*), Basswood (*Tilia americana*), Ironwood (*Ostrya virginiana*), Black Cherry (*Prunus serotina*) and Red Oak (*Quercus rubra*). The bottomland forests mainly contain Sugar Maple, Green Ash (*Fraxinus pennsylvanica*), White Elm (*Ulmus americana*) and Basswood. The disturbed areas at Four Season's Drive and adjacent to the onsite parking lot are mapped as "Ornamental/Disturbed"; trees present include Austrian Pine (*Pinus nigra* +), Honey Locust cultivar (*Gleditsia triacanthos* var. *'inermis'* +), Fir (*Abies* sp. +) and Weeping Willow (*Salix* X *sepulcralis* +)

3.2.3 Vegetation Communities (ELC Units)

Vegetation communities are mapped on Figure 2 and brief community descriptions are provided below. More detail is provided for those vegetation communities immediately adjacent to the proposed re-development area. Representative site photographs are provided in Appendix C and photo references are provided in the community descriptions below. ELC data cards are provided in Appendix D.

Terrestrial

FOD Deciduous Forest

This unit is not on the subject property; it is on the west slope of the ravine in behind the residences at 1856 and 1860 Four Season's Drive. The main trees in this slope forest appear to be Sugar Maple, White

Ash, Basswood, Ironwood, Black Cherry and Red Oak. Trees appear to be mainly in the 10-24 cm and 25-50 cm diameter at breast height (dbh) size ranges.

FOD4-2 Dry-Fresh White Ash Deciduous Forest Type

Unit FOD4-2 is a small unit on the ravine slope adjacent to the onsite parking lot. The main trees are White Ash, Sugar Maple, Manitoba Maple (*Acer negundo*) and a few Black Walnut (*Juglans nigra*). Trees are in the <10 cm and 10-24 cm dbh size ranges. Some of the ash are declining due to an Emerald Ash Borer infestation of the ravine. Soils are disturbed and appear to be fill. Groundcovers are sparse and weedy, including Garlic Mustard (*Alliaria petiolata* +) and Dame's-rocket (*Hesperis matronalis* +). Scattered native groundcovers include Woodland Sedge (*Carex blanda*) and Blue-stemmed Goldenrod (*Solidago caesia*). At the base of the slope there is 30+ cm dbh Black Walnut that is getting undercut by Upper Hager Creek during periods of higher flows. See Photos 1 to 3.

FOD5-11 Dry-Fresh Sugar Maple – Hardwood Deciduous Forest Type*

This is a slope forest unit that is behind the Tyandaga Mews townhouse complex, extending to the rear of the daycare centre on the subject property. Sugar Maple (*Acer saccharum* ssp. *saccharum*) is the dominant species, with White Ash, Basswood, Ironwood, Black Cherry, Red Oak and Shagbark Hickory (*Carya ovata*) as associates. Trees are mainly in the 25-50 cm dbh size range. See Photos 4, 6 and 7.

Groundcovers include native species such as Pennsylvania Sedge (*Carex pensylvanica*), Rosy Sedge (*Carex rosea*), Wild Geranium (*Geranium maculatum*) and weedy, invasive species such as Garlic Mustard (+), Dame's-rocket (+) and Urban Avens (+).

FOD6-1 Fresh-Moist Sugar Maple – Lowland Ash Deciduous Forest Type

This bottomland unit is located mainly offsite. The main trees are Sugar Maple, Green Ash, White Elm and Basswood. Trees are mainly in the 10-24 cm and 25-50 cm dbh size ranges. There are some patches of maple-ash saplings where there are canopy gaps created by Green Ash seriously declining due to the Emerald Ash Borer infestation.

At the upper end of this unit, closer to Four Season's Drive, are several very large Weeping Willow (*Salix* X *sepulcralis* +) that were likely planted when the creek crossing and residential subdivision were originally constructed in the early 1970's. Some Norway Maple (*Acer platanoides* +) trees are becoming established in some areas, invading from the adjacent residential properties.

The groundcovers are variable but weedy in places. Native species include Woodland Sedge, Graceful Sedge (*Carex gracillima*) and Fowl Manna Grass (*Glyceria striata*). Some of the invasive groundcovers from the upstream area mapped as "Ornamental/Disturbed" have become established in this bottomland unit, including Creeping Bugleweed (*Ajuga reptans* +), Climbing Euonymus (*Euonymus fortunei* +) and Goutweed (*Aegopodium podagraria* +). Other invasive groundcovers include Garlic Mustard (+), Dame's-rocket (+) and Urban Avens (*Geum urbanum* +).

Along the creek there are a few patches of Fowl Manna Grass, Clearweed (*Pilea pumila*), Spotted Jewelweed (*Impatiens capensis*) and Virginia Cutgrass (*Leersia virginica*).

See Photos 4, 6 to 10.

ORN/DIST Ornamental/Disturbed

The area mapped as "Ornamental/Disturbed" is not a natural vegetation community. This unit encompasses the fill slopes at Four Season's Drive and west of the onsite parking lot, as well as the adjacent bottomland. Planted trees along top-of-bank include Austrian Pine (+), Honey Locust cultivar (+) and Fir (+). Several large Weeping Willow (*Salix* X *sepulcralis* +) occur in this unit, which were likely planted in conjunction with the construction of the road and subdivision in the early 1970's. The slopes appear to be fill.

On the slope next to the parking lot there are patches of the highly invasive European Swallow-wort or Dog-strangling Vine (*Cynanchum rossicum* +) growing in the open. On the more shaded slopes and on the bottomland, there are dense mats of Periwinkle (*Vinca minor* +), Creeping Bugleweed (+) and Climbing Euonymus (+). Other invasive groundcovers include Garlic Mustard (+), Dame's-rocket (+) and Urban Avens (+).

See Photos 10 to 16.

3.2.4 Flora and Floristics

A vascular plant checklist is provided in Appendix E. A total of 91 vascular plant taxa were identified during the 2020 field surveys. Thirty-one (31) taxa or 34.1% of the flora are considered non-native and introduced to southern Ontario, which is a relatively high proportion of non-native species.

3.3 Breeding Birds

Breeding bird surveys were completed on June 1st and June 15th, 2020. Five-minute point count surveys following the second Ontario Breeding Bird atlas methodology were conducted (Cadman et. al. 2007). One station was situated in the ravine directly adjacent to the parking lot. The other 2 stations were set up in the adjacent neighbourhood. The location of point count stations is shown on Figure 3.

The weather conditions during the surveys were as follows:

- June 1, 2020 - 12 to 14 degrees Celsius, wind 5-15 km/h, mostly cloudy skies.
- June 15, 2020 - 16 degrees Celsius, wind 15 km/h, mostly clear skies.

A total of 20 bird species were observed in the study area (Appendix F). The majority of birds observed were common species that regularly inhabit suburban areas with wooded ravines. The most common species recorded during the surveys were American Robin, House Sparrow, and European Starling.

Eastern Wood Pewee, a species-at-risk (i.e., Special Concern - SARO), was recorded during the June 1st, 2020 survey in the ravine adjacent to the parking lot. The individual was calling >100m down valley from the subject property. Eastern Wood Pewee was not recorded during the June 15th, 2020 survey.

3.3.1 Incidental Wildlife and Fish Observations

No incidental observations of wildlife species were recorded during the field survey program. No fish species were observed within the Upper Hager Creek adjacent to the subject property. Common urban wildlife species such as red squirrel, eastern grey squirrel, eastern chipmunk, eastern cottontail, raccoon, striped skunk, red fox, American toad, and meadow vole are likely present within the wooded ravine and the surrounding neighbourhood.

3.4 Tree Inventory

A total of 44 trees situated on the subject property, on neighbouring properties, and within the road allowance were included in the tree inventory. Trees included in the inventory were comprised of Austrian Pine (*Pinus nigra*), Eastern Red Cedar (*Juniperus virginiana*), Little-leaf Linden (*Tilia cordata*), Sugar Maple (*Acer saccharum*), Honey Locust cultivar (*Gleditsia triacanthos inermis*), Norway Maple (*Acer Platanoides*), Scots Pine (*Pinus sylvestris*), Sycamore (*Platanus occidentalis*), Norway Spruce (*Picea abies)*, Copper Beech (*Fagus sylvatica*), and Fir (*Abies sp.*). Butternut, an Endangered tree species, was not observed on or adjacent to the subject property. No tree removal is proposed within the wooded ravine on the west edge of the site. Tree removals along the south and east property line, and within the ravine setback area are required to accommodate site grading and/or address hazard issues.

Refer to Table 1 for the complete tree inventory and Figure 1 for the tree locations in Appendix G – *Tree Inventory and Preservation Plan Report* (Jackson Arboriculture Inc. 2022).

3.5 Analysis of Significant Natural Heritage Features

Based on our review of existing background documents, Land Information Ontario (LIO), and in-season field survey results, we can confirm that the study area does not contain the following natural heritage features and areas, as outlined in Section 2.1 of the PPS (2020):

- Significant wetlands.
- Significant coastal wetlands.
- Significant areas of natural and scientific interest (ANSI).
- Fish habitat (direct contribution).
- Habitat of endangered species and threatened species[3].

The study area does however contain the following natural heritage features:

- Significant woodland (potential).
- Significant wildlife habitat.
- Significant valleyland (potential).

[3] This observation only applies to the study area and the 120 m *adjacent lands* that support natural heritage features.

- Fish habitat (indirect contribution, future potential)

The basis for the natural heritage feature assessment is provided below. The analysis is based on the criteria listed in the *Natural Heritage Reference Manual* (2010) for determining whether a natural feature qualifies as significant woodland and/or significant wildlife habitat under the PPS (2020). The Region of Halton criteria was used for the significant woodland assessment.

3.5.1 Significant Woodland

The Region of Halton Official Plan (2018) defines a "significant woodland" as *Woodland 0.5 ha or larger determined through a Watershed Plan, a Sub-watershed Study or a site-specific Environmental Impact Assessment to meet one or more of the four following criteria*:

- the *Woodland* contains forest patches over 99 years old.
- the patch size of the *Woodland* is 2 ha or larger if it is located in the Urban Area, or 4 ha or larger if it is located outside the Urban Area but below the *Escarpment Brow*, or 10 ha or larger if it is located outside the Urban Area but above the *Escarpment Brow*.
- the *Woodland* has an interior core area of 4 ha or larger, measured 100m from the edge.
- the *Woodland* is wholly or partially within 50 m of a *major creek or certain headwater creek* or within 150m of the *Escarpment Brow*.

The subject woodland meets the Region of Halton Official Plan definition of "significant" woodland (i.e., two out of four criteria - greater than 2.0 ha in area (approx. 7 ha), proximity to Upper Hager Creek – within 20 to 30 m). The limit of the woodland on the subject property was staked on November 29th, 2019 by Region of Halton staff. It is our understanding that the Region of Halton staff reviewed the staked boundary and found it to be an acceptable interpretation. The combination of the stable top of bank (plus 7.5 m buffer) and the staked woodland boundary (plus 10 m buffer) were used as a "framework" for the proposed development application. The subject woodland (ravine) is identified as part of the Region of Halton Natural Heritage System (Source: Region of Halton Official Plan 2018).

The subject woodland likely meets the Provincial criteria for "significance"; however, this level of assessment was above and beyond the scope of this EIA. To complete this assessment would require a more fulsome analysis of the Upper Hager Creek system and an analysis of woodland area within the larger planning district. Notwithstanding this, the subject woodland does meet the Region of Halton's criteria for woodland significance, which is more rigorous than the criteria outlined in the Natural Heritage Reference Manual to the Provincial Policy Statement (2010).

3.5.2 Significant Wildlife Habitat

The Significant Wildlife Habitat (SWH) Criteria Schedules for Ecoregion 7E (2015) were reviewed to determine if additional field surveys above and beyond the scope of this EIA were required. Given that no development is proposed within the wooded ravine flanking the subject property, and that the development proposal is to convert an existing commercial plaza to a retirement home, no additional field investigations or analysis was deemed necessary. A desktop analysis combined with the results of the in-season field surveys were used to determine if the wooded ravine meets the definition of significant wildlife habitat, as per the Natural Heritage Reference Manual (MNR 2010).

Based on the observation of Eastern Wood Pewee (Special Concern), the ravine adjacent to the subject property would qualify as "significant wildlife habitat" (Source: Natural Heritage Reference Manual – MNR 2010). Natural heritage areas or features that provide habitat for species of conservation concern are considered "significant" wildlife habitat in accordance with provincial criteria. The forested ravine also provides seasonal stopover habitat for migrating birds in the spring/fall, as well as a species dispersal corridor in association with the Niagara Escarpment to the north[4].

Negative impacts to Eastern Wood Pewee or migratory birds are not anticipated as no loss of habitat is proposed within the wooded ravine. The ravine will be protected by a 7.5 m stable top of bank setback or a 10 m dripline setback for the majority of the site. The proposed land use, a retirement home, is similar in character to the surrounding residential neighbourhood where the species was recorded.

3.5.3 Significant Valleyland

The assessment of significant valleyland was above and beyond the scope of the EIA ToR. This analysis requires input from a Professional Geologist to assess and map the limits of the feature. Furthermore, the analysis would involve the entire Upper Hager Creek system beyond the 120 m adjacent lands. Notwithstanding this, the ravine flanking the development site will be protected by the greater of a 7.5 m buffer measured from the long-term stable top of slope or a 10 m buffer from the woodland dripline for the majority of the site.

3.5.4 Species at Risk

Species at risk previously recorded from the 1x1 km square that the study area is located within (i.e., 17NH9499) included the following:

- Spotted Wintergreen (*Chimaphila maculata*) – Endangered (SARO).
- Timber Rattlesnake (*Crotalus horridus*) – Extirpated (SARO).

Determining the presence/absence of species at risk within the study area was completed as part of the 2020 in-season field work program, as described above. The DFO aquatic species at risk mapping was also reviewed to determine if the Upper Hager Creek supports critical or potential habitat for endangered/threatened species. Based on the results of our surveys, Spotted Wintergreen (a plant species) and Timber Rattlesnake were not observed within the study area. As noted above, Eastern Wood Pewee, a bird species of Special Concern, was recorded from the wooded ravine, downstream of the subject property. Upper Hager Creek does not support critical or potential habitat for aquatic species at risk (Source: DFO 2021).

The wooded ravine adjacent to the subject property has the potential to support summer maternity and/or roosting habitat for endangered bat species (i.e., mature weeping willow and decadent ash trees). Irrespective of this, no development intrusion or tree removal is proposed within this feature. It should be noted that the woodland/ravine on the subject property is part of a larger feature and, due to multiple ownership of the valley upstream and downstream, it would not be possible to conduct a fulsome tree cavity and snag survey to confirm whether the woodland qualifies as candidate significant wildlife habitat

[4] Woodlands greater than 10 ha in area and within 5 km of the Lake Ontario shoreline represent "candidate" significant wildlife habitat for migratory birds. The Upper Hager Creek ravine is greater than 10 ha in area and is less than 5 km from the Lake Ontario shoreline.

for bats. Since no habitat loss is proposed within the ravine, negative impacts to bats or bat habitat are not anticipated.

Negative impacts to Eastern Wood Pewee (Special Concern) are also not anticipated as no loss of habitat is proposed within the wooded ravine. The ravine will be protected by a 7.5 m top of bank setback or 10 m dripline setback for the majority of the site.

As noted above, the proposed land use, a retirement home, is similar in character to the surrounding residential neighbourhood that provides habitat for adaptable and urban tolerant species such as Eastern Wood Pewee and bats.

3.5.5 Fish Habitat

The presence/absence of fish within Upper Hager Creek was determined during the field survey program and through background information sources. No fish species were observed within the watercourse during the field work program. The *Upper Hager Creek, Escarpment to Four Seasons Drive Class Environmental Assessment* (AMEC Foster Wheeler 2015) prepared for the City of Burlington states that there are no fisheries records for the subject watercourse and that there are several downstream barriers and constraints to upstream fish movement in the study area (e.g., Highway 403, QEW, culverts – Four Seasons Drive, Forestvale Drive, debris dams). Notwithstanding this, no direct or indirect impacts to the Upper Hager Creek are anticipated because of the proposed development.

4.0 ENVIRONMENTAL CONSTRAINT FRAMEWORK

The recommended environmental constraint framework for the proposed development is provided in Figure 4. The framework is based on the greater of stable top of bank plus 7.5 m or staked woodland dripline plus 10 m. Given the level of disturbance within the adjacent ravine and the low plant species richness/diversity, the proposed buffer from the woodland edge is considered appropriate to protect the natural heritage features/functions of the natural heritage system from negative impacts. Naturalization of the buffer area (discussed below) will provide an enhancement to the NHS over the current condition (i.e., asphalt parking area, commercial building, and day care playground partially located within the ravine setbacks – refer to Figure 5a).

Key features of the Regional NHS are shown on Figure 4a. The components of the Regional NHS on or adjacent to the site include the following:

- Significant woodland.
- Significant wildlife habitat.
- Valleyland (Upper Hager Creek Ravine).
- CH regulated watercourse (Upper Hager Creek).
- Linkages (Upper Hager Creek ravine system).
- Valleyland/Woodland buffers (currently comprised of asphalt parking, commercial building, and daycare playground).

Based on our interpretation of the Regional NHS on Map G of the Official Plan (2018), some minor refinements to the NHS boundary have resulted from the staking of the woodland dripline and the application of a 10 m buffer.

4.1 Development Proposal

The proposed development at 1600 Kerns Road is shown in Figure 5. It consists of the following features:

- A four-storey, 118-unit, retirement facility with one-level of underground parking and outdoor parking.
- Street access to Four Seasons Drive and Kerns Road.
- Outdoor amenity areas.
- Naturalized top of bank and woodland setback area.

The proposed development will connect to existing municipal infrastructure (water mains, sanitary sewers, storm sewers, utilities). A detailed description of the proposed servicing concept for the development is found in the Functional Servicing Report (FSR) and Stormwater Management (SWM) Report prepared by KWA (2022). Stormwater management criteria and water balance requirements are also provided. Key conclusions from the FSR/SWM report are provided below.

The proposed development will be serviced by existing service connections at the street. No grading or placement of fill is proposed within the woodland/ravine. Existing grades will be matched at the limit of grading, which generally coincides with the staked top of bank. The removal of three trees beyond the staked dripline is required to accommodate the grading for the proposed development, and to remove existing development within the 7.5 m top of bank setback (i.e., asphalt parking lot, commercial building, daycare playground). It is not feasible to avoid disturbance and tree removal within the valleyland/woodland setback given the existing development within the area that must be removed.

Overland sheet flow runoff from the 7.5 m buffer area will continue to drain towards the woodland/ravine edge in a diffuse, dissipated manner, similar to the pre-development condition. A grassed swale is proposed along the south property line which will outlet to the ravine slope in the southwest corner of the property. The swale will convey surface runoff from a small, landscaped catchment area. It is our understanding that the swale will only convey surface runoff associated with storm events greater than the 100-year event[5]. A level-spreader is proposed at the edge of the 7.5 m buffer to disperse and dissipate surface runoff and reduce the potential for erosion on the ravine slope from storm events that exceed the 100-year storm.

4.1.1 Buffer Width

The environmental protection/enhancement framework for the proposed development was based on the following criteria:

- 7.5 m stable top of bank setback.
- 10 m woodland (ravine) setback.

Given that the development proposal is a re-development of an existing commercial plaza to a retirement facility, no additional setbacks to the adjacent wooded ravine are recommended. The current condition does not include a buffer/setback to the ravine (refer to Figure 5a). Moreover, none of the single-family dwellings flanking the Upper Hager Creek ravine upstream and downstream of the proposed development

[5] Under existing conditions, the 100-year storm event would flow uncontrolled into the adjacent ravine.

provide a top of bank or woodland dripline setback. The application of the above setbacks provides an opportunity for enhancement of the NHS through naturalization of the setback/buffer, as well as restoration of open/disturbed ravine slopes (see below).

4.2 Functional Servicing and Stormwater Management

A Functional Servicing and Stormwater Management Report was prepared for the proposed development by KWA (2022). The key conclusions and recommendations from their report are as follows:

- The site consists of two drainage areas. The existing commercial plaza (north portion) and the parking area drain to catch basins that are connected to the Kerns Road storm sewer. The southern half of the commercial building and the rear entranceway drain to Upper Hager Creek. An existing catch basin outlets to the creek via a 25mm CSP located on the ravine slope.
- For areas draining to Kerns Road, stormwater quantity control will be achieved by attenuating post-development flow rates to pre-development flow rates through the use of a storage tank and orifice tube (flow restrictor).
- No storage or attenuation of post-development runoff is proposed for the portion of the site that drains to Upper Hager Creek. The area draining to the creek is predominantly the 7.5 m setback area, which is to be naturalized. A grassed swale is proposed along the southern property line, which will convey flow to the ravine from storms exceeding the 100-year event. A level-spreader is proposed at the edge of the 7.5 m setback to disperse/dissipate the flow and reduce the potential for slope erosion.
- Enhanced stormwater quality control (i.e., 80% removal of Total Suspended Solids) is proposed for the site.
- Runoff from the rooftop, landscape amenity and landscape areas are considered clean stormwater and will not require treatment.
- A treatment train approach consisting of oil and grit separators, bio-swales and filtration within the storage tank are proposed to achieve water quality control for hard surface areas.
- In terms of a water balance, EXP Services Inc. (2022) have concluded that there will be an increase in on-site infiltration (post-development) due to a reduction in impervious cover compared to the existing condition. Due to the increase in groundwater infiltration during the post development phase of the project, there will be no decrease in the groundwater discharge rates to Upper Hager Creek (EXP Services Inc. 2022).
- To meet the water balance objectives, a separate tank within the building or a section of the proposed stormwater tank used for quantity control will be used for rainwater harvesting. This rainwater harvesting tank will re-use stormwater to irrigate the perimeter landscaping proposed around the site.

KWA (2022) have concluded that the proposed development at 1600 Kerns Road can be serviced in accordance with City of Burlington standards. Refer to the FSR/SWM report (KWA 2022) for additional details.

4.3 Hydrogeology

A hydrogeology investigation of the subject property was completed by EXP Services Inc. (2022).

EXP Services Inc. (2022), predict that due to the increased infiltration rate in the post-development condition (i.e., less impervious cover), there will be no decrease in the groundwater discharge rates to Upper Hager Creek. Increased infiltration will be achieved in the proposed outdoor amenity areas, landscaped grounds, and naturalized ravine buffer/setback.

Due to the groundwater elevations on the site, dewatering of the excavation for the proposed building and underground parking garage will be necessary. EXP Services Inc. (2022) propose to use the Municipal storm sewer system to convey groundwater and stormwater from the open excavations. A permit To Take Water from MECP will be required for construction dewatering. To maintain water quality, EXP Services Inc. (2022) recommend an appropriate method to polish/filter collected groundwater before it discharges to the Municipal storm sewer system and downstream natural systems. Water quality monitoring will be required to determine the preferred method for mitigating elevated levels of Total Suspended Solids and heavy metals during construction dewatering and the post-construction phase.

EXP Services Inc. (2022) recommend the following:

- No uncontrolled stormwater should be discharged to the Upper Hager Creek ravine slope.
- No construction materials or stockpiles of fill should be placed within 10 m of the ravine slope or on the slope.
- Existing vegetation on the ravine slope should be maintained.
- Monitoring of dewatered groundwater quality during construction and post-construction.

Dewatering impacts to stream baseflow in Upper Hager Creek are not expected during construction activities or post-development (EXP Services Inc. 2022). The estimated maximum construction zone of influence extends approximately 40 m from the site boundary, which is expected for areas to be excavated without a caisson wall system. The dewatering zone of influence is predicted to be negligible outside of the area of the proposed caisson wall in the northern portion of the site (EXP Services Inc. 2022).

The quality of groundwater entering the Municipal storm sewer system must conform to City of Burlington and Halton Region By-law requirements. EXP Services Inc. (2022) recommend that water quality monitoring should be completed during construction dewatering and the post-construction phase.

Refer to EXP Services Inc. (2022) for additional details on the results and recommendations of the hydrogeological and water balance investigation.

4.4 Tree Inventory and Preservation Plan – Jackson Arboriculture Inc.

Refer to Appendix G for a discussion and analysis of potential impacts, tree removals and tree preservation relative to the proposed site development.

Tree Removals

Removal of Trees 1-7, 17, 17a, 19-24, 27-29, 35-39 and 41 will be required to accommodate the proposed development. Trees 17 and 17a are situated within the City road allowance and permission from the City is required prior to its removal. A restoration plan (see below) has been prepared outlining tree and shrub

plantings within the top-of-bank and woodland buffers. Trees identified for removal within the buffer for grading purposes (3 trees) will be replaced on a 3:1 basis within the buffer or ravine.

Tree Preservation

Preservation of Trees 8-16, 18, 18a, 25, 26, 30-34, 40 and 42 will be possible with appropriate tree protection measures. Tree protection measures will have to be implemented prior to the commencement of construction to ensure trees identified for preservation are not impacted by the proposed development.

Where trees are identified for preservation adjacent to the underground parking structures, vertical piles may be required to prevent the soil in the tree protection zone from collapsing into the area excavated to construct the parking structure. It appears that encroachment within the mTPZs of Trees 8, 10, 12, 14, 16, 18 and 18a will be required to accommodate the proposed development. The areas of encroachment are currently occupied by impermeable surfaces and as such there should be no impacts. If any roots are exposed during construction, they must be pruned by a Certified Arborist in accordance with good arboricultural practice.

Refer to Figure 1 (Appendix G) for the prescribed location of tree protection fencing, the tree protection fence detail, and additional tree preservation notes.

Woodland/Ravine Edge Management

On-site restoration and enhancement opportunities for the adjacent woodland/ravine are provided below in Section 4.7. The proposed development setbacks provide an opportunity for i) rehabilitation and restoration of the woodland edge with locally indigenous plant species and ii) infiltration of clean runoff. Opportunities for restoration and enhancement of open/disturbed ravine slopes has also been addressed.

4.5 Potential Impacts

Appendix H provides a definition of direct, indirect, and cumulative impacts. Potential impacts associated with the proposed re-development of the subject property are listed. Mitigation measures to avoid or minimize negative impacts to RNHS features and functions are also provided. The outline is based on the information provided in the Region of Halton *Environmental Impact Assessment Guideline* (2020). Additional details on potential impacts and mitigation measures are provided in the sections below.

The limits of development, as shown on Figure 5, are based on the results of a *Slope Stability Analysis* conducted by EXP Services Inc. (2022). The long-term stable top of bank line plus a 7.5 m buffer was identified as the "limits of development" for the subject property. A 10 m buffer has been provided from the dripline of the edge of the ravine, where feasible. The setback requirements are based on current agency standards and policies.

No development is proposed within the 7.5 m top of bank setback. Figure 5 shows the extent of development that is proposed within the woodland (ravine) dripline setback area[6]. The edge of the proposed building and outdoor amenity areas partially extend into the 10 m woodland setback. It should be noted that the area in question is currently occupied by an asphalt parking lot, the corner of the existing

[6] Reductions in the 10 m woodland buffer occur in the middle portion of the property over a length of approximately 45 m or 50% of the buffer/development interface.

commercial building, and a daycare playground (refer to Figure 5a). Construction and disturbance within the top of bank and woodland setback areas will be required for the following activities:

- Removal of existing asphalt parking lot.
- Demolition of existing building.
- Removal of catch basin and decommissioning of outlet pipe to Upper Hager Creek (SW corner of property[7]).
- Temporary work zone for construction of the 4-storey building and related infrastructure (located outside of the 7.5 m top of bank setback).
- Installation of a level-spreader (outside of the 7.5 m top of bank setback).
- Final grading and landscaping of the setback area.

A detailed description of tree removals, tree hazard abatement measures, and tree protection measures along the development/ravine interface is provided under separate cover in the *Tree Inventory and Preservation Plan Report* (Jackson Arboriculture Inc. 2022).

The Upper Hager Creek ravine provides an important migratory bird stopover function during the spring and fall. The wooded ravine also provide habitat for summer and winter resident birds. To reduce the potential for birds striking the proposed building, *City of Toronto Bird Friendly Guidelines* should be incorporated into the final design.

Based on our understanding of the site characteristics and the proposed stormwater management scheme, surface water and groundwater quality/quantity control can be achieved in accordance with City of Burlington and CH guidelines. Given the proximity of Upper Hager Creek, it is important that the groundwater recharge/discharge function of the site is maintained and "enhanced", where feasible. Low impact development (LID) stormwater management measures, as described in the FSR/SWM report (KWA 2022), should be utilized to the extent possible to protect and enhance stream baseflow and water quality in Upper Hager Creek. Potential impacts to the groundwater regime are addressed under separate cover by EXP Services Inc. (2022).

4.6 Mitigation Measures

The following section provides an overview of the recommended mitigation measures for the proposed development at 1600 Kerns Road.

An Erosion and Sediment Control program should be implemented throughout the duration of construction, in accordance with City of Burlington and CH standard practices. The proposed Erosion and Sediment Control program for the site should include the following temporary measures to protect the adjacent wooded ravine and Upper Hager Creek:

- Installation of an erosion/siltation control barrier and tree protection measures around the perimeter of the site. Refer to Appendix I for a Construction Management and Mobility Plan.
- Sediment traps on internal catch basins and external catch basins adjacent to the site.

[7] To avoid negative impacts to the ravine, it is recommended that the end of the pipe be capped with clean stone, and that the work is completed by hand.

- Mud mat(s) at the access point(s) of the site to prevent mud tracking by construction vehicles.
- On-site dust control measures.
- Regular site inspection and maintenance of the above-listed Erosion/Sediment Control and tree protection measures.

The recommended stormwater management measures (described above) should be implemented to maintain/enhance the pre-development groundwater recharge/discharge regime and to maintain/enhance surface water quality in Upper Hager Creek. In addition, snow storage should not occur within or adjacent to the ravine setback (refer to proposed site plan for snow storage locations).

Suitable treatment methods (filtration/decantation) combined with water quality monitoring should be implemented for construction dewatering and the post-construction phase to control the concentrations of Total Suspended Solids and heavy metals discharged to the storm sewer system and downstream natural systems.

The following tree protection measures are recommended (Source: Jackson Arboriculture Inc. 2022):

- Tree protection fence must be installed at the mTPZ distances and locations outlined in Table 1 and on Figure 1 of the *Tree Inventory and Preservation Report* prior to the commencement of demolition, unless noted otherwise in this report and on Figure 1.
- Once tree protection fence has been installed it must not be moved, relocated, or altered in any way (unless repairing fallen fence etc.) for the duration of the construction period.
- No intrusion into an area identified on Figure 1 as a tree preservation zone (TPZ) is allowed at anytime during construction.
- No storage of machinery, construction debris, materials, waste, or any other items is allowed within a TPZ.
- Any tree branches (and roots) that conflict with proposed development must be pruned by a Certified Arborist in accordance with good arboricultural practice.
- Tree protection fencing should be inspected by a Certified Arborist prior to and during construction to ensure that the fencing remains intact and in good repair throughout the stages of development.

In addition to the above, trees to be removed within the buffer for grading purposes should be felled away from the edge of the ravine to avoid impacts to trees to be protected.

4.7 Restoration & Enhancement Opportunities

Based on our site observations, restoration and enhancement opportunities identified within the Upper Hager Creek ravine include the following:

- Naturalization of the ravine setback area with locally indigenous plant species, following *Conservation Halton Landscaping and Tree Preservation Guidelines* (2010).
- Targeted invasive species removal and replacement with locally indigenous plant species.
- Removal of debris/garbage from the ravine.
- Removal (capping) of the 25mm CSP outlet from the upper ravine slope (SW corner of the site).

- Replacement plantings (on a minimum 3:1 ratio basis) for trees to be removed to accommodate building demolition, building construction, and grading within the 7.5 m top of bank setback area. The greater of the City of Burlington By-law requirements for tree replacement or CH standards should be applied.

The proposed setback from the Upper Hager Creek ravine represents a good candidate for naturalization with locally indigenous plant species. A conceptual planting plan for the setback area is shown in Figure 6. The proposed buffer restoration plan is based on the *Conservation Halton Landscaping and Tree Preservation Guidelines (2010)*, as it relates to species selection and planting densities. The total restored buffer area, which includes open/disturbed ravine slope, is 1027 m^2 (Figure 6), which represents an enhancement to the NHS compared to the current site conditions (i.e., unnaturalized buffer of which 350 m^2 is comprised of impervious cover such as asphalt and concrete). The ravine slope restoration component (i.e., below staked top of bank) is approximately 325 m^2 in area.

The following tree and shrub species are recommended for restoration of the ravine setback area and the open/disturbed portions of the ravine slope:

Native Trees	**Native Shrubs**
Sugar Maple	Smooth Serviceberry
White Oak	Nannyberry
White Pine	Maple-leaved Viburnum
Trembling Aspen	Red Elderberry
Black Walnut	American Witch-hazel
	Grey Dogwood

Invasive plant species such as Garlic Mustard, Dog-strangling Vine and Urban Avens should be removed from the ravine slopes and bottomland areas prior to planting.

Prior to occupancy, garbage/debris from the woodland edge and ravine slopes should be removed. The buffer should be densely planted with native trees and shrubs to deter pedestrian access to the wooded ravine. In accordance with *O. Reg. 162/06*, a permit will be required from Conservation Halton for site alteration within 7.5 m of the stable top of bank.

The preparation of a detailed restoration and enhancement plan for the Upper Hager Creek ravine and setback area should be made a condition of site plan approval.

4.8 Grading Control within 7.5 m Setback

The ravine slopes flanking the site are steep and prone to erosion. Grading within the tableland portion of the site should ensure that there is no overland flow of surface runoff to the valley slopes during construction or post-construction. Grade changes within the 7.5 m setback area should therefore be kept to a minimum. Any proposed works within the top of bank setback area (e.g., removal of existing building, parking area and sub-grade, grading, landscaping) will require a permit from Conservation Halton. Erosion and siltation control measures, following City of Burlington and CH standards, should be installed at the greater of staked woodland dripline or staked top of bank, and maintained until the buffer is stabilized.

4.9 Pedestrian and Companion Animal Control

To deter human and companion animal access to the Upper Hager Creek ravine, we recommend that an appropriate fence (or dense shrub plantings – i.e., Living Fence) should be incorporated into the site plan along the edge of the top of bank. Interpretative signage that demonstrates the significance/sensitivity of the adjacent ravine and provides an outline of appropriate stewardship behavior by the public should be installed at the edge of the setback area and within the proposed outdoor amenity areas. These recommendations have the potential to provide important environmental educational opportunities for the residents and the public about the Upper Hager Creek ravine ecosystem.

4.10 Species at Risk and Significant Wildlife Habitat Considerations

As noted above, no loss of habitat is proposed within the wooded ravine that flanks the proposed development. The subject site is currently occupied by a commercial shopping plaza. Low and medium density residential development exists on both sides of the wooded ravine, both upstream and downstream of the subject property. Opportunities exist for habitat enhancement within the ravine setback area and within the open/disturbed slopes.

Considering the above, negative impacts to species at risk and significant wildlife habitat are not anticipated because of the proposed development. A minimum 7.5 m naturalized setback will be maintained between the proposed development and the edge of the Upper Hager Creek ravine.

4.11 Potential Impacts to Birds

As noted above, the proposed development of a 4-storey building increases the potential for bird strikes due to the proximity of the adjacent wooded ravine. To address this concern, it is recommended that bird friendly building design standards, following the City of Toronto Guidelines, be implemented, where feasible and appropriate, for the proposed development. These measures include low reflective glass windows, low level outdoor lighting, and window treatments, among others.

4.12 Performance Monitoring

Post-development monitoring of the proposed buffer and ravine restoration plan presented in Figure 6 is recommended. The monitoring should follow Conservation Halton's Ecological Monitoring Protocols (2017). The requirement for post-development monitoring of the restoration plantings should be made as a condition of site plan approval. The monitoring program should include the following:

- fixed-point photographs of the restored buffer and ravine slopes.
- an assessment of plant health/establishment.
- Identification of site disturbances.
- an assessment of the effectiveness of invasive plant species removal; and,
- Impact contingency recommendations, where required, to address any issues identified during the 5-year monitoring program (i.e., adaptive management).

The monitoring program should continue for a period of five (5) years. Annual monitoring reports should be provided to the agencies for review.

5.0 POLICY CONFORMITY

The following section demonstrates how the proposed development complies with the environmental policy regime outlined in Section 1.2 above.

Federal Fisheries Act (2019)

The proposed development will not result in any loss of direct or indirect fish habitat functions within Upper Hager Creek. No alterations to the Upper Hager Creek stream channel or ravine slope are proposed. The Upper Hager Creek ravine will be protected by a 7.5 m stable top of bank setback or a 10 m woodland dripline setback (throughout the majority of the site). The proposed setbacks will be naturalized with locally indigenous species (refer to Figure 6). No untreated stormwater runoff will be directed to Upper Hager Creek. On-site treatment of runoff is proposed before it is conveyed to the Municipal storm sewer system. Infiltration within the proposed setback/buffer will enhance groundwater discharge to Upper Hager Creek, which is an improvement over the existing condition (i.e., impervious cover associated with commercial plaza).

Given the above, the proposed development is not in contravention of the Federal Fisheries Act.

Migratory Birds Convention Act (1994)

The Upper Hager Creek ravine and surrounding developed areas provide a stopover habitat function for migratory birds in the spring and the fall. The proximity of Lake Ontario and the Niagara Escarpment enhances this function. No removal of trees within the Upper Hager Creek ravine is required as part of the proposed development. The wooded ravine will be protected by a 7.5 m stable top of bank setback or a 10 m woodland dripline setback.

Removal of trees within the ravine setback, along the south property line (beyond the setbacks), and along the street frontage is required to accommodate the proposed development. In view of this, tree removals should not occur between early-April and the end of August. This mitigation measure will ensure that the proposed development does not contravene the Migratory Birds Convention Act.

Provincial Endangered Species Act (2019)

No endangered or threatened species protected under the Endangered Species Act were recorded from the subject property or the adjacent Upper Hager Creek ravine. The wooded ravine will be protected by setbacks/buffers, as outlined above. In our opinion, the proposed development of the subject property does not contravene the Provincial Endangered Species Act.

Planning Act and Provincial Policy Statement (2020)

The Upper Hager Creek ravine contains the following natural heritage features/functions, as defined by the Provincial Policy Statement (2020):

- Significant woodland (potential).
- Significant wildlife habitat.
- Significant valleyland (potential).
- Fish habitat (indirect contribution, future potential).

As noted above, the Upper Hager Creek will be retained and protected with a 7.5 m stable top of bank setback or a 10 m woodland dripline setback (throughout the majority of the site). No development or loss of habitat is proposed or required within the Upper Hager Creek ravine. As a result, there will be no negative impacts to significant woodland or significant valleyland features or functions. The proposed setback area will be naturalized with locally indigenous plant species, which will enhance the overall function of the Upper Hager Creek ravine.

With respect to fish habitat, as noted above there will be no loss of fish habitat or fish habitat functions associated with the proposed development. A combination of naturalized setbacks, infiltration, and stormwater management measures are proposed to protect Upper Hager Creek from negative impacts.

Eastern Wood Pewee, a bird species of Special Concern, was recorded from the Upper Hager Creek ravine, downstream of the subject property. The presence of a species of Special Concern triggers significant wildlife habitat under the Provincial Policy Statement. Negative impacts to this species are not anticipated as there will be no loss of habitat within the wooded ravine. The proposed land use, a retirement home, is similar in character to the surrounding residential neighbourhood. Furthermore, Eastern Wood Pewee is an adaptable species that frequently utilizes wooded habitat within urban areas. The naturalization of the ravine setback area with locally indigenous plant species will, over time, provide some local habitat enhancement for this species.

Policies related to water and natural hazards have been addressed through the proposed stormwater and groundwater management measures and the proposed setbacks from the edge of the regulated ravine feature.

In our opinion, the proposed development is consistent with the Provincial Policy Statement as there will be no negative impacts to natural heritage features or functions associated with the Upper Hager Creek ravine.

Growth Plan for the Greater Golden Horseshoe (2019)

The subject property is located within a Settlement Area of the Growth Plan for the Greater Golden Horseshoe. No portion of the study area is located within the Growth Plan NHS. In accordance with Section 4.2.2.6 of the Growth Plan, the PPS policies, as well as local policies, will apply to protect natural heritage features and areas. As discussed herein, the Upper Hager Creek ravine will be protected with restored setbacks/buffer, which will provide an enhancement to the NHS over the existing condition (i.e., commercial shopping plaza).

Region of Halton Official Plan (2018)

As noted above, the Upper Hager Creek ravine is a key component of the Region of Halton's Natural Heritage System. The ravine meets the Region's definition of "significant woodland" plus it supports significant wildlife habitat functions under the Provincial Policy Statement (i.e., habitat for a bird species of Special Concern).

As outlined above, negative impacts to the Upper Hager Creek ravine from the proposed development are not anticipated. The wooded ravine will be protected by a 7.5 m stable top of bank setback or a 10 m woodland dripline setback (throughout the majority of the site). The proposed setbacks will be naturalized with locally indigenous plant species, which will provide an enhancement over the existing

condition (i.e., commercial shopping plaza). Infiltration within the setback area will enhance groundwater discharge to Upper Hager Creek.

In our opinion, the proposed development complies with the natural heritage policies of the Region of Halton Official Plan.

City of Burlington Official Plan (2020)

The Upper Hager Creek ravine is part of the City of Burlington's natural heritage system. As noted above, the proposed development complies with the hierarchy of natural heritage policies that apply to the subject development application. The Upper Hager Creek ravine will be protected with buffers/setbacks that will be naturalized, which will provide an enhancement over current site conditions. Infiltration within the naturalized setback will enhance groundwater discharge to Upper Hager Creek. On-site stormwater management measures are proposed to collect and polish runoff before it discharges to the Municipal storm sewer system. No intrusion within the Upper Hager Creek ravine is proposed or required to accommodate the proposed development.

Given the above, it is our considered opinion that the proposed development complies with the natural heritage policies of the City of Burlington Official Plan.

Conservation Halton

Upper Hager Creek and its associated valley feature is regulated by Conservation Halton under Ontario Regulation 162/06. The framework for the proposed development was established in consultation with CH staff during a top of bank and woodland dripline staking exercise. A slope stability analysis completed by EXP (2022) has determined that for the majority of the site the physical top of bank is stable, however, for a short reach of the valley feature, stable top of slope exceeds the physical top of bank. A 7.5 m setback from the greater of physical or stable top of bank has been used for the proposed site plan. Except for minor grading to remove existing development within the 7.5 m setback and re-grade the lands, no development is proposed within the 7.5 m stable top of bank setback. The setback area will be naturalized with locally indigenous plant species and will provide a natural infiltration function to support groundwater discharge to Upper Hager Creek.

In our opinion, the proposed development complies with CH policies/guidelines as it relates to development and site alteration within hazardous lands. A permit under O. Reg. 162/06 will be required from CH prior to site alteration and grading within the 7.5 m regulated setback.

Summary

As discussed above, no development intrusion within "significant" woodland or "significant" wildlife habitat (i.e., key features of the Region of Halton and City of Burlington NHS) are required to accommodate the proposed re-development of the site. The development will be confined to the footprint of an existing developed property (i.e., commercial plaza) that is flanked by a wooded ravine on the west. The limits of development are based on a 7.5 m buffer from the stable top of slope or 10 m from the staked woodland dripline (throughout the majority of the site). Minor intrusion within the 10 m woodland buffer is required for the proposed building and grading purposes. Restoration of the buffer and open/disturbed sections of the ravine slope is proposed, which is an enhancement compared to the existing site conditions (i.e., development within the buffer).

In our opinion, an appropriate level of protection has been provided to the Upper Hager Creek ravine and no negative impacts (i.e., direct, indirect, or cumulative) to ecological features or functions are anticipated. Therefore, it is our opinion that the proposed development should be approved with conditions (as outlined below) as it complies with the natural heritage and natural hazard policies of the Province, the Region of Halton, the City of Burlington, and Conservation Halton.

6.0 SUMMARY & CONCLUSIONS

This Environmental Impact Assessment (EIA) has been prepared for a proposed re-development of an existing commercial property located at 1600 Kerns Road in the City of Burlington. A 4-storey retirement home with at-grade/underground parking and outdoor amenity areas is proposed for the site.

The subject property is located at the southwest corner of Kerns Road and Four Seasons Drive and contains an existing commercial plaza with parking (Figure 1a). The western edge of the property contains a section of the Upper Hager Creek ravine. The ravine is part of a larger forested valley system located within the Tyandaga Neighbourhood that is designated as Regional Natural Heritage System on Map 1 in the 2018 Region of Halton Official Plan (ROP). Adjacent land uses include single-detached residential to the north, east, and west, and townhouse residential units to the south. The City of Burlington Official Plan designates the subject lands as Neighbourhood Commercial.

The top of bank and woodland dripline on the subject property were staked by Conservation Halton and Region of Halton staff, respectively, on November 29th, 2019. The staked top of bank and dripline was subsequently surveyed by J. D. Barnes Limited. The location of the staked top of bank and the woodland dripline are shown on Figure 1b. The proposed development is subject to Conservation Halton policy and permitting requirements under *O. Reg. 162/06 – Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses Regulation*.

Based on the results of the EIA, we have concluded that the wooded ravine meets the Region of Halton's definition of "significant woodland". The feature also meets the Province's definition of "significant wildlife habitat". No endangered or threatened species protected under the *ESA* were recorded from the subject property or adjacent lands. Eastern Wood Pewee, a bird species of Special Concern (SARO), was recorded to the south of the subject property, within the Upper Hager Creek Ravine. Negative impacts to this species are not anticipated as the Upper Hager Creek ravine will be protected and enhanced (over time) through naturalization of the minimum 7.5 m setback area and open/disturbed sections of the ravine slope.

Given that the proposed development is a re-development of an existing commercial plaza, the recommended buffer framework for the site plan was as follows:

- 7.5 m stable top of bank setback.
- 10 m woodland dripline buffer (throughout the majority of the site).

The proposed site plan respects a 7.5 m setback from the stable top of bank line (refer to Figure 5). Minor encroachment into the 10 m woodland buffer is required to accommodate the proposed development, however, the areas in question are mainly impermeable under existing conditions (i.e., asphalt parking area). A buffer and ravine restoration plan (refer to Figure 6) is proposed to achieve an enhancement to the NHS over the current condition (i.e., commercial plaza with no restored buffer/setback). Open and disturbed portions of the ravine slope are also proposed to be rehabilitated (i.e., garbage/debris removal,

removal of invasive species) and re-planted with locally indigenous plant species. The recommended restoration plan is based on CH Landscaping and Tree Preservation Guidelines.

EXP Services Inc. (2022), predict that due to the increased infiltration rate in the post-development condition (i.e., less impervious cover), there will be no decrease in the groundwater discharge rates to Upper Hager Creek. Increased infiltration will be achieved in the proposed outdoor amenity areas, landscaped grounds, and naturalized ravine buffer/setback.

KWA (2022) have concluded that the proposed development can be serviced in accordance with City of Burlington and Conservation Halton standards. No stormwater outlets are proposed within the Upper Hager Creek ravine. Post-development flows will be attenuated to pre-development rates. A treatment train approach is proposed to address water quality requirements.

The following mitigation and environmental management measures are recommended to avoid or minimize negative impacts to the natural heritage system and ensure policy compliance. A summary table of the proposed mitigation measures is provided in Appendix H.

- Locally indigenous plant species should be used in the planting plan for the proposed outdoor amenity areas and the minimum 7.5 m top of bank setback. The restoration plan should be based on CH Landscaping and Tree Preservation Guidelines
- Removal of garbage/debris and invasive plant species from the ravine (e.g., Garlic Mustard, Urban Avens, Dame's Rocket and Dog-strangling Vine).
- Grading within the 7.5 m top of bank setback area should not promote additional overland surface runoff towards steep/erodible ravine slopes, as compared to existing conditions. No construction materials or stockpiles of fill should be placed within 10 m of the ravine slope or on the slope.
- Pedestrian and companion animal access to the ravine should be restricted by appropriate design features along the setback limit (e.g., permanent fencing, thicket forming shrubs – Living Fence).
- LID stormwater management measures (e.g., bio-swales) should be implemented outside of the NHS (where feasible) to maintain/enhance surface water and groundwater quality/quantity.
- Erosion/siltation control and tree protection measures following City of Burlington and CH standards should be implemented and regularly inspected during all phases of construction. Refer to the *Tree Inventory and Preservation Plan Report* (Jackson Arboriculture Inc. 2022) for details related to tree protection during construction.
- Interpretative signage that i) describes the significance/sensitivity of the Upper Hager Creek ravine, and ii) provides examples of appropriate environmental stewardship behavior by the public, should be installed in the outdoor amenity areas, and along the edge of the 7.5 m setback.
- Window treatments and low-level lighting to prevent bird strikes of the proposed 4-storey building.
- Performance monitoring of buffer/ravine plantings (5 years) following CH Guidelines.

Based on the above, it is our considered opinion that the proposed development is consistent with the natural heritage and natural hazard policy and regulatory regime, as outlined above in Sections 1.2 and 4.6. Recommended mitigation and environmental management measures have been provided and should be made a condition of site plan approval.

Given that the proposed development will not result in negative impacts to natural heritage system features or functions, as per the Provincial Policy Statement (2020), the Region of Halton Official Plan (2018) and the City of Burlington Official Plan (2020), it is our recommendation that the proposed development should be approved, subject to the conditions of site plan approval, as outlined above.

Respectfully submitted by,

PLAN B Natural Heritage

Brad D. Bricker, M.Sc.
Certified Senior Ecologist (ESA)

References:

Adesso Design Inc. 2021. Landscape Plan.

AMEC Foster Wheeler. 2015. Upper Hager Creek, Escarpment to Four Seasons Drive Class Environmental Assessment, City of Burlington.

Cadman, M. D., D. A. Sutherland, G. G. Beck, D. Lepage, and A. R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001–2005. Bird Studies Canada, Port Rowan, Ontario, Canada.

City of Burlington Official Plan. 2020.

Conservation Authorities Act.

Conservation Halton Landscaping and Tree Preservation Guidelines. 2010. Conservation Halton.

Conservation Halton Ecological Monitoring Protocols. 2017. Conservation Halton

Crins, W.J., W.D. McIlveen, A.G. Goodban and P.G. O'Hara. 2006. The Vascular Plants of Halton Region, Ontario. pp. 1-79 In: Dwyer, J.K. (ed.), Halton Natural Areas Inventory 2006: Volume 2 – Species Checklists. Halton/North Peel Naturalists' Club, South Peel Naturalists' Club, Hamilton Naturalists' Club, Conservation Halton and the Regional Municipality of Halton.

Department of Fisheries and Oceans. 2020. Aquatic Species at Risk Mapping.

Endangered Species Act. 2019. Province of Ontario.

EXP Services Inc. 2022. Slope Stability Analysis.

EXP Services Inc. 2022. Hydrogeological and Water Balance Calculation.

Federal Fisheries Act. 2019. Department of Fisheries and Ocean.

Gillespie, J.E., R.E. Wicklund and M.H. Miller. 1971. Soil Survey of Halton County. Report No. 43 of the Ontario Soil Survey. Prepared jointly by the Research Branch, Canada Department of Agriculture and the Ontario Agricultural College. Guelph, Ontario. 79 pp. + map.

Growth Plan for the Greater Golden Horseshoe. 2019. Ministry of Municipal Affairs and Housing.

Jackson Arboriculture Inc. 2022. Tree Inventory and Preservation Plan.

KWA. 2022. Functional Servicing and Stormwater Management Report.

Land Information Ontario. 2020. Ministry of Natural Resources and Forestry.

Lee, H.T., W.D. Bakowsky, J.L. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02. 225 pp.

Make a Natural Heritage Area Map. 2020. Ministry of Natural Resources and Forestry.

Migratory Birds Convention Act. 1994. Government of Canada.

Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 1995. Floristic Quality Assessment System for Southern Ontario. Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario. 68 pp + computer disk.

Oldham, M.J. and S.R. Brinker. 2009. Rare Vascular Plants of Ontario, Fourth Edition. Ontario Ministry of Natural Resources, Peterborough, Ontario. 188 pp.

Ontario Regulation 162/06. Halton Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. 2013. Province of Ontario.

Natural Heritage Reference Manual to the Provincial Policy Statement. 2010. Ministry of Natural Resources.

Planning Act. 2020. Province of Ontario.

Provincial Policy Statement. 2020. Ministry of Municipal Affairs and Housing.

Region of Halton Official Plan. 2018.

Region of Halton. 2020. Environmental Impact Assessment Guideline.

Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. 2015. Ministry of Natural Resources.

Appendices:

Appendix A – EIA Terms of Reference

Appendix B – Project Team CV's

Appendix C – Site Photographs

Appendix D – ELC Data Cards and Field Notes

Appendix E – Vascular Plant Species Checklist

Appendix F – Bird Survey Results

Appendix G – Tree Inventory and Preservation Plan (Jackson Arboriculture Inc.)

Appendix H – Impact Assessment and Mitigation Measures

Appendix I – Construction Management and Mobility Plan

PLAN B Natural Heritage

March 9, 2020

Adam Huycke, MCIP, RPP
Senior Planner
Planning Services
Legislative & Planning Services
Halton Region
1151 Bronte Road
Oakville ON L6M3L1

Dear Mr. Huycke:

Re: 1600 Kerns Road, City of Burlington
EIA Terms of Reference

Introduction & Background

The following EIA Terms of Reference (ToR) has been prepared for a proposed re-development of an existing commercial property located at 1600 Kerns Road in the City of Burlington. The subject property is located at the southwest corner of Kerns Road and Four Seasons Drive and contains an existing commercial plaza with parking. The western edge of the property contains a section of the Upper Hager Creek ravine. The ravine is part of a larger forested valley system located within the Tyandaga Neighbourhood that is designated as Regional Natural Heritage System on Map 1 in the Region of Halton Official Plan (ROP).

Adjacent land uses include single-detached residential to the north, east, and west and townhouse residential units to the south.

The top of bank and woodland dripline on the subject property was staked by Conservation Halton and Region of Halton staff, respectively, on November 29th, 2019. The staked top of bank and dripline was subsequently surveyed by J. D. Barnes Limited. The location of the staked top of bank and the woodland dripline are shown on Figure 1 (attached).

EIA Content

Development applications located on lands "adjacent" to a natural heritage feature, such as a woodland or valleyland, are subject to the preparation of an EIA, in accordance with the policies and guidelines of the Region of Halton, the City of Burlington and Conservation Halton. Given that the proposed re-development is a conversion of an existing, developed commercial lot (plaza), and that no intrusion is proposed within the wooded, ravine slope portion of the lot, it was agreed at the November 29, 2019 site meeting that a "scoped" level of effort for the EIA

Landscape Ecology and Natural Heritage Planning

176 Fellowes Crescent, Waterdown, ON, L0R 2H3
T: 905-689-0793 F: 905-689-9216 E: bbricker@planbnh.ca

would be reasonable. The following ToR reflect the agreed upon scope of study. The EIA will be prepared in accordance with the Region's EIA Guidelines and will address relevant policies and EIA triggers in the Halton Region OP, 2009 (June 19, 2019 Office Consolidation).

EIA Terms of Reference – 1600 Kerns Road, City of Burlington

Introduction

This section will include a description of the site location, existing land use, the proposed development and an overview of the discussions that have taken place to date with respect to the EIA. A figure will identify the study area boundary and the rationale for the study area extent. The policy requirements for the EIA will be outlined and this section will reference the approved ToR, which will be appended to the EIA.

Features identified as Key Features, as illustrated on Map 1G of the 2009 ROP, include:

- Candidate significant woodlands;
- Potential habitat of endangered or threatened species;
- Potential significant wildlife habitat;
- Potential significant valleylands; and,
- Potential fish habitat.

Approach

This section will include a review and analysis of the applicable Federal, Provincial, Regional, Municipal and Conservation Authority legislation and policies. This section will also include an overview of the known Key Features that may be on the subject property, that are part of the Regional NHS (RNHS), and will also provide an overview of those Key Features that may be on, or within 120m of, the proposed development.

Biophysical Summary

This section will summarize information that is readily available pertaining to the subject property from existing sources. This will include the Province's LIO database/mapping and data/mapping that may be available from Conservation Halton and/or the Region. In addition, this section will include a complete biophysical inventory detailing the following field inventories:

- Dripline of the woodland and top of bank as staked and approved by the Region of Halton and Conservation Halton, respectively, on November 29, 2019;
- Vegetation survey (spring, summer, fall) of plants within the ravine and top of bank portion of the subject property. The vegetation communities on and abutting the

176 Fellowes Crescent, Waterdown, ON, L0R 2H3
T: 905-689-0793 F: 905-689-9216 E: bbricker@planbnh.ca

property will be described and mapped following the Ecological Land Classification System for Southern Ontario (Lee et al. 1989).

- Breeding bird survey following Ontario Breeding Bird Atlas protocol (2 surveys between mid-May and mid-July).
- Bat habitat assessment – an assessment of the suitability of the adjacent ravine to support summer maternity and roosting habitat for bats.
- Fish habitat assessment – an assessment of fish habitat within Upper Hager Creek will be completed based on reconnaissance level investigations and existing background information. If a stormwater outfall is required in the ravine, the scope of the fish habitat assessment will be re-visited with Conservation Halton staff.
- Incidental wildlife observations will be recorded during all field survey work.

The Significant Wildlife Habitat (SWH) Criteria Schedules for Ecoregion 7E (2015) will be referenced and pertinent studies performed to confirm the presence of significant wildlife habitat on and/or adjacent to the site such as special concern species. The report will justify the level of investigation undertaken, including reasons for excluding any of the typical surveys as outlined in the SWH Criteria Schedules.

The top of bank was staked by Conservation Halton on November 29, 2019 and this limit will be used to identify the physical limits of the valley. A stable top of bank assessment will be undertaken separately as part of the planning submission. The stable top of bank, as determined through the geotechnical assessment, will be delineated on the constraints plan within the EIA.

Should a stormwater outfall be proposed within the valley, a tree inventory and preservation plan will be prepared that determines the trees that will be impacted and appropriate mitigation measures.

The information in this section will be supplemented with figures and tables as appropriate.

Species-at-Risk

MECP staff will be contacted to determine if they have any records of species-at-risk within the vicinity of the subject property. The Region of Halton have specifically requested that Endangered bat species and butternut be addressed as part of the EIA. Irrespective of whether the subject woodland functions as summer maternity and/or roosting habitat for bats, no development intrusion or tree removal is proposed within the woodland feature. We would also point out that the woodland on the subject property is part of a larger forest block, and that due to multiple ownership of the valley upstream and downstream, it would not be possible to conduct a fulsome tree cavity survey to confirm whether the woodland qualifies as candidate significant wildlife habitat for bats. As a result, some assumptions may need to be made in this regard.

176 Fellowes Crescent, Waterdown, ON, L0R 2H3
T: 905-689-0793 F: 905-689-9216 E: bbricker@planbnh.ca

The presence of butternut trees will be identified through the tree inventory. A high-level assessment of bat habitat will be completed to determine if follow-up acoustic surveys are required.

The results of the MECP species-at-risk screening will be addressed in the EIA. MECP will be provided with a copy of the proposed development plan and an *ESA* screening analysis to determine if any further work or special mitigation measures are required for species-at-risk, including bats.

Biophysical Summary Analysis

The information gathered as part of the Biophysical Summary will be used to undertake an analysis of significant natural heritage features and functions, as defined in the Provincial Policy Statement (PPS) and the Region's Official Plan.

The analysis will be based on current Provincial plans, policy, guidelines, technical documents and legislation including:

- PPS (2014);
- Natural Heritage Reference Manual (OMNR 2010);
- Significant Wildlife Habitat Technical Guide (OMNR 2000), Significant Wildlife Habitat Mitigation Support Tool (MNRF 2014), Significant Wildlife Habitat Criteria Schedules (MNRF 2015);
- *Endangered Species Act*;
- *Fisheries Act*;
- City of Burlington Official Plan; and,
- Region of Halton Official Plan.

If any refinements to the RNHS are proposed, these refinements will be explained in this section and shown on an associated figure.

Significant Woodlands

As noted above, the subject woodland will be assessed to determine if it meets the Region of Halton Official Plan definition of "significant" woodland.

Significant Wildlife Habitat

Based on the results of the in-season field surveys and habitat assessments, an opinion will be provided as to whether the subject woodland/ravine is considered significant wildlife habitat, as per the Provincial Policy Statement (2014) and its associated technical manuals.

176 Fellowes Crescent, Waterdown, ON, L0R 2H3
T: 905-689-0793 F: 905-689-9216 E: bbricker@planbnh.ca

Tree Inventory

An inventory of trees within and adjacent to the proposed development envelope will be included as part of the EIA. The tree inventory will follow the City of Burlington guidelines and will include measures to protect trees that are proposed to be retained. An assessment of potential hazard trees within the woodland edge that flanks the proposed development will also be completed. Tree hazard abatement measures will be provided, where necessary.

Buffer Width

The EIA will include a section on setbacks/buffers to natural heritage and natural hazard features on the subject property. A defensible rationale will be provided for the buffer width provided by the proposed development.

Development Proposal Description and Impact Avoidance & Mitigation Measures

This section will; i) describe the proposed development, ii) evaluate the potential impacts of the proposed development (i.e. direct, indirect, cumulative and induced), and iii) provide appropriate mitigation measures to avoid or minimize impacts to natural heritage system features and functions. The impact assessment will be based on our understanding of the ecological features/functions of the subject woodland/valleyland, the MECP species-at-risk screening exercise, the nature of the proposed development and the development footprint, buffers/setbacks, and the supporting engineering technical studies (i.e. hydrogeology, geotechnical, stormwater management). Potential impacts of the proposed development on wildlife habitat, including birds, bats and species-at-risk, will also be addressed. Appropriate mitigation measures will be provided, including consideration of best practices for bird friendly building design.

On-site Restoration/Enhancement Opportunities

The EIA will provide recommendations, where appropriate, for the restoration and/or enhancement of the subject woodland/valleyland (i.e. adjacent to the proposed development) and the proposed setback/buffer areas. Conservation Halton's Landscaping and Tree Preservation Guidelines will be referenced.

Monitoring

This section will detail the proposed post-development monitoring associated with any areas of restoration and/or associated with stormwater management (if applicable). When preparing this section, reference will be made to CH's Ecological Monitoring Protocols (2017).

176 Fellowes Crescent, Waterdown, ON, L0R 2H3
T: 905-689-0793 F: 905-689-9216 E: bbricker@planbnh.ca

Conclusions

This section will provide a summary of the report's key findings and recommendations for ease of reference. The report recommendations will be included in a Table that clearly outlines all elements of the mitigation strategy and will explain how each has/will be implemented as part of the proposed development. A recommendation as to whether the proposed development is consistent with the policies as outlined in Section 2.0 (Approach) and any recommended conditions of approval will also be included in this section. This section will also provide a final recommendation to approve/not approve the development proposal based on the results of the study and the demonstration that the proposal will achieve no negative impacts in accordance with Section 118(3) of the ROP.

From a formatting/administrative perspective, the following items will also be included in the EIA:

- Confirmation that the study has been completed in accordance with an approved ToR, with the ToR included as part of the appendices;
- Principal author of report, curricula vitae and firm's name;
- A list of contributing technical staff and curricula vitae;
- A list of all agencies and individuals contacted during report preparation;
- Hard copies of the EIA printed on 8.5 x 11 double sided paper and digital copies;
- Bibliography of literature cited;
- Digital GIS files used in the preparation of figures showing the RNHS, natural features and functions;
- Field data sheets; and,
- Boundary survey, which where appropriate, have been confirmed by a Municipal or Conservation Authority staff person.

Closure

The above EIA Terms of Reference has been prepared as part of a development application at 1600 Kerns Road in the City of Burlington. Given the nature of the subject property (existing commercial plaza) and the proposed re-development, a "scoped" EIA is proposed. The proposed work plan has taken into consideration the Region of Halton and Conservation Halton guidelines for the preparation of an EIA, as well as initial comments from Region of Halton and Conservation Halton staff at the November 29th site walk.

176 Fellowes Crescent, Waterdown, ON, L0R 2H3
T: 905-689-0793 F: 905-689-9216 E: bbricker@planbnh.ca

If you have any questions or concerns with our proposed EIA work plan, please do not hesitate to contact me.

Yours truly,

PLAN B Natural Heritage

Brad D. Bricker, M.Sc.
Certified Senior Ecologist (ESA)

Copy: Jennifer Lawrence — Jennifer Lawrence & Associates
Todd Cullen — Fieldgate Properties
Peter Mahovlich — Fieldgate Properties

Landscape Ecology and Natural Heritage Planning

176 Fellowes Crescent, Waterdown, ON, L0R 2H3
T: 905-689-0793 F: 905-689-9216 E: bbricker@planbnh.ca

EDUCATION

1989	M.Sc., Botany/Ecology, University of Guelph, Guelph, Ontario
1987	B.A. (Honours with Distinction), Major - Urban/Biophysical Geography, Minor - Environmental Studies, University of Guelph, Guelph, Ontario
1981	A.A. Dipl. (Communications), Mohawk College, Hamilton, Ontario

PROFESSIONAL EXPERIENCE

2009 - Present	Principal, PLAN B Natural Heritage
2002 - 2009	Manager - Natural Sciences, LGL Limited
1997 - 2002	Senior Ecologist, LGL Limited
1989 - 1997	Ecologist, Ecoplans Limited
1987 - 1993	Forest Ecologist, Williams & Associates

PROFILE

Brad Bricker received his professional certification as an Ecologist in 1993 and was re-certified as a Senior Ecologist in May 1999, August 2007, August 2012, and August 2017 by the Ecological Society of America. Brad has over 30 years experience conducting botanical research, natural heritage inventories, development opportunities/constraints analysis, environmental impact assessments, environmental monitoring programs, and habitat restoration/enhancement plans. He has managed over 750 projects and has been a key participant in numerous large-scale and small-scale projects, including subwatershed impact studies, secondary plans, environmental impact studies, environmental implementation plans, biological monitoring programs, site restoration/management plans, and environmental assessments for Provincial/Municipal Road projects. Brad has a thorough understanding of ecological principles/theories and the current natural heritage policy field. He has developed excellent working relationships with external agencies and municipal staff throughout Southern Ontario.

As a former 9-year member and Co-chair of the Halton Region Ecological and Environmental Advisory Committee (EEAC), Mr. Bricker provided technical advice to Regional Planning staff on matters relating to the protection and management of Halton's Natural Heritage resources. Through various subcommittees, he provided key input to the Regional Environmental Impact Assessment Guidelines, Official Plan Reviews and Natural Heritage Policies. Mr. Bricker has also co-authored several articles in the scientific literature on environmental management guidelines for minimizing the effects of disturbance on vegetation and promoting species conservation.

Credit Valley Conservation awarded the **"Friends of the Credit Conservation Award of Distinction"** to Brad and his former employer in 2004 for "*establishing innovative standards within the planning and development communities to evaluate and protect natural heritage features*". This award was based on the Sub-Area 1 and 3 Block Plan Environmental Implementation Report and EIS prepared for a landowner group in the City of Brampton. Brad was also the Project Ecologist for the Brantford

Waterfront Master Plan (2011) and the Yellowknife Harbour Plan (2013), which received the *Canadian Society of Landscape Architects National Merit* and *National Honour Awards*, respectively.

Brad has been qualified as an expert witness by the Ontario Municipal Board and the Niagara Escarpment Hearing Office (MOE), and has provided expert witness testimony at over 20 hearings. He has also made numerous presentations to Municipal Councils and Planning and Development Review Committees throughout Southern Ontario. Brad has also participated in numerous public workshops, design charrettes, and public meetings required under the Planning Act or the Environmental Assessment Act.

PROJECT EXPERIENCE

Master Planning Studies

Brad has acted as the Project Manager and lead Ecologist for the natural environment component of over 30 secondary plans, waterfront master plans, community plans, Official Plan reviews and watershed studies throughout Southern Ontario including:

Master Planning Study	Client	Start Date
Stockyards Secondary Plan	Township of Woolwich	2016
City of Brantford OPR (Annexed Lands)	City of Brantford	2016
6th Concession Construction	Township of Adjala	2016
Block 41 Secondary Plan	City of Vaughan	2015
LaSalle Official Plan Review	Town of LaSalle	2015
Midland Official Plan Review	Town of Midland	2015
Beaver Creek District Plan	City of Waterloo	2014
Everett Servicing Class EA	Township of Adjala	2014
Colgan Servicing Class EA	Township of Adjala	2014
City of Brantford Official Plan Review	City of Brantford	2013
Terrace Bay Waterfront Development Plan	Town of Terrace Bay	2012
Unimin Waterfront Development Plan	Town of Midland	2012
Nipigon Waterfront Master Plan	Town of Nipigon	2012
Everett Secondary Plan	Township of Adjala	2012
Breslau Secondary Plan	Township of Woolwich	2011
Barrie Waterfront Master Plan	City of Barrie	2011
Highland Creek Watershed Greening Strategy	TRCA	2011
Yellowknife Harbour Plan	City of Yellowknife	2010
North of Shellard Neighburhood Plan	City of Brantford	2010
Southwest Kitchener Community Plan	City of Kitchener	2010
Brantford Waterfront Master Plan	City of Brantford	2009
Kleinburg-Nashville Focus Area Study	City of Vaughan	2009
Little Lake Master Plan	City of Peterborough	2009
Sutton Secondary Plan	Town of Georgina	2008
SW Brantford West of Conklin Secondary Plan	City of Brantford	2007
Keswick Business Park	Town of Georgina	2006
North Hespeler Community Plan	City of Cambridge	2006
Carrville District Centre Plan	City of Vaughan	2004
Oshawa Durham College Campus Master Plan	Durham College	2002
Port Dover Waterfront Master Plan	Norfolk County	2000

Bennie Farm Secondary Plan	Leamington	2000
Ayr Community Plan	North Dumfries	1999
Hancock Neighbourhood 3CII Master Plan	Clarington	1999
Boxgrove Secondary Plan	Town of Markham	1998
Conklin West Secondary Plan	City of Oshawa	1998
Alton Community Secondary Plan	City of Burlington	1996
South Aldershot Community Secondary Plan	City of Burlington	1996
Orchard Community Secondary Plan	City of Burlington	1995

Environmental Impact Studies (EIS)

Brad has managed and completed numerous environmental impact studies for large scale and small scale urban and rural development proposals adjacent to natural heritage features, such as Provincially Significant Wetlands (PSW), woodlands, valleylands, and Environmentally Sensitive Areas (ESA). Representative EIS projects include:

Environmental Impact Study	Client	Start Date
River Glen Haven	ATK Care	2016
3280 Courtice Road	Holland Homes	2016
Waterworks Park	City of Brantford	2016
Crestwood School	Plaston Architects	2016
Courtice – Block 102	Claret Investments	2016
Barrie Military Park	Thinc Design	2016
280 King Street	Holland Homes	2016
2888 Trulls Road	Holland Homes	2016
Baird-White Severance	Claret Investments	2014
Thiele Woodlot	Claret Investments	2014
Bayfield	Bayfield Developments	2014
Glen Ridge Estates	Glen Ridge Estates	2014
Mount Hope Estates	Tim van Stralen	2013

Species at Risk Assessments

As Project Manager, Brad has been responsible for completing due diligence assessments for species at risk, as part of the development review and approval process. Overall benefit permits and compensation plans have been prepared for several species at risk protected under the *Endangered Species Act*. Brad has also prepared adaptive mitigation plans for species at risk, as part of existing licenced quarries and future extraction operations.

Species at Risk Assessments	Client	Start Date
6th Line Butternut Compensation	Worthington Homes	2016
Woodbine Avenue Peer Review	Town of Georgina	2016
Tansley Quarry	Forterra Brick	2015
Burlington Quarry	Forterra Brick	2015
Aldershot East Quarry Mitigation Plan	Forterra Brick	2014
Woolwich Street Bridge	Township of Woolwich	2014
Glover Road	Branthaven Homes	2014

Provincial and Municipal Road Projects

Brad has been a Project Manager and key participant in the terrestrial environment evaluation, impact analysis, mitigation design, site restoration, environmental monitoring, and site inspection aspects of several Environmental and Class Environmental Assessments for Provincial and Municipal Road projects in Ontario including:

- Williams Parkway Extension (Sub-Area 1 and 3 Block Plan EIR), City of Brampton.
- Highway 404 Widening, MTO.
- Highway 11 Widening - South of Temagami, MTO
- Highway 11 Widening – Emsdale to Burk's Falls, MTO
- Reconstruction of Winston Churchill Boulevard, Class Environmental Assessment, Regional Municipality of Peel.
- Upper Middle Road Bridge, 16 Mile Creek Valley ESA, Town of Oakville.
- Neyagawa Boulevard, Shannon's Creek Crossing, 16 Mile Creek Valley ESA, Town of Oakville.
- Highway 410 Extension - Bovaird Drive to Highway 10, Environmental Assessment/Natural Environment Update, Ministry of Transportation.
- Ford Drive Extension: Cornwall Road to Lakeshore Road East - Class Environmental Assessment, Town of Oakville.
- Bell School Line Reconstruction, Town of Milton.
- Guelph Line Improvements: North of Derry Road, Region of Halton.
- Ainslie Street Extension, City of Cambridge.
- Mississauga Transitway Planning Study: Mavis Road to Cawthra Road - Environmental Assessment, City of Mississauga.
- Orangeville South Arterial and Hansen Boulevard Class Environmental Assessment, Town of Orangeville.
- Highway 7 - Kitchener to Guelph, Environmental Assessment, Ministry of Transportation.
- Highway 416 - Century Road to Highway 43, Class Environmental Assessment, Ministry of Transportation.
- Bayview Avenue - Stouffville Road to Bloomington Road, Environmental Assessment, Regional Municipality of York.
- Main Street South - Maple Street to 10th Sideroad, Georgetown, Class Environmental Assessment, Town of Halton Hills.

Landfill Impact Assessment & Monitoring

Project manager and key participant in the completion of environmental impact assessments and monitoring programs for the following landfill sites:

- Essex County Landfill Site No. 3, On-site Woodlot Monitoring Program for Landfill-Related Impacts. Essex-Windsor Solid Waste Authority.
- Sarnia Landfill, Wetland Monitoring Program and Impact Assessment. County of Lambton/Conestoga-Rovers & Associates.
- Keele Valley Landfill - Biophysical/Cultural Resource Impact Assessment: Proposed Interim Expansion. Metropolitan Toronto Solid Waste Management Division/Conestoga-Rovers & Associates.

- Green Lane Landfill - Preliminary Environmental Assessment and Woodlot/Benthic Monitoring Program: Proposed Interim Expansion. St. Thomas Sanitary Collection Services Ltd./Conestoga-Rovers & Associates.

Hydrocarbon Pipelines

Brad completed the biological inventory, impact assessment and mitigation design for the following pipeline:

- Dawn to Enniskillen, Enniskillen to Brooke, and Brooke to Strathroy - Route Selection and Environmental Assessment, Union Gas Ltd.

Aggregate Resource Assessments

Brad has completed the environmental inventory and impact assessment for proposed and existing licensed aggregate extraction sites including:

- Aldershot East Quarry - Species at Risk Inventory, Forterra Brick
- Burlington Quarry - EIA, Forterra Brick
- Comprehensive Broad Scale Environmental Study – Resource Area 9A, Town of Caledon, James Dick Construction.
- Armbro-Pinchin Sand and Gravel Pit - Environmental Assessment, Armbro Materials and Construction Ltd.
- Harnden and King Pit - Environmental Analysis, Harnden and King Construction Ltd.

Watershed Plans and Subwatershed Impact Studies

Responsible for the project management, environmental inventory, constraint analysis, impact evaluation and resource management guideline preparation for several subwatershed studies including:

- Sheldon Creek Subwatershed Impact Study, Alton and Orchard Community Secondary Plans, City of Burlington.
- Fourteen Mile, McCraney, Taplow Creeks Subwatershed Impact Study, Town of Oakville.
- Glen Oaks Creek Subwatershed Impact Management Study, Town of Oakville.
- Sheldon Creek Watershed Master Plan, City of Burlington.

Large-Scale Natural Heritage Planning and Resource Management Studies

Environmental Study - Lands North of Highway 5, Town of Oakville, 1998-1999

Mr. Bricker was the Project Manager for a Natural Heritage inventory of a 4,000 ha parcel of land located north of Highway 5 in the Town of Oakville. The purpose of the study was to develop a defensible and implementable environmental protection framework that would form the basis for subsequent Secondary Plan and Subwatershed level studies, and that would ensure environmentally sustainable urban development. A comprehensive field inventory program encompassing vegetation, forestry, wildlife and fisheries was completed to determine the ecological attributes, functions and linkages within the study area and the larger regional landscape setting. Based on the results of the surveys, natural features were ranked in terms of their priority for environmental protection. Areas suitable for integration into the urban fabric as well as areas that did not pose a constraint to future development were also identified.

Environmental management recommendations and mitigation strategies were developed to ensure environmentally sustainable urban growth. A key element of the study was to review and select appropriate planning mechanisms and strategies for implementing the recommended Natural Heritage Framework.

Box Grove Community Secondary Plan, Town of Markham, 1998-2000

A Secondary Plan and Environmental Master Drainage Plan was completed for a 750 acre parcel of land located within the Rouge River Watershed. As Project Manager for the environmental component of the study, Mr. Bricker was responsible for identifying the opportunities/constraints to development and establishing a framework for the development of land use concept plans. A key focus of the study was to develop a land use concept plan that retained and enhanced the natural heritage features within the Box Grove Community and the larger Rouge River watershed.

Area Training Centre (ATC) Meaford, Manoeuvre Area Planning System (MAPS), Department of National Defence, 1998-1999

A Manoeuvre Area Planning System (MAPS) was prepared for the Department of National Defence (DND) consisting of a Natural Resource Management Plan, Natural Resource Inventory and Environmental Assessment for the 7,000 ha ATC at Meaford, Ontario. Brad's involvement in this study included: development of the vegetation inventory methodology, completion of detailed community level and floristic surveys (30 field days), observation and documentation of military training activities and environmental effects, impact analysis and preparation of a Vegetation Management Strategy to facilitate sustainable training area use based on the principles of ecosystem management.

South Guelph Secondary Plan Area Scoped EIS, City of Guelph, 1997-1998

Project Manager for completion of a Scoped EIS for a several hundred ha study area in the South Guelph Secondary Plan Area. The purpose of the study was to create an "environmental framework" for the preparation of industrial land use concept plans, in consultation with the Grand River Conservation Authority, City of Guelph Environmental Advisory Committee and public interest groups. The results of detailed biological inventories and surveyed natural heritage features were incorporated into a GIS database to identify opportunities/constraints for development. A key aspect of the study was to identify core natural area boundaries and a linkage enhancement zone between the Mill Creek and Hanlon Creek Watersheds. Environmental management guidelines and mitigation measures to protect key natural features were also provided as part of the study.

Orchard Community Secondary Plan and Sheldon Creek Subwatershed Impact Study, City of Burlington, 1995-1996

Project Manager (Natural Environment) for the completion of a Secondary Plan and Subwatershed Impact Study for a 275 ha study area located adjacent to the Bronte Creek Valley ESA. Key study elements included the inventory and functional evaluation of terrestrial/aquatic habitat features, identification of environmental design constants for preparation of land use concept plans, and development of environmental management recommendations and implementation guidelines for plans of subdivisions.

Environmental Monitoring Programs

Brad has been responsible for the development and completion of short-term and long-term environmental monitoring programs designed to evaluate the effects of landfill activities, residential developments and timber management activities on the health, species composition/abundance and growth rate of forest and wetland vegetation. Brad's project experience includes:

- Essex County Landfill Site No. 3, On-site Woodlot Monitoring Program for Landfill-Related Impacts, 1990-1995. Essex-Windsor Solid Waste Authority.
- Southcreek Subdivision, Hanlon Creek Swamp Wetland (PSW), City of Guelph, 1997 to 2008, Southcreek Developments.
- Pine Ridge Subdivision, Torrance Creek Wetland (PSW), City of Guelph, 1993 to 2008, Thomasfield Homes.
- Sarnia Landfill Wetland - 1993 to 2011, County of Lambton.
- Niagara Escarpment Woodlot Management Pilot Project, 1987-1993, Niagara Escarpment Commission and Ontario Heritage Foundation.

Environmental Implementation Studies and Wetland/Woodland Resource Management Plans

Project Manager for several Environmental Implementation Studies, demonstrating how Draft Approved plans of residential subdivisions comply with the resource protection targets of watershed/subwatershed plans (e.g. Hanlon Creek, Sheldon Creek). The key elements of these studies included environmental impact analysis, specification of vegetation, wildlife and aquatic resource protection/enhancement measures, preparation of tree inventory and protection plans, and development of long-term biological monitoring programs.

- Sub-Area 1, 3 and 5 Block Plans and Environmental Implementation Reports, City of Brampton.
- Clairfields Subdivision, City of Guelph, Victoria Wood Ltd.
- Pine Ridge Subdivision, City of Guelph, Ariss Glen Developments.
- Southcreek Community, City of Guelph, Southcreek Developments.
- Orchard Community Subdivisions, City of Burlington, Mattamy Homes Ltd./Metrontario Group.

Urban-Rural Environmental Resource Assessments

During his 30 years as an Ecologist, Brad has completed numerous botanical surveys, wildlife habitat assessments, wetland evaluations, arborist reports and tree saving/management plans for development applications throughout Southern Ontario.

PROFESSIONAL ASSOCIATIONS & CERTIFICATIONS

- Member, Ecological Society of America
- Certified Senior Ecologist, Ecological Society of America

WEBSITE

www.planbnh.ca

PUBLICATIONS & POSTERS

2010 Bricker, B.D., Duckett, F., Hinde, D., Leinster, D. and Givens, T. Waterfront master planning as a tool to protect and restore river ecosystems in an urban context. A poster presented at the 53rd. Conference of the International Association of Great Lakes Research.

1999 Goodban, A.G., Bakowsky, W.D. and Bricker, B.D. The historical and present extent and floristic composition of prairie and savanna vegetation in the vicinity of Hamilton, Ontario. In: Proceedings of the 15th North American Prairie Conference. *Edited by* C. Warwick. Natural Areas Association, Bend, Oregon.

1998 Banks, W.D., Bricker, B.D. and Sims, C.R. Stormwater and groundwater management within a watershed context. Proceedings of the Groundwater in a Watershed Context Symposium, Canada Centre for Inland Waters, Burlington, ON, Canada, Dec 2-4 1998.

1995 Reader, R.J., Bonser, S.P., Duralia, T.E. and Bricker, B.D. Interspecific variation in tree seedling establishment in canopy gaps in relation to tree density. Journal of Vegetation Science 6: 609-614.

1994 Reader, R.J. and Bricker, B.D. Barriers to establishment of invading, non-forest plants in deciduous forest nature reserves. Environmental Conservation 21: 62-66.

1993 Williams, P.A. and Bricker, B.D. Niagara Escarpment Woodlot Management Pilot Project. Final Report to the Niagara Escarpment Commission and the Ontario Heritage Foundation.

1992 Reader, R.J. and Bricker, B.D. Value of selectively cut deciduous forest for understorey herb conservation: An experimental assessment. Forest Ecology & Management 51: 317-327.

1992 Reader, R.J. and Bricker, B.D. Response of five deciduous forest herbs to partial canopy removal and patch size. American Midland Naturalist 127: 149-157.

1990 Bricker B.D. and Reader, R.J. The effect of woodlot size on woody species composition and richness. p. 75-87 In G.M. Allen, P.F.J. Eagles and S.D. Price (eds.), Conserving Carolinian Canada: Conservation Biology in the Deciduous Forest Region, University of Waterloo Press, Waterloo, Ont. 346 p.

1989 Bricker, B.D. Response of herb guilds to canopy removal in deciduous forests. M.Sc. Thesis, University of Guelph. 85 p.

TYLER HOAR, B.Sc.
Senior Wildlife Biologist/ELC Specialist

EDUCATION

1996	B.Sc., Ecology & Aquatic Biology, University of Guelph, Guelph, Ontario

PROFESSIONAL EXPERIENCE

2009-present	Senior Wildlife Biologist/ELC Specialist, PLAN B Natural Heritage
2006-2009	Canadian Wildlife Service - Long-Term Forest Bird Breeding Survey
2002-2008	Ducks Unlimited - Migratory Fish Monitoring at Oshawa Second Marsh Weir
2001-2006	Canadian Wildlife Service - The Second Ontario Breeding Bird Atlas Researcher
2000-2008	Canadian Wildlife Service – Little Gull Migration Monitoring Program
1996-present	Royal Ontario Museum - Ornithology Collection Assistant

PROFILE

Tyler Hoar is a senior wildlife biologist with expertise in the field of ornithology. He has over 15 years of experience conducting field inventories and research throughout Ontario and North America. He was a key field researcher for the Second Edition of the Ontario Breeding Bird Atlas, and was responsible for collecting data related to the species distribution and abundance of birds in Durham Region, Central Ontario and the James Bay coast.

Tyler has also completed bird surveys and amphibian monitoring in the Rouge River watershed, as well as long-term monitoring of forest birds near Apsley, Ontario on behalf of the Canadian Wildlife Service. He is very familiar with the standard protocols used to document the distribution and abundance of birds, amphibians, fish and mammals in the Province of Ontario. Tyler recently received his certification in the Ecological Land Classification (ELC) system used to classify and describe vegetation communities in Ontario. Through this unique combination of skills, Tyler has developed a thorough understanding of the inter-relationships between habitat conditions and wildlife utilization. Tyler has co-authored a number of reports and publications, and continues to be actively involved with the Ornithology Department at the Royal Ontario Museum. He has also participated in numerous research projects for various government agencies related to the conservation of shorebirds, waterfowl, raptors and forest-interior birds. Tyler is currently extracting and analyzing data from Project Nest Watch and the Ontario Nest Records Scheme in support of a new study on the status of the Bank Swallow in Ontario for the Canada Wildlife Service.

Tyler has completed fish habitat assessments for several projects, including development applications, servicing corridor class environmental assessments, and as part of secondary and neighbourhood scale planning studies. He also conducts species-at-risk surveys and has contributed to the preparation of habitat compensation plans.

PROJECT EXPERIENCE

Natural Heritage Evaluations & Impact Studies

- Barrie Military Park, City of Barrie
- Everett Class EA Municipal Servicing Study, Township of Adjala-Tosorontio
- Everett Secondary Plan, Township of Adjala-Tosorontio
- City of Brantford Official Plan Review, City of Brantford
- Waterworks Park, City of Brantford
- Brantford Waterfront Master Plan, City of Brantford
- North of Shellard Neighbourhood Plan, City of Brantford
- Breslau Secondary Plan, Township of Woolwich
- Lynden Park Mall Expansion EIS, Ivanhoe Cambridge
- Breslau Community Plan, Thomasfield Homes
- Southwest Georgetown Natural Heritage Inventory and Analysis, SW Georgetown Landowner Group
- Hancock Neighborhood Phase IIA Servicing Corridor (Courtice), Claret Investments

PUBLICATIONS

Hoar, T.L., K. De Smet and W. Campbell. Birds of Canada. Lone Pine Publishing. 526p.

Hoar, T. 2009. The Collection of Fresh Avian Specimens for Avian Influenza Testing – Late Autumn 2008. Report to Canada Wildlife Service.

Peck, M.K., T. Hoar, and C. Wegenschimmel. 2008. Earliest Egg and Latest Young Dates for Ontario Breeding Birds Extracted for Canada Wildlife Service Report from the Ontario Nest Records Scheme 1956 to 2006.

Joos, R., D.V.C. Weseloh, and T. Hoar. 2005. Little Gull (*Larus minutus*) migration on the Great Lakes: Do population numbers and behavioral differentiate stopover from staging sites? Unpubl. Manuscript.

Richards, J. and Hoar, T. 2003. A Birder's Guide to Second Marsh Wildlife Area, McLaughlin Bay Wildlife Reserve and Surroundings Update. Ontario Birds 21(3):140-144

JEREMY J. JACKSON, B.Sc.
Associate, ISA Certified Arborist & GIS Specialist

EDUCATION

2004 Honors Bachelor of Science, Double Major in Environmental Science and Geographic Information Systems, University of Toronto, Mississauga, Ontario

PROFESSIONAL EXPERIENCE

2009 to present	Associate, Certified Arborist and GIS Specialist, PLAN B Natural Heritage
2005-2009	Certified Arborist and GIS Specialist, LGL Limited
2003-2005	Naturalization Crew Leader and Geomorphology/Water Resources Assistant, Credit Valley Conservation

PROFILE

Jeremy Jackson is an ISA Certified Arborist with extensive experience completing all aspects of Tree Inventory and Preservation Plans for development applications, Edge Management Plans, Emerald Ash Borer Assessment, Vegetation Conservation Plans, Landscape Tree Certification, Tree Risk Assessment, Woodlot Assessments with respect to Regional by-laws, Woodlot by-law Infraction Assessment, Tree Valuations, Butternut Health Assessments in accordance with MNR protocol and peer review of previous arborological studies. In additional to receiving an Arborist Certification Mr. Jackson has also received a Tree Risk Assessment Qualification from the ISA and has been designated as a Certified Butternut Assessor (#248) by the Ministry of the Natural Resources. Jeremy has completed many Butternut Assessments and has assessed over 200 Butternut Trees for Municipal and private landowners.

As a Geographic Information Systems Analyst, Mr. Jackson has completed natural heritage mapping for Official Plan Reviews, Waterfront Master Plans and Municipal Secondary Plans. He has gained extensive experience with AutoCAD and the full range of GIS software applications, including ArcGIS, Autodesk Map 3D, MapInfo, ArcInfo/ArcView, Grass, and Idrisi. He has also determined the urban forest canopy cover of local municipalities in conjunction with Urban Forest Management Plans. Other mapping roles include Forest Management Plans, Environmental Impact Assessments, Restoration and Planting Plans, and Tree Preservation Plans. Jeremy has a well-rounded background in the natural sciences, which enables him to effectively and accurately translate field data into a GIS mapping product. These GIS skills are regularly applied to his Arborist related projects. As part of large infrastructure project for the City of Toronto, Jeremy determined the most suitable routes for feeder mains based on an analysis of tree cover density and tree species sensitivity to construction.

PROFESSIONAL ACCREDITATION

2006 Certified Arborist #ON-1089A, International Society of Arboriculture (ISA)

2010 Tree Risk Assessment Qualification (TRAQ), International Society of Arboriculture (ISA)

2010 Certified Butternut Health Assessor #248, MNR

PROJECT EXPERIENCE

Official Plan Reviews (GIS)

- Town of New Tecumseth
- Town of LaSalle
- Town of Midland
- City of Brantford
- City of Brantford – Annexed Lands

Natural Heritage Studies (GIS)

- Downtown Georgetown Secondary Plan, Town of Halton Hills
- Stockyards Secondary Plan, Township of Woolwich
- Block 41 Secondary Plan, City of Vaughan
- Breslau Secondary Plan, Township of Woolwich
- Colgan Master Servicing Plan, Township of Adjala-Tosorontio
- Everett Community Servicing Study, Township of Adjala-Tosorontio
- Brantford Waterfront Master Plan, City of Brantford
- North of Shellard Neighbourhood and Recreation Plan, City of Brantford
- Everett Secondary Plan, Township of Adjala-Tosorontio
- Sutton Secondary Plan, Town of Georgina
- Keswick Business Park, Town of Georgina
- Kleinberg-Nashville Focus Area Study, City of Vaughan
- Southwest Georgetown Phase 1 and Phase 2, Southwest Georgetown Landowner Group
- Milton - Phase 3, Mattamy Homes

Arborist Reports and Tree Saving Plans

- Avenue Road Feedermain, City of Toronto
- Aurora 2C Lands, Aurora 2C Landowner Group
- Hancock Neighborhood Phase IIA Servicing Easement, Claret Investments
- Beeton Meadows – Phase1 and Phase 2, Sorbara Development Group
- Waterdown Bay Subdivision, Phase 1B, Waterdown Bay Inc.
- F.J. Horgan Water Treatment Plant Expansion, City of Toronto
- St. Ignatius of Loyola, Halton Catholic District School Board

Environmental Impact Studies

- Mount Hope Estates (Palgrave), Sunshine Developments
- Breslau Community Plan, Thomasfield Homes
- Halton Hills Subdivision, Esquesing Developments
- Brownridge Phase 16, Mattamy Homes
- Featherstone Property, Mattamy Homes

Anthony G. Goodban, B.Sc., M.E.S.(Pl.), MCIP, RPP
Goodban Ecological Consulting Inc. (GEC)
879 Cabot Trail, Milton, ON L9T 3W4
Phone: (905) 693-9064
E-mail: anthony.goodban@sympatico.ca

Mr. Anthony Goodban's academic background is in botany, ecology and environmental planning at the undergraduate and graduate level and he has 29 years of professional field experience. He has expert knowledge of the vegetation, flora and wildlife of southern Ontario. Mr. Goodban has been the principal of Goodban Ecological Consulting Inc. since 1999 and he works either as an independent consultant or as a subconsultant to other firms. Past and present clients include other consulting firms, aggregate companies, developers, municipalities, conservation authorities, provincial ministries, naturalist clubs and private citizens. Mr. Goodban has worked on a broad variety of projects involving species at risk, including many different plant and wildlife species. He often undertakes detailed field ecological field surveys for a wide range of projects, including Official Plan updates, aggregate applications, land development projects, park planning exercises, natural areas inventories, restoration and monitoring projects. Mr. Goodban has worked on many wetland projects, including wetland evaluations, boundary delineations, impact assessments and monitoring programs. He provides project input relating to planning matters such as the natural heritage components of the Provincial Policy Statement, Greenbelt Plan and the Endangered Species Act, and has prepared numerous environmental impact statements for a wide variety of development proposals. He has expertise dealing with rare vegetation communities, including alvars and prairies, and has written several papers and reports on prairie and savanna vegetation in southern Ontario. He is certified to complete wetland evaluations under the *Ontario Wetland Evaluation System: Southern Manual (3rd Edition)* and to use the *Ecological Land Classification System for Southern Ontario* (ELC). Mr. Goodban has appeared as an expert witness before the Ontario Municipal Board and the Joint Board.

EDUCATION

M.E.S.(Planning)	Environmental Planning, York University, 1995
B.Sc.	Honours Ecology, University of Guelph, 1992

PROFESSIONAL ASSOCIATIONS

Ontario Professional Planners Institute - Full Member/Registered Professional Planner (RPP)
Canadian Institute of Planners - Full Member (MCIP)

OTHER TRAINING

- 3-day *Ontario Reptile & Amphibian Field Survey Course* presented by Blazing Star Environmental, NRSI, Ontario Ministry of Natural Resources and Forestry (MNRF). 2017
- RX-100 Low Complexity Prescribed Burn (LCPB) Worker Course, 2014
- Ontario Tree Seed Collector Training Course, 2013
- MNR Butternut Health Assessment "Refresher" Training, 2013
- MNR Butternut Health Assessment Training, 2009
- MNR Ecological Land Classification System (ELC) training course, 2008
- MNR Ontario Wetland Evaluation System, 1994

EMPLOYMENT HISTORY

1999-Present	Consulting Ecologist/Environmental Planner, Goodban Ecological Consulting Inc.
1992-1998	Ecologist and Natural Heritage Planner, Ecoplans Limited
1991-1992	Botanist and Ecologist, Hamilton-Wentworth Natural Areas Inventory Project
1990	Field Botanist, Hamilton Region Conservation Authority and Hamilton Naturalists' Club

PROFILE OF PROFESSIONAL ACTIVITIES

Species at Risk (SAR)

- Mr. Goodban has worked on many projects involving species at risk (SAR) in recent years. Projects dealing with wildlife species include Mottled Duskywing butterfly, Jefferson Salamander, Northern Dusky Salamander, Allegheny Mountain Dusky Salamander, Blanding's Turtle, Butler's Gartersnake, Eastern Foxsnake, Gray Ratsnake, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift and Eastern Meadowlark. Projects dealing with plant species include American Chestnut, American Columbo, American Ginseng, Butternut, Flowering Dogwood and Kentucky Coffee-tree.
- Mr. Goodban has prepared a number of SAR Mitigation Plans for projects covered under Ontario Regulation 242/08, including drainage works, pits and quarries, etc.
- Mr. Goodban has completed a series of detailed studies of the Endangered Jefferson Salamander and its habitats. Work has included detailed monitoring of six breeding pools from 2004 to the present (including frog call surveys, egg mass surveys, fixed-point photography, water temperature, vegetation, etc), egg mass surveys of 30+ breeding pools in Halton, Hamilton, Peel, Waterloo and Wellington, spring migration studies with drift fencing and pitfall traps, minnow trapping and larval surveys in breeding pools, etc. In 2014, Mr. Goodban began monitoring almost 1 km of drift fence and 60+ pitfall traps set up to capture salamanders migrating to breeding pools in the early spring.
- Mr. Goodban is a certified Ontario Butternut Health Assessor (BHA) who has completed many Butternut Health Assessments in recent years. Mr. Goodban has also overseen compensatory Butternut planting programs required by *Endangered Species Act* Stewardship Agreements and through the registry process allowed under O.Reg 242/08.

Vegetation and Flora

- Mr. Goodban is an expert field botanist and ecologist certified to use the *Ecological Land Classification System for Southern Ontario* (ELC). He has completed detailed botanical inventories of more than 200 sites in southern Ontario.
- Mr. Goodban was a consulting botanist/ecologist to several natural areas inventory projects in southern Ontario, including Hamilton (1990-1992; 2001-2002; 2010-2014), Halton (2003-2004) and Niagara (2006-2008).
- Mr. Goodban is the author of the flora or plant checklist for the City of Hamilton, which has been published in various editions since the early 1990's and the current 2014 edition documents close to 1500 vascular plant taxa from the Hamilton area.
- Mr. Goodban has expertise dealing with rare vegetation communities in Ontario, including alvars and prairies, and has written several papers and reports on alvar, prairie and savanna vegetation in southern Ontario.
- Since 1992, Mr. Goodban has worked on many wetland projects, including wetland evaluations, boundary delineations, impact assessments and monitoring programs. He is certified to complete wetland evaluations under the *Ontario Wetland Evaluation System: Southern Manual (3rd Edition).*

SELECTED PUBLICATIONS

- Goodban, A.G. 2014. The Vascular Plants of Hamilton, Ontario. pp. 1 to 91, In: Schwetz, N. (ed.), Hamilton Natural Areas Inventory Project 3rd Edition, Nature Counts 2, Species Checklist Document. Hamilton Conservation Authority, Ancaster, Ontario.
- Goodban, A.G. 2014. The Vegetation Communities of Hamilton, Ontario. pp. 92 to 111, In: Schwetz, N. (ed.), Hamilton Natural Areas Inventory Project 3rd Edition, Nature Counts 2, Species Checklist Document. Hamilton Conservation Authority, Ancaster, Ontario.
- Goodban, A.G. and A.C. Garofalo. 2010. Rare Vegetation Types of the Niagara Region, Ontario: A Preliminary Checklist. Chapter 7 In: Natural Areas Inventory 2006-2009 – Niagara Peninsula Conservation Authority Watershed, Volume 1. Niagara Peninsula Conservation Authority, Welland, Ontario.
- Goodban, A.G., W.D. Bakowsky and B.D. Bricker. 1999. The historical and present extent and floristic composition of prairie and savanna vegetation in the vicinity of Hamilton, Ontario. pp. 87-103. In: Proceedings of the 15th North American Prairie Conference. *Edited by* C. Warwick. Natural Areas Association, Bend, Oregon.

Jennifer Lawrence, MCIP, RPP

8 Fieldgate Street, Dundas, ON L9H 6M6
(p) 289-442-2829 (e) jennifer@jlplanning.ca (w) www.jlplanning.ca

Education

Bachelor of Environmental Studies (BES), Honours Environment and Resource Studies
University of Waterloo
1994

Professional Designations

Ontario Professional Planners Institute and Canadian Institute of Planners (MCIP, RPP)

Professional Background

July 2013 – Present
President
Jennifer Lawrence and Associates Inc.

2007-2013
Manager, Environmental Planning
Conservation Halton

2002-2007
Coordinator, Environmental Planning
Conservation Halton

1995-2002
Environmental Planner
Conservation Halton

1993 and 1995 (contract)
Planning Technician,
Plan Administration
Niagara Escarpment Commission

Professional Experience

Jennifer has over twenty five years of experience in the environmental planning field. Jennifer's knowledge of environmental planning legislation coupled with her unique understanding of the complex inter-relationships between land use planning, ecology, engineering, hydrology and urban design allows Jennifer to bring dynamic and creative problem-solving skills to every project. Jennifer's philosophy is to work collaboratively with stakeholders to build understanding as well as consensus and that, in doing so, viable and workable solutions to land use planning proposals can be identified that will benefit all aspects of the community. It is on this philosophy that Jennifer founded Jennifer Lawrence and Associates Inc. in 2013.

President
Jennifer Lawrence and Associates Inc.
Dundas, Ontario
July 2013 – present

- Specializing in environmental planning, policy creation and project management
- All types of land use planning proposals including Watershed and Subwatershed Studies, Subwatershed Impact Studies/Environmental Implementation Reports, Official Plan Amendments, Zoning By-Law Amendments, Draft Plans of Subdivision, Master Plans
- Public Sector projects include: Natural Heritage Strategies for municipalities; Watershed and Subwatershed Studies for conservation authorities and municipalities, decision-making frameworks for Provincial Ministries; on-demand planning services for Provincial agencies; research projects for Federal Ministries; and, review of Environmental Implementation Reports, Official Plan Amendments, Zoning By-law Amendments and representation at the Ontario Municipal Board
- Private sector projects include: providing strategic advice and coordination on complex projects involving multi-disciplinary teams to ensure effective communication and understanding of environmental policy and regulatory requirements; and, assisting private landowners through the environmental planning and regulatory approvals process

Hamilton Harbour Remedial Action Plan Stakeholder and Public Forum Facilitator (2019-2020)

Jennifer Lawrence and Associates Inc. was retained to facilitate three Stakeholder and Public Forums for the Hamilton Harbour Remedial Action Plan. The forums brought together RAP stakeholder partners and the public to review and discuss proposed designation and criteria changes to the Beneficial Use Impairments identified in the RAP.

Nottawasaga Valley Conservation Authority Integrated Watershed Management Plan (2018-2019)

Jennifer Lawrence and Associates Inc., in collaboration with Ecosystem Recovery Inc., North-South Environmental and Arcadis, were retained by the NVCA to prepare an Integrated Watershed Management Plan. Through watershed characterization and stakeholder engagement, management strategies were developed related to: water quality and quantity; natural hazard management; biodiversity; sustainable economic and recreation opportunities; and, a greater ability for the watershed to adapt to the impacts of climate change, urbanization and other stressors. Jennifer was responsible for agency and stakeholder consultation, policy and legislation review and report writing.

Tremaine and Dundas Secondary Plan Subwatershed Study Update, City of Burlington (2016-2018)

Jennifer Lawrence and Associates Inc., in collaboration with Urbantech Consulting, Beacon Environmental, GeoProcess Research and AMEC FW, were asked by the City of Burlington to update the 2009 Subwatershed Study to address changes in planning policy at the Provincial, Regional and local level. Jennifer was responsible for project management, report writing and liaising with approval agencies to prepare the update.

Black Creek Subwatershed Study, Phase 3, Implementation, Management and Monitoring Plan, Credit Valley Conservation (2016-2018)

Jennifer Lawrence and Associates Inc., in collaboration with Ecosystem Recovery Inc., was retained by the CVC to create the final phase of the Black Creek Subwatershed Study to develop an Implementation, Management and Monitoring Plan. Jennifer was responsible for the implementation component including a policy and legislation review and analysis to recommend appropriate tools to implement the management recommendations. Jennifer was also responsible for stakeholder consultation.

Natural Heritage Services on an Emergent Basis, Metrolinx (2013-2018)

Jennifer Lawrence and Associates Inc., as part of a team led by Dougan and Associates, were retained by Metrolinx to provide consultation services and technical advice regarding natural heritage features for various construction projects. Jennifer's role related to Environmental/Land Use Planning services.

Vendor of Record for Natural Heritage Services, Infrastructure Ontario (2015-2018; 2020-present)

Jennifer Lawrence and Associates Inc., as part of a team led by Dougan and Associates, were retained by Infrastructure Ontario to provide natural heritage consulting services. As the team's land use / environmental planner, Jennifer's role related to public and agency consultation and providing natural heritage and land use planning advice.

Peer Review of Environmental Impact Statements, County of Elgin (2015-2018)

Jennifer Lawrence and Associates Inc., as part of a team led by Dougan and Associates, were retained by the County of Elgin to provide peer review of Environmental Impact Studies, submitted to the County in support of *Planning Act* applications. Jennifer's role on the team was to provide input into the Terms of Reference or Issues Scoping Reports to identify those Provincial and Municipal natural heritage policies that must be addressed in the applicant's study and to provide peer review advice as to whether the study addresses the required policies.

Landscapes of Southern Ontario: Summary of Southern Coastal Plain, Canadian Wildlife Service, Environment Canada (2015 - 2016)

Jennifer Lawrence and Associates Inc. was retained by the Canadian Wildlife Service to research and summarize the agencies, organizations, projects and programs addressing the protection and conservation of species and habitats. The database is intended to be used by Environment Canada to inform federal funding programs.

Fully Accounting for Canada's Conservation Lands: Systematic Conservation Plans in Ontario, Canadian Wildlife Service, Environment Canada (2014-2015)

Jennifer Lawrence and Associates Inc. was retained by the Canadian Wildlife Service to develop a database and complementary report documenting all Systematic Conservation Plans in Ontario. The database is intended to be used by Environment Canada to inform the National Conservation Plan.

Environmental Flow Regime Decision-Making Framework, Ministry of Natural Resources (2014-2015)

Jennifer Lawrence and Associates Inc., in collaboration with Matrix Solutions, Parish Geomorphic and Dr. Andrea Bradford, was retained by the MNR, to develop a Guide for Environmental Flow Regime in Ontario. Jennifer was responsible for creating the decision-making framework component of the guide which focuses on incorporating environmental flows into the water quantity decision-making process in southern Ontario. Jennifer organized and facilitated several meetings across southern and south-central Ontario to gather input from municipalities, conservation authorities, consultants and non-profit organizations involved in water quantity decision-making.

Natural Heritage Implementation Strategy, Municipality of Chatham-Kent (2013-2014)

Jennifer Lawrence and Associates Inc. was retained to prepare a Forest Conservation Policy in response to Council's request to investigate an alternative to a tree cutting by-law. Discussions with municipal and Conservation Authority staff, non-profit organizations and Jennifer's previous experience, resulted in the policy evolving into a more comprehensive Natural Heritage Implementation Strategy. The creation of the strategy involved collaborating with agency and non-profit staff to develop implementation actions that will enable the agencies to protect and enhance natural heritage features within the community.

Milton Heights Community Engagement, Conservation Halton (2013-2014)

Jennifer Lawrence and Associates Inc. was retained by Conservation Halton to represent their interests in an Ontario Municipal Board hearing and associated mediation. Jennifer identified the need to engage the local community to provide them an opportunity to share their concerns as well as to assist the community in gaining a better understanding of the natural heritage decisions that the public agencies made during the OMB mediation sessions. Jennifer organized a community meeting with the objective of building trust and improving communication between Conservation Halton and the Milton Heights community.

Environmental Implementation Reports / Functional Servicing Studies and Subwatershed Impact Studies (on-going)

Jennifer Lawrence and Associates Inc. is involved in the preparation, coordination and presentation of numerous Environmental Implementation Reports / Functional Servicing Studies and Subwatershed Impact Studies, prepared on behalf of private developers for large-scale subdivision applications in Burlington, Oakville, Milton and Mississauga. These studies provide a characterization of existing and proposed land use conditions, natural heritage and natural hazard impacts, management recommendations and monitoring requirements.

Additional Experience

Manager, Environmental Planning
Watershed Management Services
Halton Region Conservation Authority (Conservation Halton)
Burlington, Ontario
August 2007 to June 2013

Responsible and accountable for plan review, peer review for municipal partners, file administration and correspondence for Official Plan Amendments, Zoning By-Law Amendments, Niagara Escarpment Plan Amendments, Parkway Belt West Plan Amendments, Plans of Subdivision / Condominiums, Secondary Plans, Watershed / Subwatershed Studies and Environmental Assessments. Responsible for providing evidence at Ontario Municipal Board, Joint Board and Mining and Land Commissioner Hearings. Responsibilities also included:

- Supervision, training, development and performance reviews of 7 staff including Environmental Planners and Planning Technicians assigned to the Plan Input and Review Program and Watershed Permit Analyst assigned to the Permit Review Program;
- Coordination of Plan Input and Plan Review

with staff in Watershed Engineering Services and Watershed Planning Services;
- Reviewing and updating Conservation Halton's planning policies as they pertain to Conservation Halton's role in plan input and review as well as reviewing and updating Conservation Halton's regulatory policies related to Ontario Regulation 162/06 under Section 28 of the *Conservation Authorities Act*;
- Preparing reports and presenting to Conservation Halton's Board of Directors; and
- Reviewing and participating in inter-agency advisory committees involving municipal, regional, conservation authority and provincial representatives.

Coordinator, Environmental Planning, Watershed Management Services
Halton Region Conservation Authority (Conservation Halton)
Burlington, Ontario
April 2002 to August 2007

Environmental Planner, Watershed Management Services
Halton Region Conservation Authority (Conservation Halton)
Burlington, Ontario
October 1995 to April 2002

Planning Technician, Plan Administration
Niagara Escarpment Commission
Georgetown, Ontario
June to September 1995 and May to September 1993

Ontario Municipal Board Hearings and Mediation

Vail v. Town of Oakville - OMB File: Z010039

Central Milton Holdings Limited and 665497 Ontario Ltd v. Region of Halton, NEC, Town of Milton and Halton Region Conservation Authority - Joint Board File: 99-036

599 Lyons Lane v. Town of Oakville and Conservation Halton - OMB File: PLO80691

Milton Heights Landowners Group v. Town of Milton, Region of Halton and Conservation Halton - OMB File: PL101316

Waterdown Bay v. City of Hamilton and Conservation Halton - OMB File: PLO61186

City of Hamilton v. Various appellants
OMB File: PL090114

Professional Courses

AODA Accessible Customer Service Regulation E-Training (2016)
Public Health and Planning 101 (2016)
Excel Thru Learning (2012)
Management/Leadership Training (2011)
Managing For Performance (Watmec, 2008)
Leading Change Agility (Watmec, 2007)
Excelling as a First-Time Manager or Supervisor (SkillPath Seminars, 2006)
Supervisors Workshop (2003)
Planner at the Ontario Municipal Board (OPPI, 2003)
Negotiation and Mediation (OPPI, 2000)
Inspiring Individual Leadership (McMaster University, 2000)

Presentations

Leadership and Emotional Intelligence
Credit Valley Conservation Lean In Session
December 2015

Canadian Water Resources Association
Environmental Flows Decision-Making Framework
November 2015

Hamilton Naturalist's Club, Planning for Nature, January 2015

Carolinian Canada Ecosystem Recovery Forum, Chatham-Kent Natural Heritage Implementation Strategy, October 2014

JACKSON ARBORICULTURE INC.
CONSULTING AND GIS ANALYSIS
118 PLEASANT RIDGE ROAD
BRANTFORD ON
N3R 0B8
JEREMY@JACKSONARBOR.CA
905-512-6303

Jeremy Jackson, H.B.Sc.
Principal
ISA Certified Arborist #ON-1089A
Senior GIS Analyst

EDUCATION:

- 2004 - Honors Bachelor of Science, (Environmental Science and Geographic Information Systems), University of Toronto

PROFESSIONAL ACCREDITATION:

- 2006 - Arborist Certification #ON-1089A, International Society of Arboriculture (ISA)
- 2019 - Certified Butternut Health Assessor #248, MECP

PROFESSIONAL EXPERIENCE:

Mar. '09 to present Certified Arborist, Senior GIS Analyst - Jackson Arboriculture Inc., Brantford, Ontario

Jeremy Jackson is the Principal Owner of Jackson Arboricutlure Inc. As a consulting arborist Mr. Jackson completes various types of arborilogical and forestry related assessments including Tree Inventory and Preservation Plans for small and large scale development applications, Edge Management Plans, Emerald Ash Borer Assessment, Vegetation Conservation Plans, Landscape Tree Certification, Tree Risk Assessment, Woodlot Assessments with respect to Official Plans and Regional by-laws, Woodlot by-law Infraction Assessment, Tree Valuations, Butternut Health Assessments in accordance with MNR protocol and peer review of previous arborilogical and forestry studies. Jeremy has completed many Butternut Health Assessments and has assessed over 300 Butternut Trees for Municipal and private landowners.

As a Senior Geographic Information Systems Analyst Mr. Jackson has completed natural heritage mapping for Waterfront Master Plans, Municipal Secondary Plans and Boundary Review projects. He has determined the urban forest canopy cover of local municipalities in conjunction with Urban Forest Management Plans. Other mapping support roles include Environmental Impact Assessments, Restoration and Planting Plans, and Tree Preservation Plans. Acquisition of data, organization, representation and creation of data are also key mapping roles.

Sept. '05 to Mar. '09 Certified Arborist, GIS Analyst - LGL Limited, environmental research associates, Burlington, Ontario

Responsible for all aspects of graphics, mapping and GIS, as it relates to natural heritage planning and impact assessment. Assist with background data compilation, agency contacts, acquisition of base mapping, data analysis, and in the preparation of graphics for

reports and proposals.

Assessment of tree species, identification, health, size, hazard potential, recommended removal or retention of trees, and preparation of tree preservation plans. Inventory of roadside trees, farmland trees, urban ravine trees, and forest and NDVI sample plot inventories in New Brunswick.

May '05 to Sept. '05 Naturalization Crew Leader - Credit Valley Conservation Authority, Mississauga, Ontario

Supervised a crew of 3 throughout all naturalization projects and nursery plant stock maintenance activities such as potting, pruning, spraying pesticides, irrigating and seed collecting. Assisted in training crew on machinery and responsible for implementation of site planting plans.

2003 to 2005 Naturalization Crew Member - Credit Valley Conservation Authority, Mississauga, Ontario

Primary roles include maintenance of nursery stock and completing assigned planting plans. Received intensive overview of safety code and regulations and developed strong identification skills of trees and shrubs native to southern Ontario.

Appendix C:

Representative Site Photographs taken on May 21 and October 1, 2020.

1600 Kerns Road, Burlington.

Plan B Natural Heritage

October 2020

Photo 1 – Unit FOD4-2 is a young disturbed patch of White Ash, Sugar Maple, Manitoba Maple and Black Walnut. This unit is located on the disturbed slope adjacent to the parking lot onsite. May 21, 2020.

Photo 2 – View of Hager Creek, with Unit FOD4-2 to the upper right. May 21, 2020.

Photo 3 – View of Unit FOD4-2, which is a young patch of White Ash, Sugar Maple, Manitoba Maple and Black Walnut. May 21, 2020.

Photo 4 – View of Unit FOD5-11 on the slope behind Tyandaga Mews townhouse complex. October 1, 2020.

Photo 5 – View of Unit FOD6-1, looking upstream in the Hager Creek ravine bottomland. October 1, 2020. Panorama – Left.

Photo 6 – View looking upstream on Hager Creek at Units FOD6-1 (left and foreground) and Unit FOD5-11 (upper right). October 1, 2020. Panorama – Middle.

Photo 7 – View of Unit FOD5-11, looking upslope towards the daycare centre on the subject property. October 1, 2020. Panorama – Right.

Photo 8 – View of Unit FOD6-1 , looking downstream on Hager Creek. Note the patch of Virginia Cutgrass (*Leersia virginica*), Fowl Manna Grass (*Glyceria striata*), Clearweed (*Pilea pumila*) and Spotted Jewelweed (*Impatiens capensis*) beside the creek. October 1, 2020.

Photo 9 – View of Unit FOD6-1. There are some larger Green Ash that are in severe decline due to the Emerald Ash Borer. The more open canopy under the large ash trees has given rise to dense patched of maple-ash regeneration. October 1, 2020.

Photo 10 – Dense patches of invasive Goutweed (*Aegopodium podagraria* +) are established in Unit FOD6-1 and the area mapped as "Ornamental/Disturbed". Goutweed (+) is an invasive, spreading groundcover that favours floodplain woods. May 21, 2020.

Photo 11 – View looking from top-of-bank towards the parking on the subject property. There are a cluster of planted Austrian Pine (+) in this area.
October 1, 2020. Panorama – Left.

Photo 12 – View looking along top-of-bank in Unit “Ornamental/Disturbed”. The trees are a Honey Locust cultivar. Portions of this area are mown on a regular basis.
October 1, 2020. Panorama – Right.

Photo 13 – View showing a patch of the invasive European Swallow-wort or Dog-strangling Vine (*Cynanchum rossicum* +) in the bottom left of the frame. October 1, 2020.

Photo 14 – View looking up the fill slope towards Four Season's Drive. Note the dense mats of Periwinkle (*Vinca minor* +) that was likely planted at this location. May 21, 2020.

Photo 15 – View looking west along the Four Season's Drive sidewalk. The fill slope down to Hager Creek is to the left. Most of the trees and groundcovers on this slope are not native species. October 1, 2020.

Photo 16 – View looking down the fill slope from Four Season's Drive towards the Hager Creek culvert. October 1, 2020.

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: 1600 KERNS RD., BURLINGTON			POLYGON: FOD4-2
SURVEYOR(S): ANTHONY GOODBAN	DATE: 2020-06-28	TIME: start	
		finish	
UTMZ: 17	UTME: 594130	UTMN: 4799283	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☑ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☐ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	☑ MINERAL SOIL	☐ RIVERINE	☑ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☐ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☑ VALLEY SLOPE		☐ FORB	☐ MARSH
SITE	☐ CARB. BEDRK.	☐ TABLELAND		☐ LICHEN	☐ SWAMP
	x FILL	☐ ROLL. UPLAND		☐ BRYOPHYTE	☐ FEN
☐ OPEN WATER		☐ CLIFF	**COVER**	☑ DECIDUOUS	☐ BOG
☐ SHALLOW WATER		☐ TALUS		☐ CONIFEROUS	☐ BARREN
☒ SURFICIAL DEP.		☐ CREVICE / CAVE	☐ OPEN	☐ MIXED	☐ MEADOW
☐ BEDROCK		☐ ALVAR	☐ SHRUB		☐ PRAIRIE
		☐ ROCKLAND	☑ TREED		☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☑ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	3	4	FRAAMER > ACESASA >> ACENEGU = JUGNIGR
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER	6	2	ALLPETI > HESMATR >> CARBLAN = SOLCAES

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	A	< 10	O	10 - 24	N	25 - 50	N	> 50
STANDING SNAGS:	A	< 10	O	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:	N	< 10	N	10 - 24	N	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:	FOREST	FO
COMMUNITY SERIES:	DECIDUOUS FOREST	FOD
ECOSITE:	DRY-FRESH DECIDUOUS FOREST ECOSITE	FOD4
VEGETATION TYPE:	DRY-FRESH WHITE ASH DECIDUOUS FOREST TYPE	FOD4-2
INCLUSION		
COMPLEX		

Notes:

ELC
PLANT SPECIES LIST

SITE: 1600 KERNS ROAD BURLINGTON
POLYGON: FOD 4-2
DATE: 2020-06-28
SURVEYOR(S): ANTHONY GOODBAN

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
FRA AMER	D				
ACE SASA	A				
ACE NEGU	O				
JUG NIGR	O				
RHA CATH		O			
ALL PETI				D	
HESMATR				A	
CAR BLAN				O	
SOL CAES				O	
SOL FLEX				R	
SOL DULC				R	

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

ELC

MANAGEMENT / DISTURBANCE

SITE: 1600 KERNS ROAD, BURLINGTON
POLYGON: FOD 4-2
DATE: 2020-06-28
SURVEYOR(S): ANTHONY GOODBAN

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	0
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	0
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	6
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	0
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	0
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	2
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	4
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	4
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	4
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER ...FILL.....	NONE	LIGHT	MODERATE	HEAVY	4
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: 1600 KERNS RD., BURLINGTON		POLYGON: FOD 5-11
SURVEYOR(S): ANTHONY GOODBAN	DATE: 2020-06-28	TIME: start / finish
UTMZ: 17	UTME: 594126	UTMN: 4799228

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☒ VALLEY SLOPE ☐ TABLELAND ☐ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☒ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☒ FOREST ☐ PLANTATION

SITE	COVER
☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK	☐ OPEN ☐ SHRUB ☒ TREED

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	ACESASA >> FRAAMER = TILAMER = QUERUBR
2	SUB-CANOPY	3	2	ACESASA = TILAMER = PRUSERO
3	UNDERSTOREY	4	2	ACESASA = FRAAMER = OSTVIRG
4	GRD. LAYER	6	2	CARPENS > CARROSE = GERMACU = ALLPETI

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	O	< 10	O	10 - 24	A	25 - 50	R	> 50
STANDING SNAGS:	R	< 10	O	10 - 24	O	25 - 50	N	> 50
DEADFALL / LOGS:	R	< 10	O	10 - 24	R	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG	X	MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:	FOREST	FO
COMMUNITY SERIES:	DECIDUOUS FOREST	FOD
ECOSITE:	DRY-FRESH SUGAR MAPLE DECIDUOUS FOREST ECOSITE	FOD5
VEGETATION TYPE:	DRY-FRESH SUGAR MAPLE - HARDWOOD DECIDUOUS FOREST TYPE	FOD5-11*
INCLUSION		
COMPLEX		

Notes: * THIS TYPE NOT IN ELC (LEE ET. AL 1998)

ELC
PLANT SPECIES LIST

SITE: 1600 KERNS RD., BURLINGTON
POLYGON: FOD 5-11
DATE: 2020-06-28
SURVEYOR(S): ANTHONY GOODBAN

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER				COL.
	1	2	3	4	
ACENEGJ		R			
ACE PLAT		O			
ACESASA	D	D			
AMEARBO		R			
CARCORD	O	O			
CAROVAT	R	R			
FRAAMER	A	A			
OSTVIRG	O	O			
POPTREM		R			
PRUVIRG			O		
QUERUBR	O				
TILAMER	O	O			
ULMAMER	O	O			
PRUSERO	O	O			
EUOOBOV				O	
PARINSE			O	A	
LONTATA			O		
RHACATH			O		
RHURARY				O	
RUBIDME				O	
~~PRUVIRG~~					
VITRIPA			O		
AGRGRYP				R	
ARITRIP				R	
CARBLAN				A	
CARPENS				O	
CARROSE				O	
CIRLUTE				O	
EQUARVE				O	
ERYAMER				O	

SPECIES CODE	LAYER				COL.
	1	2	3	4	
EUPRUGO				O	
FRAVESC				O	
GERMACU				O	
GERROBE				O	
GEUCANA				O	
GEUURBA				A	
HESMATR				O	
LAPCOMM				O	
LIGVULG			R		
MAIRACE				O	
RANACRI				R	
SOLDULC				O	
SOLCAES				O	
SOLFLEX				O	
SYMLATE				O	
TAROFFI				R	
VEROFFI				O	
VIOCONS				O	
VIOSORO				O	
ALLPETI				A	

ELC

MANAGEMENT / DISTURBANCE

SITE: 1600 KERNS RD., BURLINGTON
POLYGON: FOD5-11
DATE: 2020-06-28
SURVEYOR(S): ANTHONY GOODBAN

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	0
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	2
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	2
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	2
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	0
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	0
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	2
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	1
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	1
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	4
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	2
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	1
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	2
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: 1600 KERNS RD., BURLINGTON		POLYGON: FOD 6-1
SURVEYOR(S): ANTHONY GOODBAN	DATE: 2020-06-28	TIME: start / finish
UTMZ: 17	UTME: 594107	UTMN: 4799249

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☒ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☐ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☒ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☒ FOREST ☐ PLANTATION

SITE	COVER
☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK	☐ OPEN ☐ SHRUB ☒ TREED

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	ACESASA > FRAPEN > ULMAMER = TILAMER
2	SUB-CANOPY	3	2	ACESASA = FRAPENS > ULMAMER
3	UNDERSTOREY	4	3	ACESASA = FRAPENS
4	GRD. LAYER	6	3	AJUREPT = AEGPODA = GLYSTRI = GEUURBA

HT CODES: **1** = >25 m **2** = 10<HT≤25 m **3** = 2<HT≤10 m **4** = 1<HT≤2 m **5** = 0.5<HT≤1 m **6** = 0.2<HT≤0.5 m **7** = HT<0.2 m

CVR CODES **0**= NONE **1**= 0% < CVR ≤ 10% **2**= 10 < CVR ≤ 25% **3**= 25 < CVR ≤ 60% **4**= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	A	25 - 50	R	> 50
STANDING SNAGS:	O	< 10	O	10 - 24	A	25 - 50	R	> 50
DEADFALL / LOGS:	O	< 10	O	10 - 24	O	25 - 50	N	> 50

ABUNDANCE CODES: **N** = NONE **R** = RARE **O** = OCCASIONAL **A** = ABUNDANT

COMM. AGE :		PIONEER		YOUNG	X	MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:	FOREST	FO
COMMUNITY SERIES:	DECIDUOUS FOREST	FOD
ECOSITE:	FRESH-MOIST SUGAR MAPLE DECIDUOUS FOREST ECOSITE	FOD6
VEGETATION TYPE:	FRESH-MOIST SUGAR MAPLE-LOWLAND ASH DECIDUOUS FOREST TYPE	FOD 6-1
INCLUSION		
COMPLEX		

Notes:

ELC
PLANT SPECIES LIST

SITE: 1600 KERNS ROAD, BURLINGTON
POLYGON: FOD 6-1
DATE: 2020-06-28
SURVEYOR(S): ANTHONY GOODBAN

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
ACE NEGU		O	O		
ACE PLAT	O	O	O		
ACE SASA	A	A	O		
CAR CARO			R		
CAR CORD	O	O			
COR RACE			O		
EVO FORT			A		
EVO OBOV			R		
FRA PENN	A	O	A		
JUG NIGR		O			
LIG VULG			O		
LON TATA			O		
OST VIRG		R			
PAR INSE			O	A	
POP TREM	R	O			
PRU SERO		O			
PRU VIRG			O		
RHA CATH			O		
RHA FRAN			R		
RHU RADY				A	
RUB IDME				O	
SAL X SEP	R	R			
SOL DULC				A	
TIL AMER	O	O	R		
TIL CORD			R		
ULM AMER	O	O	R		
ULM PUMI			R		
VIT RIPA				A	
AEG PODA				O	
AGR GRYP				R	

SPECIES CODE	LAYER 1	2	3	4	COL.
AGR STOL				A	
AJU REPT				A	
ALL PETI				A	
ARI TRIP				R	
BID FRON				R	
CAR BLAN				R	
CAR RADI				O	
CAR GRAC				O	
CIR LUTE				O	
ELY VIRG				O	
EQU ARVE				R	
ERY AMER				R	
EUP RUGO				O	
FRA VESC				O	
GER MACU				R	
GER ROBE				O	
GEU CANA				O	
GEU URBA				A	
HES MATR				O	
IMP CAPE				R	
LEE VIRG				R	
MAI RACE				R	
PHA ARUN				R	
PIL PUMI				R	
POD PELT				O	
PRU VULA				O	
RAN ABOR				R	
SOL RUGO				R	
SYM LATE				O	
TAR OFFI				R	
TUS FARF				R	

ELC
PLANT SPECIES LIST

SITE: 1600 KERNS RD., BURLINGTON
POLYGON: FOD6-1
DATE: 2020-06-28
SURVEYOR(S): ANTHONY GOODBAN

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER				COL.
	1	2	3	4	
VEROFFI				R	
VIN MINO				O	
VIO CONS				R	
VIOSORO				R	

SPECIES CODE	LAYER				COL.
	1	2	3	4	

ELC

MANAGEMENT / DISTURBANCE

SITE: 1600 KERNS RD., BURLINGTON
POLYGON: FOD 6-1
DATE: 2020-06-28
SURVEYOR(S): ANTHONY GOODBAN

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	2
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	4 EAB
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	4
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	1
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	1
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	2
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	1
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	4
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	4 EAB
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	1
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	1
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	1
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	0
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	1
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

JOB Burlington

DATE 6/1/20 PAGE

7 05

A	<100	>100	Flyover	TOTAL
AMCR	II			2
CEDW	I			1
EUST			I	1
REVI	I	II		3
BAOR		I		1
AMRO	II	I		3
BHIO		I		1
CCRL		I		1
EWPC		I		1

B	4 Seasons & Croton			7 32
	<100	>100m	Flyover	TOTAL
HOFI	I			1
HOSP	I			1
AMRO	I	I		2
RBGU			I	1
RWBL	I	I		2
EUST		IIII		5

PARTY CHIEF 12

WEATHER Wind Beaufort 2 70% cloud

JOB Burlington

DATE 6/1/20 PAGE

7 50

C	<100m	>100m	Flyover	TOTAL
HOSP	IIII			4
RWBO	I			1
AMRO	II	III		5
RWBL	II			2
EUST	I			1

PARTY CHIEF 14 cel

WEATHER Beaufort 1 70% cloud

JOB Burlington Kerr

DATE 6/15/20 PAGE VISIT 2

1 925

	<100M	>100M	Flyover	TOTAL
AMGF	1			
HOWR	1			
COGR	1			
AMCR		1		
AMRO		2		
BCCH	1	1		

2

PARTY CHIEF

WEATHER 16°C WIND 3 20% cld

JOB Burlington

DATE 6/15/20 PAGE VISIT 2

3 ~~855~~ am

	<100	>100	Fly	TOTAL
HOSP	IIII I			6
AMGF	II			2
EUST	III			3
CHSP	II			2
NOCA		1		1
CEDW	1			1

(2) 906

	<100	>100M	Flyover	TOTAL
AMRO	III			3
HOSP	1			1
NOCA		1		1
AMGF		1		1
EUST	1			1

PARTY CHIEF

WEATHER

Appendix E: Vascular Plant Checklist 1600 Kerns Road, Burlington						
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**C C**	**C W**	**Planted**
Acer negundo	Manitoba Maple		S5	0	-2	
Acer platanoides	Norway Maple	I	SE5	*	5	Planted & Escape
Acer saccharum saccharum	Sugar Maple		S5	4	3	
Aegopodium podagraria	Goutweed	I	SE5	*	0	
Agrimonia gryposepala	Yellow Agrimony		S5	2	2	
Agrostis stolonifera	Creeping Bent Grass		S5	0	-3	
Ajuga reptans	Ajuga	I	SE2	*	5	Planted & Escape
Alliaria petiolata	Garlic Mustard	I	SE5	*	0	
Amelanchier arborea	Juneberry		S5	5	3	
Arctium minus	Common Burdock	I	SE5	*	5	
Arisaema triphyllum triphyllum	Jack-in-the-pulpit		S5	5	-2	
Bidens frondosa	Devil's Beggar-ticks		S5	3	-3	
Carex blanda	Smooth Sedge		S5	3	0	
Carex gracillima	Graceful Sedge		S5	4	3	
Carex pensylvanica	Pennsylvania Sedge		S5	5	5	
Carex radiata	Sedge		S5	4	5	
Carex rosea	Sedge		S5	5	5	
Carpinus caroliniana	Blue-beech		S5	6	0	
Carya cordiformis	Bitternut Hickory		S5	6	0	
Carya ovata	Shagbark Hickory		S5	6	3	
Circaea lutetiana canadensis	Enchanter's Nightshade		S5	3	3	
Cirsium arvense	Canada Thistle	I	SE5	*	3	
Cornus foemina racemosa	Grey Dogwood		S5	2	-2	
Cynanchum rossicum	Dog-strangling Vine	I	SE5	*	5	
Elymus virginicus	Virginia Wild-rye		S5	5	-2	

Appendix E: Vascular Plant Checklist 1600 Kerns Road, Burlington						
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**C C**	**C W**	**Planted**
Equisetum arvense	Field Horsetail		S5	0	0	
Erythronium americanum americanum	Yellow Trout-lily		S5	5	5	
Euonymus fortunei	Wintercreeper	I	SE1	*	5	Planted & Escape
Euonymus obovata	Running Strawberry-bush		S5	6	5	
Eupatorium rugosum	White Snakeroot		S5	5	3	
Festuca rubra	Red Fescue	I	SE5	*	1	
Fragaria vesca americana	Woodland Strawberry		S5	4	4	
Fraxinus americana	White Ash		S5	4	3	
Fraxinus pennsylvanica	Red Ash, Green Ash		S5	3	-3	
Geranium maculatum	Wild Geranium		S5	6	3	
Geranium robertianum	Herb Robert	I	SE5	*	5	
Geum canadense	White Avens		S5	3	0	
Geum urbanum	Urban Avens	I	SE2	*	5	
Gleditsia triacanthos	Honey Locust		S2	3	0	Planted
Glyceria striata	Fowl Manna Grass		S5	3	-5	
Hesperis matronalis	Dame's Rocket	I	SE5	*	5	
Impatiens capensis	Spotted Touch-me-not		S5	4	-3	
Juglans nigra	Black Walnut		S4	5	3	
Lapsana communis	Nipplewort	I	SE5	*	5	
Leersia virginica	White Grass		S4	6	-3	
Ligustrum vulgare	Privet	I	SE5	*	1	
Lonicera tatarica	Tartarian Honeysuckle	I	SE5	*	3	
Maianthemum racemosum racemosum	Tall False Solomon's-seal		S5	4	3	
Ostrya virginiana	Ironwood		S5	4	4	
Parthenocissus inserta	Virginia Creeper		S5	3	3	

Appendix E: Vascular Plant Checklist 1600 Kerns Road, Burlington						
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**C C**	**C W**	**Planted**
Phalaris arundinacea	Reed Canary Grass		S5	0	-4	
Pilea pumila	Clearweed		S5	5	-3	
Pinus nigra	Austrian Pine	I	SE2	*	-5	Planted
Poa pratensis	Kentucky Blue Grass		S5	0	1	
Podophyllum peltatum	May-apple		S5	5	3	
Populus tremuloides	Trembling Aspen		S5	2	0	
Prunella vulgaris lanceolata	Heal-all		S5	5	5	
Prunus serotina	Wild Black Cherry		S5	3	3	
Prunus virginiana virginiana	Chokecherry		S5	2	1	
Quercus rubra	Red Oak		S5	6	3	
Ranunculus abortivus	Small-flowered Buttercup		S5	2	-2	
Ranunculus acris	Tall Buttercup	I	SE5	*	-2	
Rhamnus cathartica	Common Buckthorn	I	SE5	*	3	
Rhamnus frangula	Alder Buckthorn	I	SE5	*	-1	
Rhus radicans rydbergii	Rydberg's Poison-ivy		S5	0	0	
Ribes rubrum	Garden Red Currant	I	SE5	*	5	
Rosa multiflora	Multiflora Rose	I	SE4	*	3	
Rubus allegheniensis	Common Blackberry		S5	2	2	
Rubus idaeus melanolasius	Wild Red Raspberry		S5	0	-2	
Rumex crispus	Curly Dock	I	SE5	*	-1	
Salix x sepulcralis	Weeping Willow	I	SE2	*	-4	Planted & Escape
Securigera varia (Coronilla varia)	Crown Vetch	I	SE5	*	5	
Solanum dulcamara	Climbing Nightshade	I	SE5	*	0	
Solidago altissima	Tall Goldenrod		S5	1	3	
Solidago caesia	Blue-stem Goldenrod		S5	5	3	

Appendix E: Vascular Plant Checklist 1600 Kerns Road, Burlington						
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**C C**	**C W**	**Planted**
Solidago flexicaulis	Zig-zag Goldenrod		S5	6	3	
Solidago rugosa rugosa	Rough Goldenrod		S5	4	-1	
Symphyotrichum lateriflorum var. lateriflorum (Aster lateriflorus)	One-sided Aster		S5	3	-2	
Symphyotrichum novae-angliae (Aster novae-angliae)	New England Aster		S5	2	-3	
Taraxacum officinale	Common Dandelion	I	SE5	*	3	
Tilia americana	American Basswood		S5	4	3	
Tilia cordata	Little-leaf Linden	I	SE1	*	5	Planted & Escape
Tussilago farfara	Coltsfoot	I	SE5	*	3	
Ulmus americana	White Elm		S5	3	-2	
Ulmus pumila	Siberian Elm	I	SE3	*	5	
Veronica arvensis	Corn Speedwell	I	SE5	*	5	
Veronica officinalis	Common Speedwell	I	SE5	*	5	
Vinca minor	Common Periwinkle	I	SE5	*	5	Planted & Escape
Viola conspersa	Dog Violet		S5	4	-2	
Viola sororia	Common Blue Violet		S5	4	1	
Vitis riparia	Riverbank Grape		S5	0	-2	

Appendix F – Breeding Bird Point Count Survey Data

June 1st, 2020

Station 1 7:05

Species	<100 m	>100 m
American Goldfinch	2	
Cedar Waxwing	1	
European Starling	1	
Red-eyed Vireo	1	2
American Robin	2	1
Brown-headed Cowbird		1
Great-crested Flycatcher		1
Eastern Wood-Pewee		1
Baltimore Oriole		1

Station 2 7:32

Species	<100 m	>100 m
House Finch	1	
House Sparrow	1	
American Robin	1	1
Ring-billed Gull		1
Red-winged Blackbird	1	1
European Starling		5

Station 3 7:50

Species	<100 m	>100 m
House Sparrow	4	
Mourning Dove	1	
American Robin	2	3
Red-winged Blackbird	2	
European Starling	1	

June 15th, 2020

Station 1 9:25

Species	<100m	>100m
American Goldfinch	1	
House Wren	1	
Common Grackle	1	
American Crow		1
American Robin		2
Black-capped Chickadee	1	1

Station 2 9:06

Species	<100m	>100m
American Robin	3	
House Sparrow	1	
Northern Cardinal		1
American Goldfinch		1
European Starling	1	

Station 3 8:55

Species	<100m	>100m
House Sparrow	6	
American Goldfinch	2	
European Starling	3	
Chipping Sparrow	2	
Northern Cardinal		1
Cedar Waxwing	1	

APPENDIX F - Bird Species Observations - June 1st and June 15th, 2020 - 1600 Kerns Road

COLUMBIFORMES: Columbidae	**Scientific Name**	**Breeding Evidence (OBBA protocol)**
Mourning Dove	Zenaida macroura	Possible (H in suitable habitat)
CHARADRIIFORMES: Laridae		
Ring-billed Gull	Larus delawarensis	Non Breeding (X observed flyover)
PASSERIFORMES: Tyrannidae		
Eastern Wood-Pewee	Contopus virens	Possible (S Singing/calling bird)
Great Crested Flycatcher	Myiarchus crinitus	Possible (S Singing/calling bird)
PASSERIFORMES: Vireonidae		
Red-eyed Vireo	Vireo olivaceus	Probable (Pair)
PASSERIFORMES: Corvidae		
American Crow	Corvus brachyrhynchos	Possible (H in suitable habitat)
PASSERIFORMES: Paridae		
Black-capped Chickadee	Poecile atricapillus	Probable (Pair)
PASSERIFORMES: Troglodytidae		
House Wren	Troglodytes aedon	Possible (H in suitable habitat)
PASSERIFORMES: Sturnidae		
European Starling	Sturnus vulgaris	Confirmed (carrying food)
PASSERIFORMES: Turdidae		
American Robin	Turdus migratorius	Confirmed (carrying food)
PASSERIFORMES: Bombycillidae		
Cedar Waxwing	Bombycilla cedrorum	Possible (H in suitable habitat)
PASSERIFORMES: Passeridae		
House Sparrow	Passer domesticus	Probable (Pair)
PASSERIFORMES: Fringillidae		
House Finch	Haemorhous mexicanus	Possible (H in suitable habitat)
American Goldfinch	Spinus tristis	Probable (on territory)
PASSERIFORMES: Passerellidae		
Chipping Sparrow	Spizella passerina	Probable (Pair)

PASSERIFORMES: Icteridae

Baltimore Oriole	Icterus galbula	Possible (H in suitable habitat)
Red-winged Blackbird	Agelaius phoeniceus	Probable (Pair)
Brown-headed Cowbird	Molothrus ater	Possible (H in suitable habitat)
Common Grackle	Quiscalus quiscula	Possible (H in suitable habitat)

PASSERIFORMES: Cardinalidae

Northern Cardinal	Cardinalis cardinalis	Possible (S Singing/calling bird)

JACKSON
ARBORICULTURE
INC.
CONSULTING AND GIS ANALYSIS
118 Pleasant Ridge Road, Brantford ON, N3R 0B8
905-512-6303, jeremy@jacksonarbor.ca

Tree Inventory and Preservation Plan Report

Subject Property:

1600 Kerns Road
Burlington, ON

Prepared For:

Fieldgate Homes
15 Bandera Drive
Brampton, ON L6Y 0H8

Prepared By:

Jackson Arboriculture Inc.
118 Pleasant Ridge Rd.
Brantford ON N3R 0B8

24 March 2021
Revised 16 February 2022
Jackson Arboriculture Inc. Project No. 207

1.0 Introduction

Jackson Arboriculture Inc. was retained by Fieldgate Homes to complete a Tree Inventory and Preservation Plan for a property located at 1600 Kerns Road, in the City of Burlington, Ontario, hereby referred to as the subject property. It is understood that a development application will be filed with the City for the redevelopment of the subject property.

The following study has been completed in accordance with the City of Burlington's Specifications Index for Tree Protection and Preservation (SPEC NO. SS12A) and the Site Plan Application Guidelines.

2.0 Methodology

At the onset of the project the arborilogical scope of work was coordinated with the client and the consulting team. Prior to conducting a site visit, the topographic survey of the subject property and current aerial photography were overlaid utilizing geographic information software, for use on site during the completion of the tree inventory. The tree locations, the topographic survey and the site plan were overlaid and a tree preservation analysis was completed to determine the impacts to each tree included in the inventory.

2.1 Tree Inventory

A site visit was conducted on the 21st of May 2020 and on the 27th of January 2022 to complete the tree inventory. All trees 10 cm in diameter and larger situated on subject property, on neighbouring property within 3 m and within the road allowances were included in the tree inventory. A visual assessment was completed on each tree included in the inventory and the following information is provided in the tree inventory table (Table 1):

- **Tree #**: A number assigned to each tree correlating to the tree inventory and the Tree Preservation Plan (Figure 1)
- **Species**: Common and scientific (Latin) species names.
- **DBH**: The trunk diameter at breast height, measured in centimeters at 1.4 m from the ground.
- **Condition**: The health of the tree considering the structure and health rated as a percentage.
- **Impacts**: The percent impact to the mTPZ.
- **mTPZ**: Minimum Tree Preservation Zone, i.e. the distance in meters from the base of the tree trunk at which tree protection fence is to be installed.
- **Location**: The property where the tree is situated, based on the topographic survey.
- **Comments**: Any additional notes relevant to the tree's health or growing conditions.
- **Action**: The recommended removal or preservation of each tree based on the impact assessment.

The trees included in the inventory are identified with numbers 1-42 and were located using the topographic survey provided and a tablet computer with a GPS chip.

2.2 Impact Assessment

A tree preservation analysis was completed on each tree individually considering the impacts from the proposed development and many other factors including, but not limited to, tree condition, species, DBH and the existing site conditions. The impacts from the proposed development will occur where tree roots conflict with construction machinery during demolition, pre-grading, foundation excavation, grading and servicing.

During the tree preservation analysis the minimum Tree Protection Zone (mTPZ) distance, as outlined in the City's Specifications Index for Tree Protection and Preservation, was utilized to determine the potential impacts to each tree included in the inventory. Where encroachment is required within the mTPZ, tree removal may be required.

The mTPZ distance is the minimum distance at which development can safely occur without appreciably damaging a tree's root system. The mTPZ distance is based on the diameter of the tree and measured in meters from the base of the stem. Refer to Table 2 for the mTPZ distances based on trunk diameter.

Table 2. Minimum tree protection zone distances.

DBH (cm)	Min. Tree Preservation Zone Distance (m)*
	Radius
< 10	1.8
10 – 40	2.4
41 – 50	3.0
51 – 60	3.6
61 – 70	4.2
71 – 80	4.8
81 – 90	5.4
91 – 100	6.0
101 – 110	6.6

*As measured from the outside of the tree trunk.

3.0 Existing Conditions

The subject site is located at 1600 Kerns Road and is occupied by a commercial strip mall. A woodland dripline and top of bank travers the western portion of the site in a north to south direction. The site is bound by Four Seasons Road to the north, Kerns Road to the east, residential development to the south and woodland to the west.

4.0 Tree Inventory Results

The results of the tree inventory indicate that a total of 44 trees situated on the subject property, on the neighbouring property and within the road allowances were included in the inventory. The trees included in the tree inventory are those situated on the tableland portion of the site beyond the staked dripline.

The trees included in the inventory are comprised of the following species:

- Austrian Pine (*Pinus nigra*),
- Norway Maple (*Acer platanoides*),
- Honey Locust cultivar (*Gleditsia triacanthose var. 'inermis'*),
- Fir species (*Abies sp.*),
- Little-leaf Linden (*Tilia cordata*),
- Copper Beech (*Fagus sylvatica*),
- Norway Spruce (*Picea abies*),
- Eastern Red Cedar (*Juniperus virginiana*),
- Sycamore (*Platanus occidentalis*),
- Sugar Maple (*Acer saccharum*) and
- Scots Pine (*Pinus sylvestris*).

No rare, threatened or endangered tree species were documented in the tree inventory. Refer to Table 1 for the complete tree inventory, Figure 1 for the tree locations and Appendix 1 for site photos.

5.0 Proposed Development

The proposed development is comprised of a four storey retirement home with below ground parking. None of the proposed development structures are situated within the 7.5 m stable top of slope setback, however, some disturbance will be required within the setback area to remove existing development and to accommodate some minor grading associated with the proposed development.

6.0 Discussion

The following sections outline the tree removal requirements, tree preservation opportunities and tree preservation recommendations.

6.1 Tree Removal

Removal of Trees 1-7, 17, 17a, 19-24, 27-29, 35-39 and 41 will be required to accommodate the proposed development.

Trees 17 and 17a are situated within the City road allowance and permission from the City is required prior to its removal.

A restoration plan has been prepared as part of the Environmental Impacts Assessment outlining tree and shrub plantings within the top-of-bank and woodland buffers. Trees identified for removal within the buffer for grading purposes (3 trees) will be replaced on a 3:1 basis within the buffer or ravine.

6.2 Tree Preservation

Preservation of Trees 8-16, 18, 18a, 25, 26, 30-34, 40 and 42 will be possible with appropriate tree protection measures. Tree protection measures will have to be implemented prior to the commencement of construction to ensure trees identified for preservation are not impacted by the proposed development.

Where trees are identified for preservation adjacent to the underground parking structures vertical piles may be required to prevent the soil in the tree protection zone from collapsing into the area excavated to construct the parking structure.

It appears that encroachment within the mTPZs of Trees 8, 10, 12, 14, 16, 18 and 18a will be required to accommodate the proposed development. The areas of encroachment are currently occupied by impermeable surfaces and as such there should be no impacts. If any roots are exposed during construction they must be pruned by a Certified Arborist in accordance with good arboricultural practice.

Refer to Figure 1 for the prescribed location of tree protection fence, the tree protection fence detail and further tree preservation notes.

6.3 Tree Protection Recommendations

The following recommendations are made in attempts to reduce the impacts to trees identified for preservation:

- Tree protection fence must be installed at the mTPZ distances and locations outlined in Table 1 and on Figure 1 prior to the commencement of demolition, unless noted otherwise in this report and on Figure 1.
- Once tree protection fence has been installed it must not be moved, relocated or altered in any way (unless repairing fallen fence etc.) for the duration of the construction period.
- No intrusion into an area identified on Figure 1 as a tree preservation zone (TPZ) is allowed at anytime during construction.
- No storage of machinery, construction debris, materials, waste or any other items is allowed within a TPZ.
- Any tree branches (and roots) that conflict with proposed development must be pruned by a Certified Arborist in accordance with good arboricultural practice.
- Tree protection fencing should be inspected by a Certified Arborist prior to and during construction to ensure that the fencing remains intact and in good repair throughout the stages of development.

7.0 Summary

Jackson Arboriculture Inc. was retained by Fieldgate Homes to complete a Tree Inventory and Preservation Plan for a property located at 1600 Kerns Road, in the City of Burlington, Ontario. A tree inventory was conducted and an impact assessment was completed in the context of the proposed development plan.

The findings of the study indicate that a total of 44 trees were situated on subject property, in the road allowance and on neighbouring properties with the potential to be impacted by the proposed development. Removal of 24 trees will be required to accommodate the proposed development.

Respectfully submitted,
Jackson Arboriculture Inc.

Jeremy Jackson

Jeremy Jackson, H.B.Sc.,
ISA Certified Arborist #ON-1089A
GIS Analyst

Limitations of Assessment

It is our policy to attach the following limitations of assessment to ensure that the client, municipalities and agencies are fully aware of what is technically and professionally realistic when visually assessing and retaining trees.

The assessment of the trees presented in this report has been made using accepted arboricultural techniques. These include a visual examination of the above ground parts of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of attack by insects, discoloured foliage, the condition of any visible root structures, the degree and direction of any lean, the general condition of the trees and the surrounding site, and the proximity of property and people.

Notwithstanding the recommendations and conclusions made in this report, it must be realized that trees are living organisms and their health and vigour constantly change. They are not immune to changes in site conditions, or seasonal variations in the weather conditions, including severe storms with high-speed winds.

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy no guarantees are offered, or implied, that these trees, or any parts of them, will remain standing. It is both professionally and practically impossible to predict with absolute certainty the behaviour of any single tree of group of trees or their component parts in al circumstances. Inevitably a standing tree will always pose some risk. Most trees have the potential for failure under adverse weather conditions, and the risk can only be eliminated if the tree is removed.

Although every effort has been made to ensure that this assessment is reasonably accurate, trees should be re-assessed periodically. The assessment presented in this report is valid as the time of the inspection.

Table 1. Tree Inventory

Location: 1600 Kerns Rd, Burlington Date: 21 May 2020/ 27 Jan. 2022 Surveyors: JJJ

Tree #	Common Name	Scientific Name	DBH	Structure (%)	Health (%)	Impacts (%)	Location	mTPZ	Comments	Action
1	Austrian Pine	*Pinus nigra*	34	37	12	100	Subject property	2.4	60% crown dieback	Remove
2	Austrian Pine	*Pinus nigra*	37	60	37	100	Subject property	2.4	30% crown dieback, trunk is 1.8 m from edge of asphalt	Remove
3	Norway Maple	*Acer platanoides*	31	95	80	100	Subject property	2.4	10% crown dieback	Remove
4	Norway Maple	*Acer platanoides*	46	12	37	100	Subject property	3.0	Union at 1.6 m, girdling root, stem wound, sheer crack in lowest limb, 30% crown dieback	Remove
5	Norway Maple	*Acer platanoides*	43	80	95	100	Subject property	3.0	Girdling root, trunk is 1.3 m from the edge of asphalt	Remove
6	Honey Locust cultivar	*Gleditsia triacanthos var. 'inermis'*	24	95	95	100	Subject property	2.4	Base of the trunk is 1.2 m from the edge of asphalt to the southeast	Remove
7	Fir species	*Abies sp.*	25	80	80	100	Subject property	2.4	Leader has died	Remove
8	Honey Locust cultivar	*Gleditsia triacanthos var. 'inermis'*	25	95	95	0	Subject property	2.4	Base of the tree is 1.8 m from the edge of the asphalt parking lot	Preserve
9	Honey Locust cultivar	*Gleditsia triacanthos var. 'inermis'*	20	95	95	0	Subject property	2.4		Preserve
10	Honey Locust cultivar	*Gleditsia triacanthos var. 'inermis'*	24	95	95	0	Subject property	2.4	Base of the tree is 1.2 m from the edge of the asphalt parking lot	Preserve
11	Honey Locust cultivar	*Gleditsia triacanthos var. 'inermis'*	22	95	95	0	Subject property	2.4	Crook	Preserve
12	Honey Locust cultivar	*Gleditsia triacanthos var. 'inermis'*	23	95	95	0	Subject property	2.4	Union at 1.8 m, base of the tree is 1.1 m from the edge of the asphalt parking lot	Preserve
13	Fir species	*Abies sp.*	23	95	95	0	Subject property	2.4		Preserve
14	Austrian Pine	*Pinus nigra*	41	95	95	0	Subject property	3.0		Preserve
15	Austrian Pine	*Pinus nigra*	53	95	95	0	Subject property	2.4		Preserve
16	Austrian Pine	*Pinus nigra*	45	95	80	0	Subject property	3.0	Light lean east	Preserve
17	Norway Maple	*Acer platanoides*	27	12	80	80	Public ROW	2.4	Heavy stem wound at flare, sweep, 5% crown dieback	Remove
17a	Sycamore	*Platanus occidentalis*	4	95	95	80	Public ROW	1.8		Remove
18	Honey Locust cultivar	*Gleditsia triacanthos var. 'inermis'*	34	95	95	0	Public ROW	2.4	Union at 2.2 m	Preserve
18a	Sugar Maple	*Acer saccharum*	4	95	95	0	Public ROW	1.8		Preserve
19	Little-leaf Linden	*Tilia cordata*	17, 16	60	95	100	Subject property	2.4	Union at 0.4 m with included bark, swollen/scarred flare, coppice growth	Remove
20	Little-leaf Linden	*Tilia cordata*	17, 23, 14	60	95	100	Subject property	2.4	Union at 1.2 m, swollen flare, coppice growth	Remove

Tree #	Common Name	Scientific Name	DBH	Structure (%)	Health (%)	Impacts (%)	Location	mTPZ	Comments	Action
22	Austrian Pine	*Pinus nigra*	46	37	12	80	Subject property	3.0	Top of crown dead, 50% crown dieback	Remove
23	Austrian Pine	*Pinus nigra*	37	95	95	80	Subject property	2.4		Remove
24	Norway Maple	*Acer platanoides*	33	60	60	70	Subject property	2.4	Pruning wounds, seams, 15% crown dieback	Remove
25	Norway Spruce	*Picea abies*	~25	95	95	0	1548-1588 Kerns Rd.	2.4		Preserve
26	Eastern Red Cedar (Juniper)	*Juniperus virginiana*	~15	95	95	0	1548-1588 Kerns Rd.	2.4		Preserve
27	Norway Maple	*Acer platanoides*	12	60	60	70	Subject property	2.4	10% crown dieback	Remove
28	Scots Pine	*Pinus sylvestris*	32	80	95	70	Subject property	2.4	Light lean north	Remove
29	Norway Maple	*Acer platanoides*	31	37	37	70	Subject property	2.4	Heavy stem wound at flare, 50% crown dieback	Remove
30	Austrian Pine	*Pinus nigra*	~20	95	95	0	1548-1588 Kerns Rd.	2.4		Preserve
31	Little-leaf Linden	*Tilia cordata*	~20-30	80	95	0	1548-1588 Kerns Rd.	2.4	Many stems, union at 1 m	Preserve
32	Little-leaf Linden	*Tilia cordata*	~17, 20	80	95	0	1548-1588 Kerns Rd.	2.4	Union at 0.75 m	Preserve
33	Norway Spruce	*Picea abies*	~25	95	95	0	1548-1588 Kerns Rd.	2.4		Preserve
34	Norway Spruce	*Picea abies*	~18	95	95	0	1548-1588 Kerns Rd.	2.4		Preserve
35	Norway Maple	*Acer platanoides*	27	12	12	70	Subject property	2.4	60% crown dieback	Remove
36	Austrian Pine	*Pinus nigra*	28, 25	60	95	70	Subject property	2.4	Union at 0.5 m with included bark	Remove
37	Little-leaf Linden	*Tilia cordata*	11	80	95	80	Subject property	2.4	Natural pruning wounds, understorey	Remove
38	Scots Pine	*Pinus sylvestris*	25	95	95	80	Subject property	2.4		Remove
39	Little-leaf Linden	*Tilia cordata*	21	60	95	80	Subject property	2.4	Natural pruning wounds, union at 1.5 m	Remove
40	Norway Spruce	*Picea abies*	~30	95	95	0	1548-1588 Kerns Rd.	2.4		Preserve
41	Scots Pine	*Pinus sylvestris*	26	95	95	80	Subject property	2.4	Light crook	Remove
42	Norway Maple	*Acer platanoides*	~35	60	60	0	1548-1588 Kerns Rd.	2.4	Union at 2 m, 25% crown dieback	Preserve

Table Legend		
DBH	Diameter at Breast Height	(cm)
TI	Trunk Integrity	(G, F, P)
CS	Crown Structure	(G, F, P)
CV	Crown Vigor	(G, F, P)
CDB	Crown Die Back	(%)
mTPZ	Minimum Tree Preservation Zone	(m)
~=estimate, G=Good, F=Fair, P=Poor		

Appendix A: Site Photos

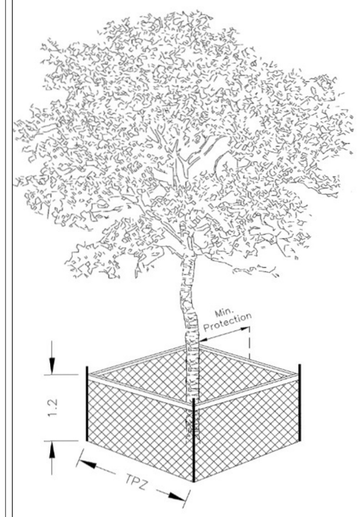
Photo 1: Trees 14-16.

Photo 2: Tree 17.

Photo 3: Tree 18.

Photo 4: Trees 19-21.

Photo 5: Trees 29 to 39.



Detail TP-1 – Tree Protection Detail.

Trunk Diameter (DBH) [2]	Minimum Tree Protection Zone (MTPZ) Distances Required [3]	Critical Root Zone (CRZ) Distances Required [3&4]
< 10 cm	1.8 m	1.8 m
11 - 40 cm	2.4 m	4.0 m
41 - 50 cm	3.0 m	5.0 m
51 - 60 cm	3.6 m	6.0 m
61 - 70 cm	4.2 m	7.0 m
71 - 80 cm	4.8 m	8.0 m
81 - 90 cm	5.4 m	9.0 m
91 - 100+ cm	6.0 m	10.0 m

NOTES:

[1] The roots of a tree can extend from the trunk to approximately 2-3 times the distance of the drip line.
[2] Diameter at breast height (DBH) is the measurement of tree trunk taken at 1.4 metres above ground.
[3] Minimum Tree Protection Zone and Critical Root Zone distances are to be measured from the outside edge of the tree base towards the drip line and may be limited by an existing paved surface, provided the existing paved surface remains intact throughout the construction work and is subject to Section 6 of this specification.
[4] Where work is being performed beyond the Minimum Tree Protection Zone but within the Critical Root Zone the works are subject to Section 8 of this specification.

TREE PROTECTION BARRIER

1. The required barrier is a 1.2 metre (4 ft) high orange plastic web snow fencing on 2" x 4" frame. Where orange plastic web snow fencing creates a restriction to sightlines, page wire fencing with reflective tape can be used.
2. Tree protection barriers are to be erected prior to the commencement of any construction or grading activities on the site and are to remain in place throughout the entire duration of the project. The barriers shall be maintained erect and in good repair throughout the duration of construction operations with breaks and unsupported sections repaired immediately. Tree protection may be not be removed prior to the completion of construction without written authorization from the City Arborist.
3. All supports and bracing used to safely secure the barrier should be located outside the MTPZ. All supports and bracing should minimize damage to roots.
4. Where some fill or excavated material must be temporarily located near a MTPZ, a wooden barrier with silt fencing must be used to ensure no material enters the MTPZ.
5. No materials or fill may be stored within the MTPZ.
6. Equipment or vehicles shall not be operated, parked, repaired, or refueled within the MTPZ.
7. No construction activity, grade changes, surface treatment or excavations of any kind is permitted within the MTPZ without written authorization from the City Arborist.
8. A laminated Minimum Tree Protection Zone sign (See Detail TP-3 – Minimum Tree Protection Zone Sign) must be attached to the side of the Tree Protection where it will be visible by persons entering the site. Minimum size must be 10"x14".

Burlington

TREE PROTECTION ZONE (TPZ)

No equipment or vehicles shall be operated, parked, repaired or refueled within the Tree Protection Zone.

No construction activity, grade changes, surface treatment or excavations of any kind is permitted within the Tree Protection Zone.

No materials or fill may be stored within the Tree Protection Zone.

This tree protection barrier must not be removed prior to the completion of construction without written authorization from the City of Burlington, Urban Forestry Department.

For information, contact:
City of Burlington, Development and Infrastructure Division,
905-335-7642.

Detail TP-3 – Minimum Tree Protection Zone Sign

TREE PROTECTION PLAN NOTES

Prior to site disturbance the owner must confirm that no migratory birds are making use of the site for nesting. The owner must ensure that the works are in conformance with the Migratory Bird Convention Act and that no migratory bird nests will be impacted by the proposed work. It is the applicants' responsibility to discuss potential tree injury of trees on shared property lines with their neighbours. Should such trees be injured to the point of instability or death the applicant may be held responsible for removal and such issues would be dealt with in civil court or through negotiation.

TREE PROTECTION ZONE: No construction activity including grade changes, surface treatments or excavations of any kind is permitted within the area identified on the Tree Protection Plan or Site Plan as a Tree Protection Zone (TPZ). No root cutting is permitted. No storage of materials or fill is permitted within the TPZ. No movement or storage of vehicles or equipment is permitted within the TPZ. Grade changes are not permitted within established TPZ. The area(s) identified as a TPZ must remain undisturbed at all times.

TREE PROTECTION BARRIERS:

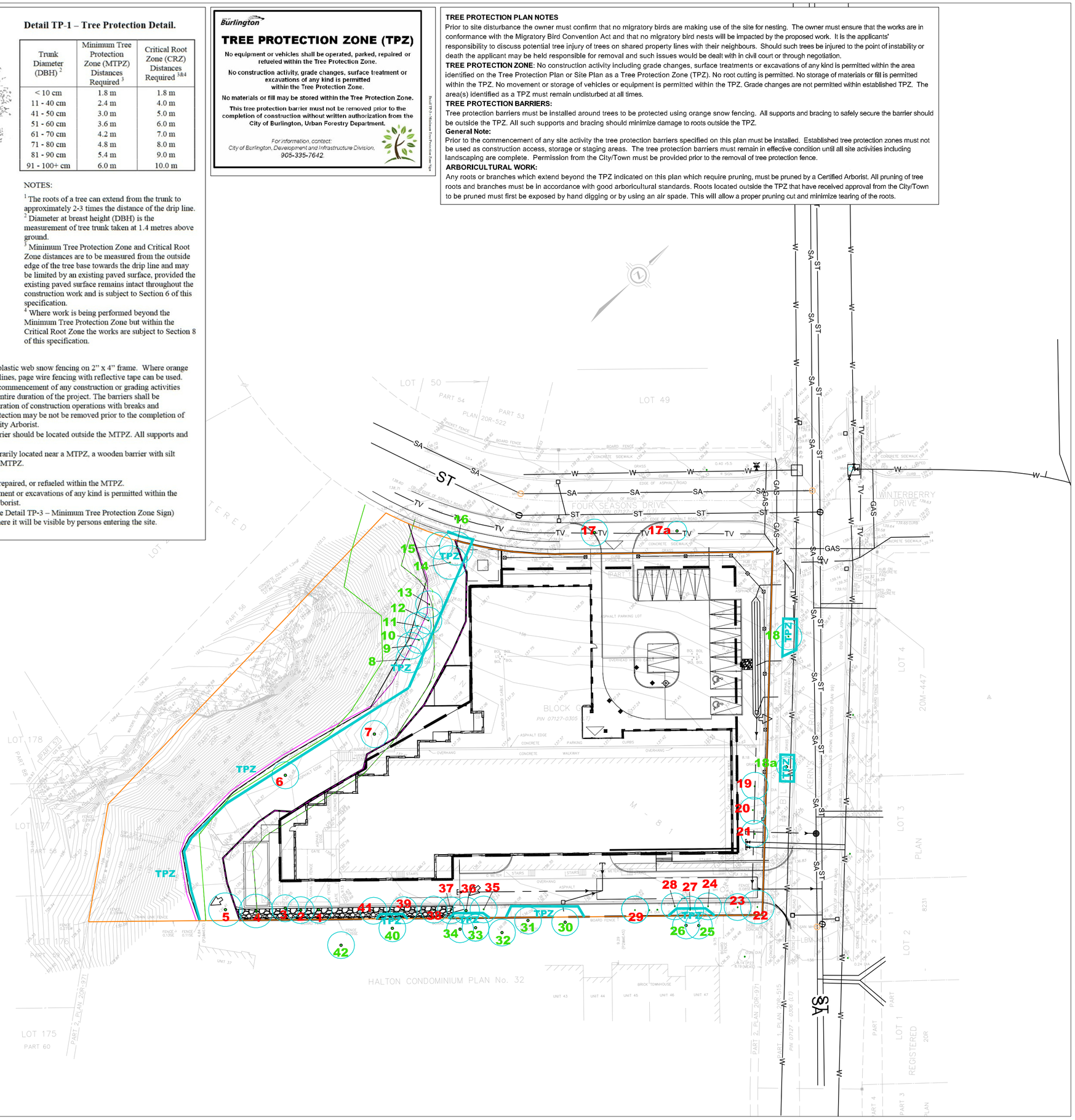
Tree protection barriers must be installed around trees to be protected using orange snow fencing. All supports and bracing to safely secure the barrier should be outside the TPZ. All such supports and bracing should minimize damage to roots outside the TPZ.

General Note:

Prior to the commencement of any site activity the tree protection barriers specified on this plan must be installed. Established tree protection zones must not be used as construction access, storage or staging areas. The tree protection barriers must remain in effective condition until all site activities including landscaping are complete. Permission from the City/Town must be provided prior to the removal of tree protection fence.

ARBORICULTURAL WORK:

Any roots or branches which extend beyond the TPZ indicated on this plan which require pruning, must be pruned by a Certified Arborist. All pruning of tree roots and branches must be in accordance with good arboricultural standards. Roots located outside the TPZ that have received approval from the City/Town to be pruned must first be exposed by hand digging or by using an air spade. This will allow a proper pruning cut and minimize tearing of the roots.



Legend

- Surveyed Tree Location
- GPS Tree Location
- Minimum Tree Preservation Zone (for planning purposes only)
- Tree Preservation Fencing Location
- Property Boundary
- Staked Dripline
- Top of Bank
- 7.5 m Top of Bank Setback
- 10 m Dripline Setback
- 15 — Tree Identified for Preservation
- 28 — Tree Identified for Removal
- TPZ — Tree Preservation Zone Symbol

Tree Inventory

Refer to Table 1 of report revised 16 February 2022 for the complete tree inventory. All trees 10 cm in diameter and larger situated on subject property, in the road allowances and on neighbouring property within 6 m were included in the tree inventory.

Tree Removal

Removal of Trees 1-7, 17, 17a, 19-24, 27-29, 35-39 and 41 will be required to accommodate the proposed development.

Tree Preservation

Preservation of Trees 8-16, 18, 18a, 25, 26, 30-34, 40 and 42 will be possible with appropriate tree protection measures. Tree protection measures will have to be implemented prior to the commencement of construction to ensure trees identified for preservation are not impacted by the proposed development.

It appears that encroachment within the mTPZs of Trees 8, 10, 12, 14, 16, 18 and 18a will be required to accommodate the proposed development. The areas of encroachment are occupied by impermeable surfaces and as such there should be no impacts. If any roots are exposed during construction they must be pruned by a Certified Arborist in accordance with good arboricultural practice.

JACKSON ARBORICULTURE INC.
118 Pleasant Ridge Rd.
Brantford ON
N3R 0B8
905-512-6303
jeremy@jacksonarbor.ca

Tree Inventory and Preservation Plan

1600 Kerns Road
Burlington, ON

Project #	P207	Figure #	1
Date	March 2021 Revised February 2022		
Scale	1 : 500		

Citation: Region of Halton. 2020. Environmental Impact Assessment Guidelines

Appendix H – Impact Analysis and Mitigation Strategy

The Region of Halton Environmental Impact Assessment Guidelines (2020) categorizes environmental impacts into the following three categories:

DIRECT IMPACTS - Direct impacts occur through direct interaction of a development or site alteration and/or its associated activities with features and/or functions of the natural environment. Examples of direct impacts include tree or vegetation removal, changes in water temperature.

INDIRECT IMPACTS - Indirect impacts are generally produced away from or as a result of a complex impact pathway. The indirect impacts are also known as secondary or even third level impacts. Examples of indirect impacts include changes in wildlife habitat presence/use via vegetation or tree removal, changes in water quality as a result of temperature changes.

INDUCED IMPACTS - Induced impacts are included within indirect impacts. Induced impacts include those that are not directly associated with the development or site alteration activity but generate impacts through or as a result of growth-related changes associated with the activity or a change in land use. For example: increased traffic resulting in increased road mortality of wildlife, increased population resulting in increased recreational use which will introduce or increase the risk of new un-sanctioned trails, invasive species, off-leash animals and impacts to wildlife, etc. within the NHS.

CUMULATIVE IMPACTS - Cumulative impacts are those created as a result of the combination of the development or site alteration evaluated in the EIA together with other projects causing related impacts. An assessment of cumulative impacts considers the incremental impact of the project combined with the cumulative effects of other past (i.e., existing impacts or effects), present (i.e., current ii / in-process projects / activities) and reasonably foreseeable future projects (i.e., based on existing land use designation and any development that can be reasonably anticipated).

Environmental impacts associated with development or site alteration may be characterised as irreversible, short-term, construction related, long-term and cumulative. Examples of direct and indirect impacts that may be considered in an EIA include, but are not limited to, the following (Region of Halton 2020). Potential impacts associated with the proposed conversion of a commercial plaza to a retirement facility are highlighted with an asterisk (*)

1. Fragmentation or reduction in the size of the NHS.

2. Increase in the perimeter-to-area ratio of features within the NHS.

3. Loss of ecological features and supporting functions of agricultural lands adjacent to the NHS.

4. Alteration of natural disturbance cycles important to the ecological health and renewal of the NHS, such as flooding, erosion, deposition, disease, and fire, etc.

5. Loss or reduction in functional ecological linkage of the NHS among natural features important for daily, seasonal and/or long-term movement patterns of plants and animals.

6. *Alteration of natural topography that results in impacts to the NHS.

7. *Ongoing or increased potential for human or domestic animal impacts on the NHS, especially area sensitive species, ground-nesting birds, small mammals, reptiles and amphibians.

8. *Alteration of the quantity, quality, timing (hydroperiod) or direction of flow, of surface or ground water resulting in impacts to the NHS.

9. Alteration of the structure, functions or ecological interrelationships of natural habitat that sustains representative community associations or species populations.

10. Reductions in the size and diversity of species populations, or the health and reproductive capacity of Species.

11. Removal of vegetation communities which are structural and/or functional element of the NHS.

12. *Erosion or compaction of soils, slope failure, or deposition of sediment.

13. *Increased potential for the introduction of non-native species.

14. *Occupancy of lands adjacent to the NHS resulting in increased access, pets, night lighting, escape of horticultural plants, noise, dumping of waste, air pollution, water pollution, encroachment, increased presence of humans, etc.

15. Harmful Alteration, Disruption of Destruction (HADD) of fish habitat as defined by and pursuant to the Canada Fisheries Act; and,

16. Environmental impacts associated with aquatic environments:

- disruption or prevention of natural sediment transport regime
- severing the connection of a watercourse from its floodplain
- impairment or loss of fish passage through a watercourse
- negative changes to the health, composition, density or type of riparian vegetation
- negative changes to in-stream structure (e.g., overhanging banks, dynamic banks, hydraulic habitats that have formed over time, sand, gravel, and organic substrates)
- enclosure of watercourses in underground pipes
- excavation of on-line ponds
- excavation of off-line pond that could be a source of thermal or water quality pollution with respect to surface and/or ground water resources; and,
- the lining of the banks or channel of any watercourse with hard materials.

Impact analysis – No direct impacts are anticipated as the RNHS feature (i.e., Upper Hager Creek ravine and associated woodland) is to be protected with a minimum 7.5 m buffer from stable top of bank and generally a 10 m setback from the dripline, that will be naturalized with locally indigenous plant species. Cumulative impacts are also not anticipated as the proposed development is a conversion of an existing

developed lot (i.e., commercial plaza) to a retirement facility. The proposed development is located within the Tyandaga Neighbourhood, which is mainly residential in character, and fully built-out.

The proposed development has the potential to positively impact the RNHS through the provision of naturalized buffers (in areas that are currently either manicured lawn, parking lot, building or playground), fencing along the limit of development to keep people and companion animals out of the ravine, improved stormwater management quantity and quality controls, and reduced noise levels (i.e., day care adjacent to RNHS vs. proposed retirement home).

The proposed development however has the potential to produce some indirect (induced) impacts (as described above) through the conversion of neighbourhood commercial (non-residential) to a residential land use (retirement facility). Mitigation measures will be necessary to avoid or minimize negative impacts to RNHS features and functions.

Mitigation measures are intended to maintain the health, features, and function of the RNHS components and contribute to reducing or eliminating potential short or long-term impacts from development or site alteration on the RNHS (Region of Halton 2020). Examples of mitigation measures include the following (Region of Halton 2020). Proposed mitigation measures for 1600 Kerns Road are identified with an asterisk (*).

1. *Avoidance of natural features and functions.

2. *Modifying or redesigning the proposal to reduce or eliminate impacts.

3. Dedication or transfer of natural areas to a public body.

4. *Buffers and/or setbacks adequate to reduce impacts and preserve ecological functions along edges of natural features.

5. *Consider use of ‘living fences’ to deter access into sensitive features or areas.

6. *Measures to restore or enhance natural areas, features or functions onsite.

7. Installation of functional eco-passages for roads that cross natural areas to allow movement of resident plants and animals.

8. *Construction timing restrictions to avoid critical periods such as fish spawning, herpetofauna breeding and hibernation periods, bird breeding and nesting (May 1st to July 31st) and animal migrations and/or seasons when heavy construction equipment operating on exposed soils is most likely to cause soil erosion and siltation.

9. *Effective temporary stormwater management and sediment control during construction.

10. *Ministry of the Environment and Climate Change Enhanced permanent stormwater management facilities.

11. *Innovative infiltration measures suitable for the site such as infiltration trenches, porous pavements, catchment cisterns, etc.

12. *Proper collection of ground water elevation data that will allow proponents to design development or site alteration in a way that will mitigate impacts to groundwater.

13. For waterways currently impacted by past human alteration wherever possible make every effort to:

- "daylight" and restore waterways that currently exist in underground pipes
- remove human created impoundments that currently exist within watercourses; and,
- Rehabilitate hardened creek channels using natural channel design principles and techniques.

14. Institute strategies to reduce salt application to roads that cross or are located adjacent to waterways.

15. *Consider adoption of on-site stormwater management including green roofs.

16. *Low impact development techniques.

17. *Urban design guidelines that consider factors such as window treatments to prevent bird strikes, lighting that does not impact adjacent natural areas, street and lot orientation that provides additional separation from natural features.

18. Salvaging strategies for plants and animals that will be directly impacted by development or site alteration.

19. *Comprehensive ecological restoration plans.

20. Trail siting and design that considers ecological sensitivities and principles.

21. *Promotion of stewardship initiatives.

22. *Detailed tree saving plans developed to maximize tree saving through careful adjustment of final development or site alteration plans.

23. *Installation of temporary and permanent fencing.

24. Posting securities for environmental damage repair; and,

25. *Promotion of public awareness through the development of homeowners' guides and the creation and installation of information signage.

Mitigation Measures - Based on the above overview of potential development related impacts to the natural environment, the following mitigation measures are recommended to avoid or minimize negative impacts (indirect/induced, cumulative) to RNHS features and functions associated with the proposed development at 1600 Kerns Road. Table 1 (below) provides an outline of the recommended mitigation strategy that should be implemented as part of the proposed development.

Table 1: Recommended Mitigation and Environmental Management Measures

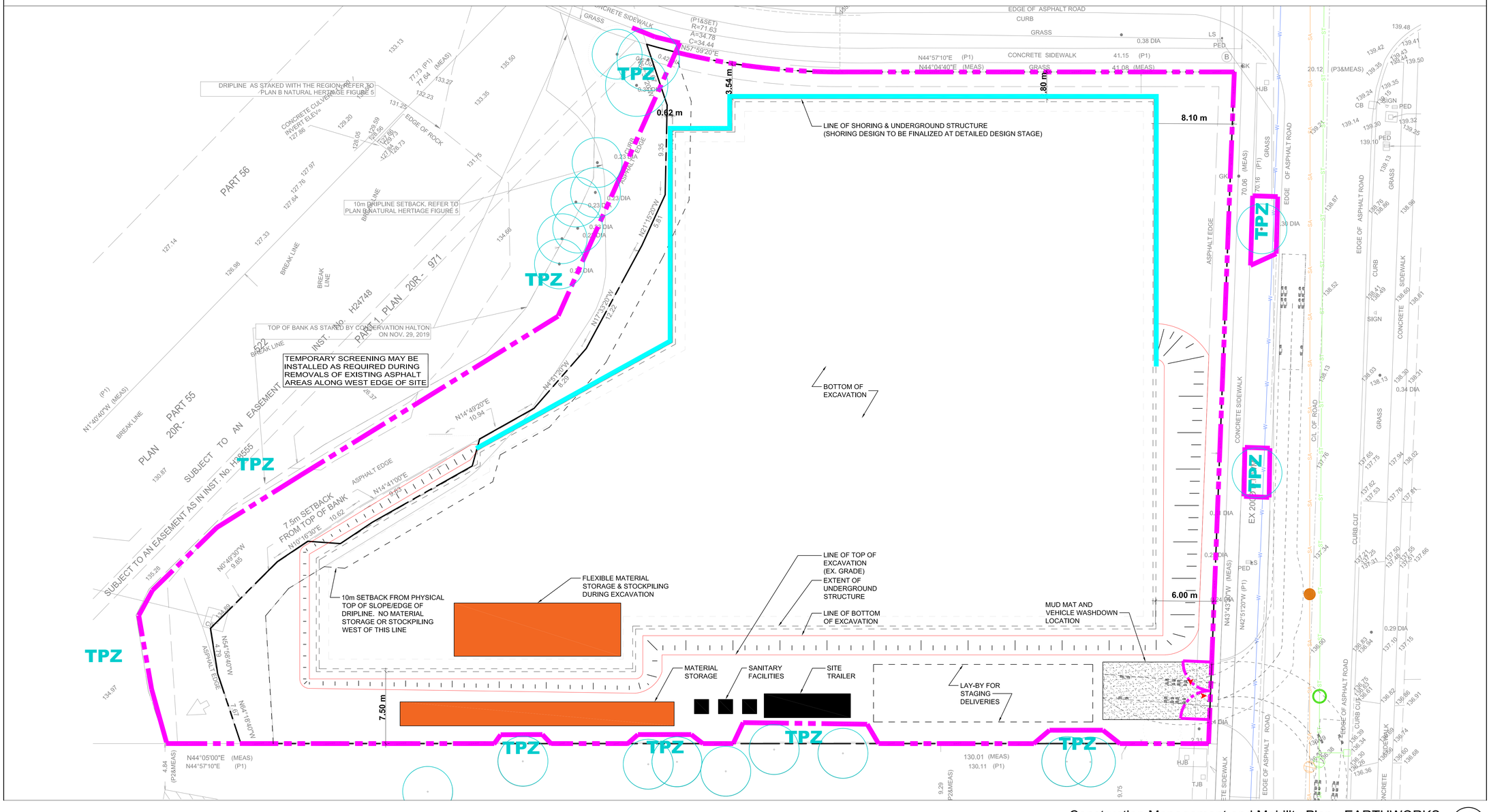
Mitigation Measure	**Action**
Stake ravine top of bank and woodland dripline with CH and Region of Halton staff.	Task completed.
Apply prescribed setbacks to stable top of bank and woodland dripline as a "framework" for the proposed development.	7.5 m stable top of bank setback provided. 10 m woodland dripline setback provided throughout the majority of the site.
Install erosion/siltation control (ESC) and tree protection measures (following CH and CoB standards) along the staked top of bank while the existing development within the 7.5 m setback is being removed, and then relocate the ESC fencing/tree protection measures to the limit of development.	Condition of site plan approval.
Regular site inspection of protective hoarding along the ravine edge during all phases of construction.	Condition of site plan approval.
Window treatments and low-level lighting to prevent bird strikes of the building.	Condition of site plan approval.
Restoration of setback and open/disturbed ravine slopes with locally indigenous plant species, as per CH Landscaping Guidelines (refer to Figure 6).	Condition of site plan approval.
Permanent fencing of the RNHS to discourage pedestrian and companion animal access.	Condition of site plan approval.
Gentle grading within the buffer to avoid erosion of ravine slope from overland sheet flow runoff.	Condition of site plan approval.
Stormwater quality/quantity controls, including LID measures, to protect Upper Hager Creek.	Condition of site plan approval.
Groundwater management measures and monitoring (during and post-construction).	Condition of site plan approval.
Performance monitoring of buffer/ravine plantings following CH Guidelines.	Condition of site plan approval.

LEGEND

- CONSTRUCTION MUDMAT WASHDOWN AREA
- MATERIAL STOCKPILING & STORAGE
- LIMIT OF CONSTRUCTION: SITE SECURITY FENCING W/ INTEGRATED SILT FENCING & TREE PROTECTION (6'-0" CONSTRUCTION FENCING)
- SHORING (REFER TO SHORING DRAWING)
- ENTRANCE GATE

NOTES

1) AS NOTED BY CITY OF BURLINGTON CAPITAL WORKS, "ALL ELEMENTS OF THE UNDERGROUND PARKING STRUCTURE (I.E. WALLS, FOUNDATION DRAINS, SHORING, ETC.) ARE REQUIRED TO BE WITHIN THE LIMITS OF THE SUBJECT PROPERTY"
   i. ALL PERMANENT AND TEMPORARY STRUCTURES ARE WITHIN PROPERTY LINES, TEMPORARY SHORING WILL NOT ENTER R.O.W. AND WILL BE CANTILEVERED OR USE INTERNAL RAKERS. REFER TO PRELIMINARY SHORING DRAWINGS
   ii. WHERE SHORING IS NOT REQUIRED (SOUTHERN HALF OF SITE, AS EX. GRADE LOWERS MOVING SOUTHWARD) SLOPING AT THE PERIMETER OF THE EXCAVATION WILL ALSO BE REMAIN WITHIN THE PROPERTY LINES
2) CLOSURES: NO PERMANENT LANE OR SIDEWALK CLOSURES ARE ANTICIPATED FOR DURATION OF CONSTRUCTION. TEMPORARY BOOK 7 CLOSURES WOULD BE REQUIRED FOR UTILITY CONNECTIONS ON KERNS ROAD AND SIDEWALK.
3) ENCROCHMENTS: NO TEMPORARY OR PERMANENT ENCROACHMENTS ARE ANTICIPATED WITH PRIVATE PROPERTIES OR CITY ROW INCLUDING SHORING AND FORMWORK.
4) HAUL ROUTES: ALL TRAFFIC TO BE DIRECTED AS FOLLOWS:
   - SOUTH ON KERNS ROAD TO NORTH SERVICE ROAD
   - FOR EB/NB 407: EAST ON NORTH SERVICE ROAD, NORTH ON GUELPH LINE, EAST ON DUNDAS STREET TO ON RAMP.
   - FOR EASTBOUND & WESTBOUND 403/QEW: EAST ON NORTH SERVICE ROAD, SOUTH ON BRANT STREET TO ON RAMPS.
   - FOR SOUTHBOUND QEW: WEST ON NORTH SERVICE ROAD, SOUTH ON KING ROAD, EAST ON PLAINES RD E TO ON RAMP.
6) ARRANGEMENTS FOR TRUCK STACKING AND TRADES PARKING TO BE ME WITH OFF SITE LOTS/YARDS. NO TRUCK STACKING AND TRADES PARKING TO BE PERMITTED ON PUBLIC ROADS
7) CONSTRUCTION SEQUENCING: START DATE TBD
   - SHORING & EARTHWORKS: 2 MONTHS
   - FOUNDATION: 4 MONTHS
   - SUPERSTRUCTURE & INTERIOR: 16 MONTHS
   - SURFACE/SITEWORKS: 2 MONTHS
   - NOTE: TEMP CLOSURES FOR UTILITY WORKS WILL BE LIMITED, COMPLETE SCOPE TO BE CONFIRMED UPON DETAILED DESIGN
8) CRANE LOCATION & RADIUS - LOCATION AND RADIUS INDICATED ON SURFACE WORKS PLAN
9) CONSTRUCTION STAGING: NO CONSTRUCTION STAGING ANTICIPATED ON CITY RIGHT OF WAY. STAGING AREAS ARE ALL WITHIN THE SITE LIMITS.
10) NO TEMPORARY OR PERMANENT ASSET REMOVALS ARE REQUIRED FOR THIS WORK.
11) BURLINGTON HYDRO TO PROVIDE CONSULTATION ON ENGERGIZATION REQUIREMENTS
12) UNION GAS (ENBRIDGE GAS) HAS BEEN CONTACTED AND EXPRESSED NO CONCERNS FOR FUTURE DEVELOPMENT
13) PER CITY OF BURLINGTON CAPITAL WORKS, PRECONDITION SURVEY OF AREA BUILDINGS PRIOR TO START OF EXCAVATION AND VIBRATION MONITORING FOR THE DURATION OF CONSTRUCTION, WILL BE REQUIRED, LIMITS OF STUDY AREA TO BE DETERMINED.
14) DEWATERING SYSTEM: DESIGN TO ALIGN WITH HYDROGEOLOGICAL ASSESSMENT REPORT TO ACCOMMODATE CONSTRUCTION DEWATERING RATES, EQUIPMENT SIZING TO BE CONFIRMED UPON DETAILED DESIGN WITH FINAL ELEVATION CONSIDERATIONS. FILTRATION OR DECANTATION FACILITIES OR SIMILAR WILL BE USED TO CONTROL TSS AND ASSOCIATED METALS DURING CONSTRUCTION DEWATERING TO DISCHARGE TO THE APPLICABLE SEWER SYSTEM AND TO COMPLY WITH APPLICABLE STORM & SANITARY DISCHARGE BY-LAWS. HYDROG CONSULTANT WILL PROVIDE FURTHER ANALYSIS AS REQUIRED UPON DETAILED DESIGN.
15) ALL CURRENT PARKING PROHIBITIONS TO REMAIN ON KERNS ROAD. FURTHER, NO STOPPING ANYTIME 60m NORTH AND SOUTH ON FOUR SEASONS DRIVE & KERNS ROAD



Construction Management and Mobility Plan - EARTHWORKS

Scale: 1 : 200

1 CMMP1

Plot Date:

File Path:

No.:	Revision:	Date:

No :	Issued For:	Date:

Drawing Title:

Construction Management and Mobility Plan EARTHWORKS

Project:

FIELDGATE PROPERTIES

1600 KERNS RETIREMENT HOME

1600 KERNS ROAD, BURLINGTON, ON

Scale:	1 : 200
Drawn by:	J.D.
Checked by:	J.D.
Project No.:	1600K
Date:	22/02/24

Drawing No.:

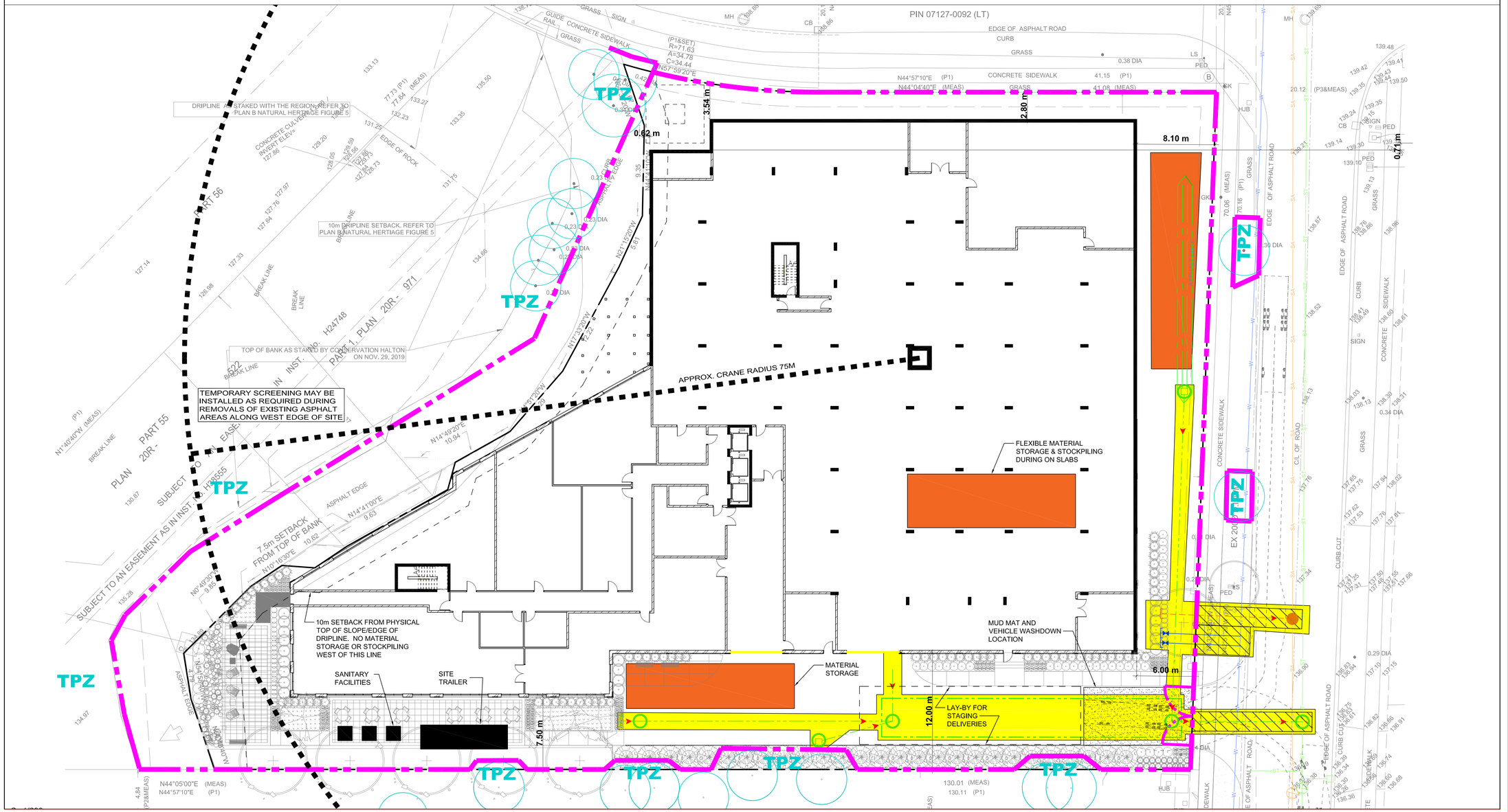
CMMP1

LEGEND

- LIMIT OF CONSTRUCTION: SITE SECURITY FENCING W/ INTEGRATED SILT FENCING & TREE PROTECTION (6'-0" CONSTRUCTION FENCING)
- PROPOSED SERVICES
- MATERIAL STORAGE
- CONSTRUCTION MUDMAT WASHDOWN AREA
- TOWER CRANE/SWING
- UTILITIES TEMP ROAD CLOSURES
- ENTRANCE GATE

NOTES

1) AS NOTED BY CITY OF BURLINGTON CAPITAL WORKS, "ALL ELEMENTS OF THE UNDERGROUND PARKING STRUCTURE (I.E. WALLS, FOUNDATION DRAINS, SHORING, ETC.) ARE REQUIRED TO BE WITHIN THE LIMITS OF THE SUBJECT PROPERTY"
   i. ALL PERMANENT AND TEMPORARY STRUCTURES ARE WITHIN PROPERTY LINES, TEMPORARY SHORING WILL NOT ENTER R.O.W. AND WILL BE CANTILEVERED OR USE INTERNAL RAKERS. REFER TO PRELIMINARY SHORING DRAWINGS
   ii. WHERE SHORING IS NOT REQUIRED (SOUTHERN HALF OF SITE, AS EX. GRADE LOWERS MOVING SOUTHWARD) SLOPING AT THE PERIMETER OF THE EXCAVATION WILL ALSO BE REMAIN WITHIN THE PROPERTY LINES
2) CLOSURES: NO PERMANENT LANE OR SIDEWALK CLOSURES ARE ANTICIPATED FOR DURATION OF CONSTRUCTION. TEMPORARY BOOK 7 CLOSURES WOULD BE REQUIRED FOR UTILITY CONNECTIONS ON KERNS ROAD AND SIDEWALK.
3) ENCROCHMENTS: NO TEMPORARY OR PERMANENT ENCROACHMENTS ARE ANTICIPATED WITH PRIVATE PROPERTIES OR CITY ROW INCLUDING SHORING AND FORMWORK.
4) HAUL ROUTES: ALL TRAFFIC TO BE DIRECTED AS FOLLOWS:
   - SOUTH ON KERNS ROAD TO NORTH SERVICE ROAD
   - FOR EB/NB 407: EAST ON NORTH SERVICE ROAD, NORTH ON GUELPH LINE, EAST ON DUNDAS STREET TO ON RAMP.
   - FOR EASTBOUND & WESTBOUND 403/QEW: EAST ON NORTH SERVICE ROAD, SOUTH ON BRANT STREET TO ON RAMPS.
   - FOR SOUTHBOUND QEW: WEST ON NORTH SERVICE ROAD, SOUTH ON KING ROAD, EAST ON PLAINES RD E TO ON RAMP.
6) ARRANGEMENTS FOR TRUCK STACKING AND TRADES PARKING TO BE ME WITH OFF SITE LOTS/YARDS. NO TRUCK STACKING AND TRADES PARKING TO BE PERMITTED ON PUBLIC ROADS
7) CONSTRUCTION SEQUENCING: START DATE TBD
   - SHORING & EARTHWORKS: 2 MONTHS
   - FOUNDATION: 4 MONTHS
   - SUPERSTRUCTURE & INTERIOR: 16 MONTHS
   - SURFACE/SITEWORKS: 2 MONTHS
   - NOTE: TEMP CLOSURES FOR UTILITY WORKS WILL BE LIMITED, COMPLETE SCOPE TO BE CONFIRMED UPON DETAILED DESIGN
8) CRANE LOCATION & RADIUS - LOCATION AND RADIUS INDICATED ON SURFACE WORKS PLAN
9) CONSTRUCTION STAGING: NO CONSTRUCTION STAGING ANTICIPATED ON CITY RIGHT OF WAY. STAGING AREAS ARE ALL WITHIN THE SITE LIMITS.
10) NO TEMPORARY OR PERMANENT ASSET REMOVALS ARE REQUIRED FOR THIS WORK.
11) BURLINGTON HYDRO TO PROVIDE CONSULTATION ON ENGERGIZATION REQUIREMENTS
12) UNION GAS (ENBRIDGE GAS) HAS BEEN CONTACTED AND EXPRESSED NO CONCERNS FOR FUTURE DEVELOPMENT
13) PER CITY OF BURLINGTON CAPITAL WORKS, PRECONDITION SURVEY OF AREA BUILDINGS PRIOR TO START OF EXCAVATION AND VIBRATION MONITORING FOR THE DURATION OF CONSTRUCTION, WILL BE REQUIRED, LIMITS OF STUDY AREA TO BE DETERMINED.
14) DEWATERING SYSTEM: DESIGN TO ALIGN WITH HYDROGEOLOGICAL ASSESSMENT REPORT TO ACCOMMODATE CONSTRUCTION DEWATERING RATES, EQUIPMENT SIZING TO BE CONFIRMED UPON DETAILED DESIGN WITH FINAL ELEVATION CONSIDERATIONS. FILTRATION OR DECANTATION FACILITIES OR SIMILAR WILL BE USED TO CONTROL TSS AND ASSOCIATED METALS DURING CONSTRUCTION DEWATERING TO DISCHARGE TO THE APPLICABLE SEWER SYSTEM AND TO COMPLY WITH APPLICABLE STORM & SANITARY DISCHARGE BY-LAWS. HYDROG CONSULTANT WILL PROVIDE FURTHER ANALYSIS AS REQUIRED UPON DETAILED DESIGN.
15) ALL CURRENT PARKING PROHIBITIONS TO REMAIN ON KERNS ROAD. FURTHER, NO STOPPING ANYTIME 60m NORTH AND SOUTH ON FOUR SEASONS DRIVE & KERNS ROAD



Construction Management and Mobility Plan - SURFACE

Scale: 1 : 200

1 CMMP2

Plot Date:

File Path:

No.:	Revision:	Date:

No :	Issued For:	Date:

Drawing Title:

Construction Management and Mobility Plan SURFACE

Project:

FIELDGATE PROPERTIES

1600 KERNS RETIREMENT HOME

1600 KERNS ROAD, BURLINGTON, ON

Scale:	1 : 200
Drawn by:	J.D.
Checked by:	J.D.
Project No.:	1600K
Date:	22/02/24

Drawing No.:

CMMP2

Legend

- Property Boundary
- Watercourse

N

0 5 10 20 30 Meters

PLAN B Natural Heritage
Landscape Ecology & Natural Heritage Planning
176 Fellowes Crescent
Waterdown, ON
L0R 2H3

1600 Kerns Road EIA
City of Burlington
Study Area

Project #	2019-184	Figure # 1a
Date	February 2022	
Scale	1 : 750	
Prepared By: JJJ	Verified By: BDB	

Legend

- Property Boundary
- Watercourse
- Contour Line (0.25 m intervals)
- Dripline (as staked with the Region)
- Top-of-bank (as staked by CH)
- 10 m Dripline Setback
- 7.5 m Stable Top of Slope Setback

N

0 5 10 20 30 Meters

PLAN B Natural Heritage
Landscape Ecology & Natural Heritage Planning
176 Fellowes Crescent
Waterdown, ON
L0R 2H3

1600 Kerns Road EIA
City of Burlington
Study Area

Project #	2019-184	Figure # 1b
Date	February 2022	
Scale	1 : 750	
Prepared By: JJJ	Verified By: BDB	

Legend

- Property Boundary
- Watercourse
- Vegetation Community Boundary

Vegetation Communities (ELC Units)

- FOD — Deciduous Forest
- FOD4-2 — Dry-Fresh White Ash Deciduous Forest Type
- FOD6-1 — Fresh-Moist Sugar Maple – Lowland Ash Deciduous Forest Type
- FOD5-11 — Dry-Fresh Sugar Maple – Hardwood Deciduous Forest Type
- ORN/DIS — Ornamental/Disturbed*

*This type is not in ELC (Lee et al. 1998).

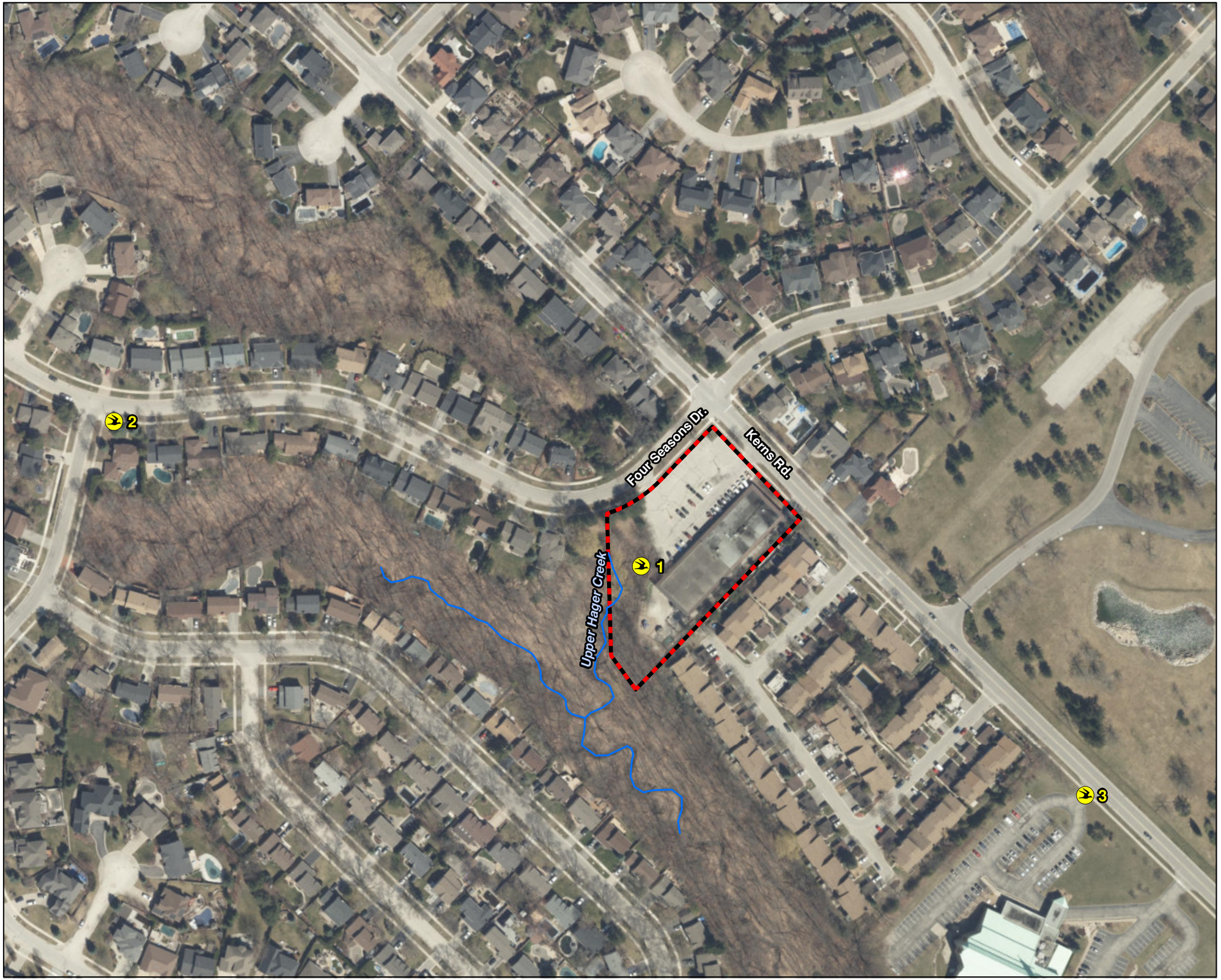
N

0 5 10 20 30 Meters

PLAN B Natural Heritage
Landscape Ecology & Natural Heritage Planning
176 Fellowes Crescent
Waterdown, ON
L0R 2H3

1600 Kerns Road EIA
City of Burlington
Ecological Land Classification

Project #	2019-184	Figure # 2
Date	February 2022	
Scale	1 : 750	
Prepared By: JJJ	Verified By: BDB	



Legend

- Property Boundary
- Watercourse
- Breeding Bird Point Count Location 2020

N

0 12.5 25 50 75 Meters

PLAN B Natural Heritage
Landscape Ecology & Natural Heritage Planning
176 Fellowes Crescent
Waterdown, ON
L0R 2H3

1600 Kerns Road EIA
City of Burlington
Wildlife Monitoring

Project #	2019-184	Figure # 3
Date	February 2022	
Scale	1 : 2,000	
Prepared By: JJJ	Verified By: BDB	

Legend

- Property Boundary
- Watercourse
- Dripline (as staked with the Region)
- Top-of-bank (as staked by CH)
- 10 m Dripline Setback
- 7.5 m Stable Top of Slope Setback

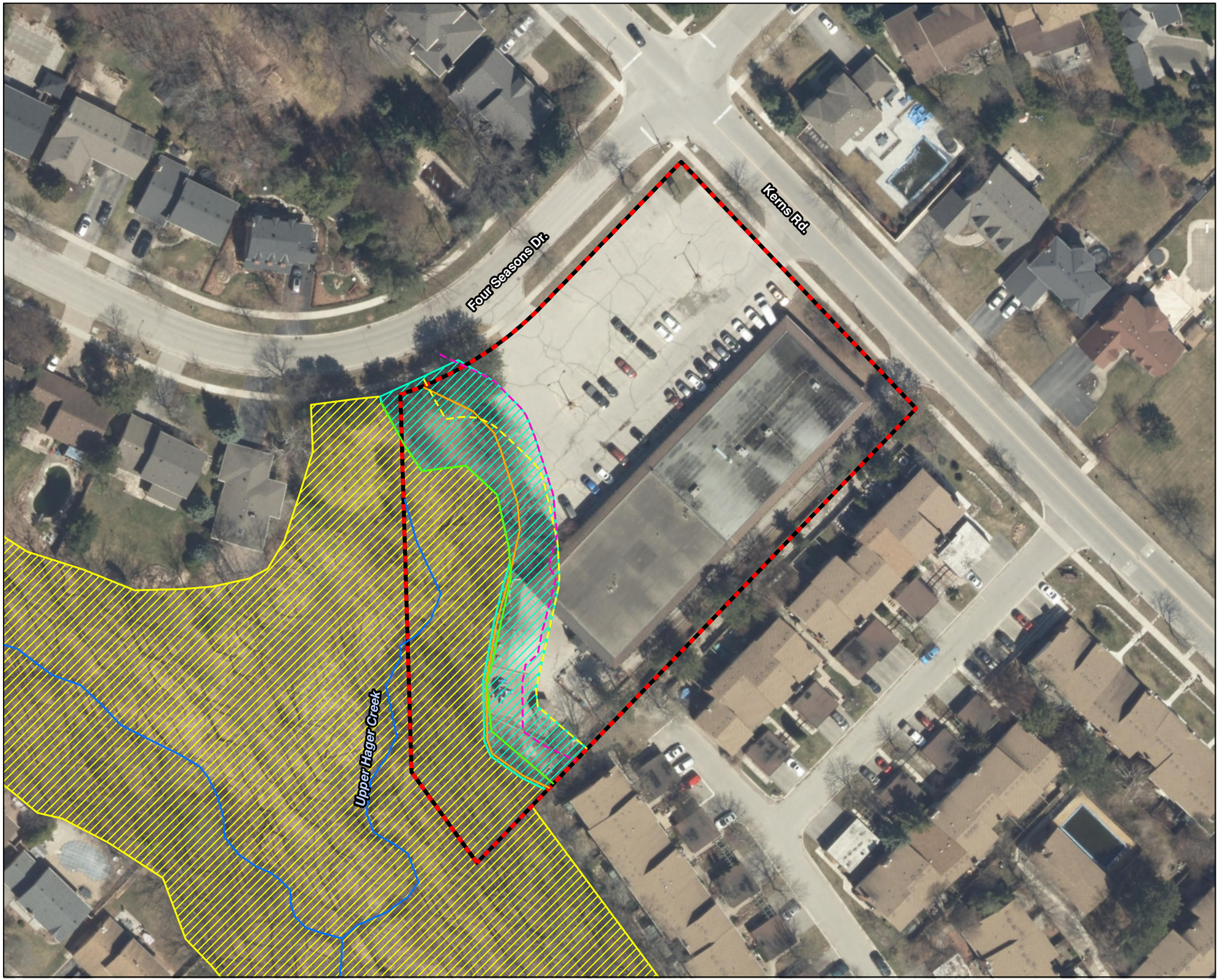
N

0 5 10 20 30 Meters

PLAN B Natural Heritage
Landscape Ecology & Natural Heritage Planning
176 Fellowes Crescent
Waterdown, ON
L0R 2H3

1600 Kerns Road EIA
City of Burlington
Environmental Constraints

Project #	2019-184	Figure # 4
Date	February 2022	
Scale	1 : 750	
Prepared By: JJJ	Verified By: BDB	



Legend

- Property Boundary
- CH Regulated Watercourse
- Dripline (as staked with the Region)
- Stable Top-of-bank (as staked by CH)
- 10 m Woodland Setback
- 7.5 m Stable Top-of-bank Setback
- Significant Woodland (Region of Halton)
- Significant Wildlife Habitat (PPS)
- Valleyland/Woodland Buffer

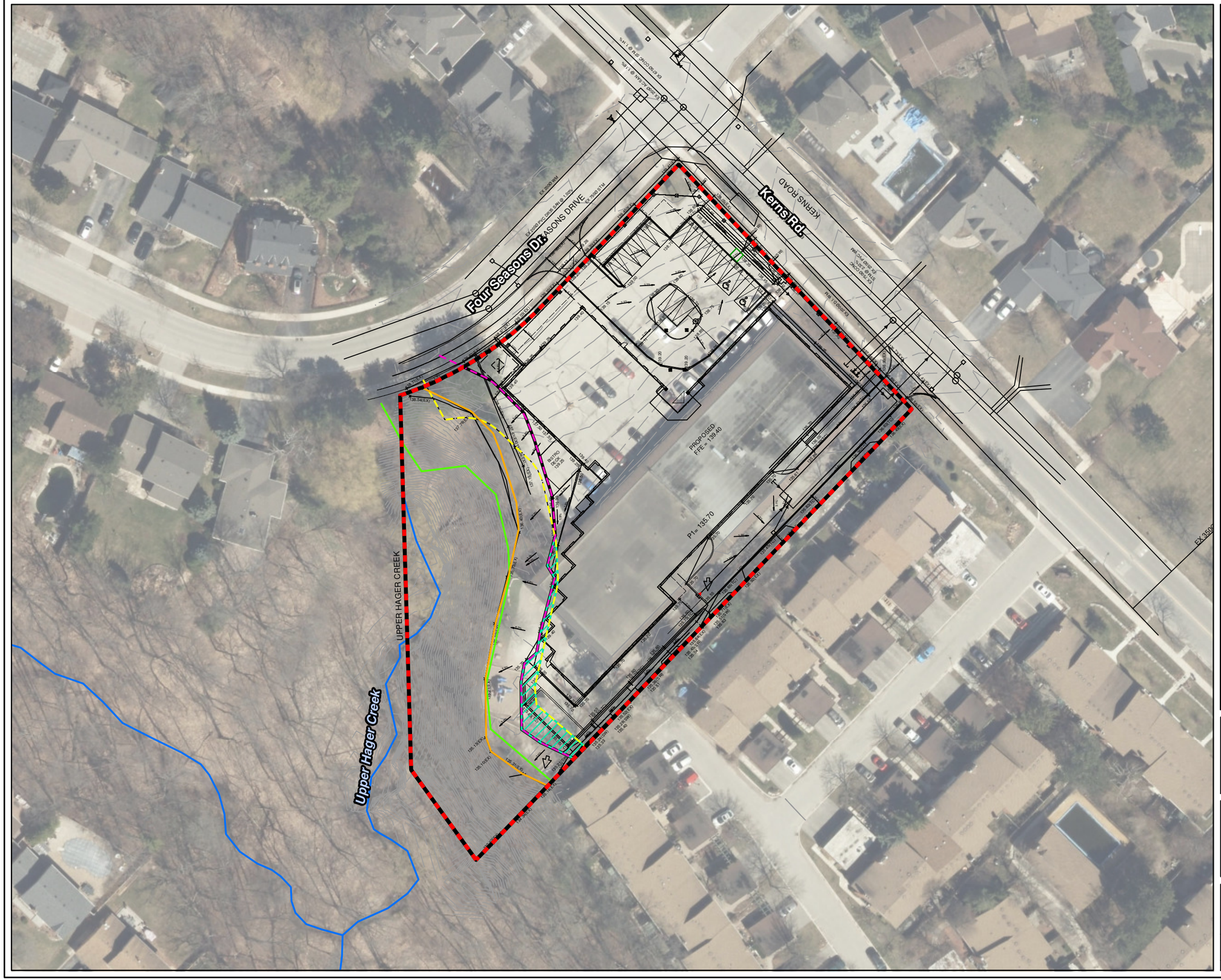
N

0 5 10 20 30 Meters

PLAN B Natural Heritage
Landscape Ecology & Natural Heritage Planning
176 Fellowes Crescent
Waterdown, ON
L0R 2H3

1600 Kerns Road EIA
City of Burlington
Key Features & Components of the RNHS

Project #	2019-184	Figure # 4a
Date	February 2022	
Scale	1 : 750	
Prepared By: JJJ	Verified By: BDB	



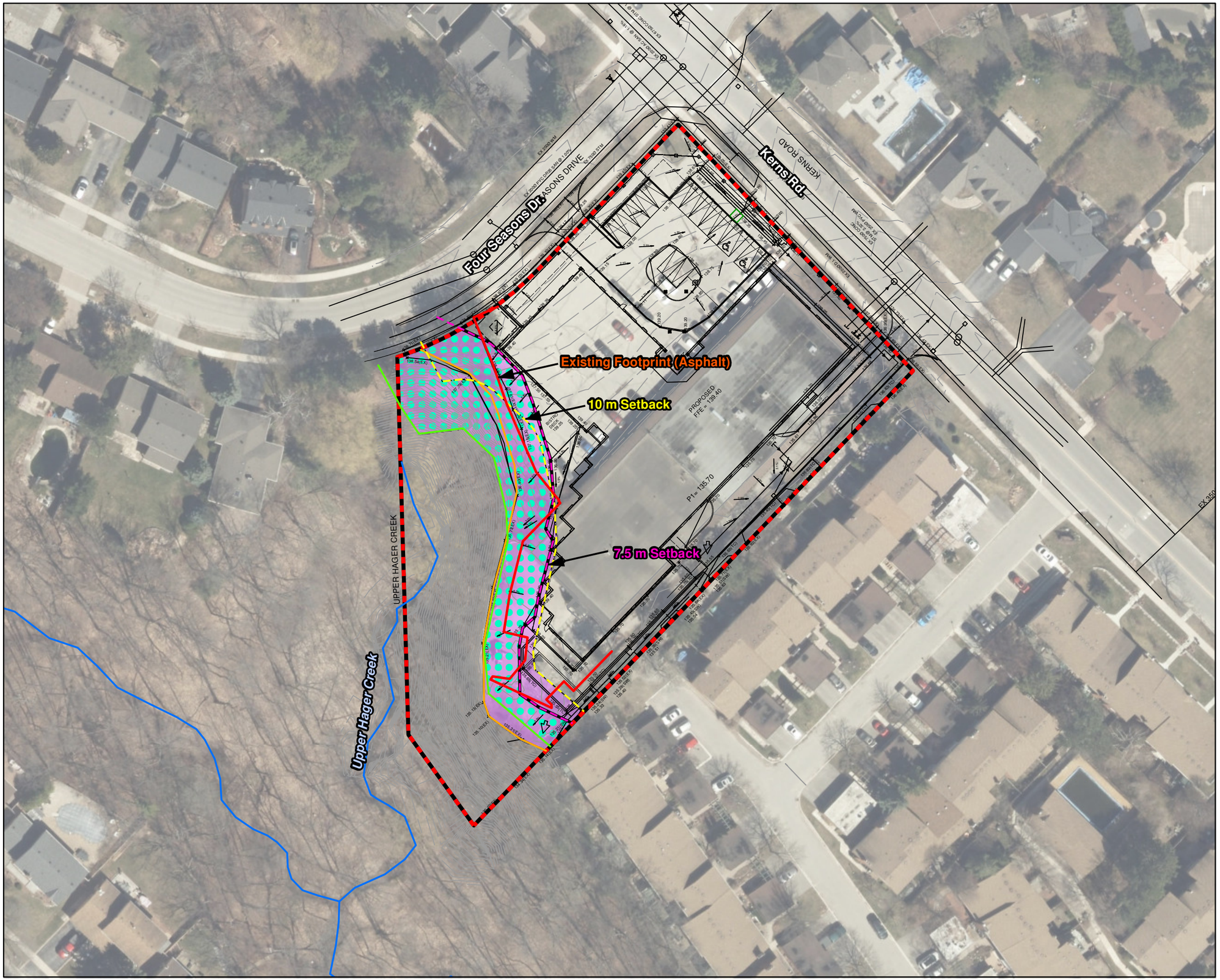
Legend

- Property Boundary
- Watercourse
- Dripline (as staked with the Region)
- Top-of-bank (as staked by CH)
- 10 m Dripline Setback
- 7.5 m Stable Top of Slope Setback
- Buffer Interference (129 m^2)

PLAN B Natural Heritage
Landscape Ecology & Natural Heritage Planning
176 Fellowes Crescent
Waterdown, ON
L0R 2H3

1600 Kerns Road EIA
City of Burlington
Site Plan

Project #	2019-184	**Figure #** 5
Date	February 2022	
Scale	1 : 750	
Prepared By: JJJ	Verified By: BDB	



Legend

- Property Boundary
- Watercourse
- Dripline (as staked with the Region)
- Top-of-bank (as staked by CH)
- 10 m Dripline Setback
- 7.5 m Stable Top of Slope Setback
- Exsiting Footprint (Asphalt)
- Total Combined Buffer (1252 m^2)
- Restored Buffer and Valley Slope (1028 m^2)

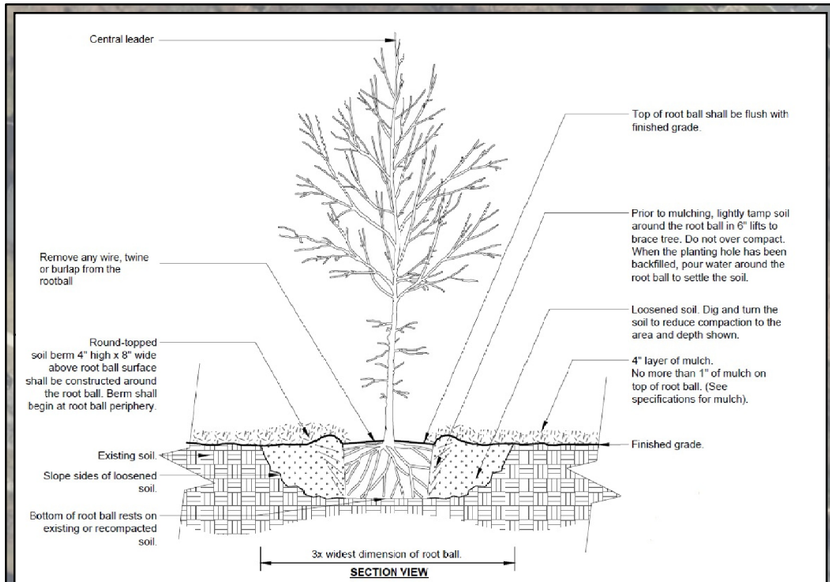
N

0 5 10 20 30 Meters

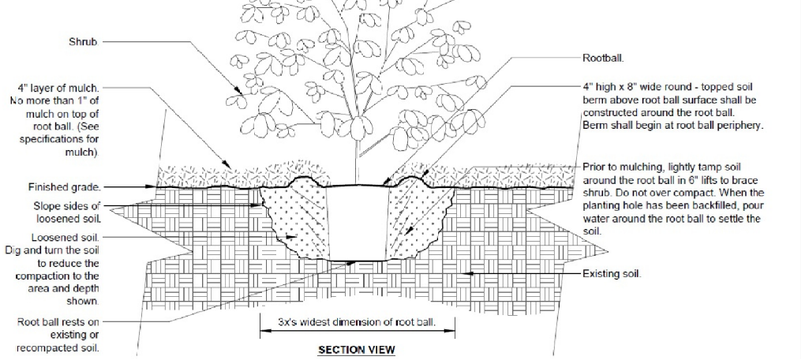
PLAN B Natural Heritage
Landscape Ecology & Natural Heritage Planning
176 Fellowes Crescent
Waterdown, ON
L0R 2H3

1600 Kerns Road EIA
City of Burlington
Site Plan

Project #	2019-184	**Figure #** 5a
Date	February 2022	
Scale	1 : 750	
Prepared By: JJJ	Verified By: BDB	



P-X TREE w/ BERM (EXISTING SOIL NOT MODIFIED)



P-X SHRUB - UNMODIFIED SOIL

Planting Schedule

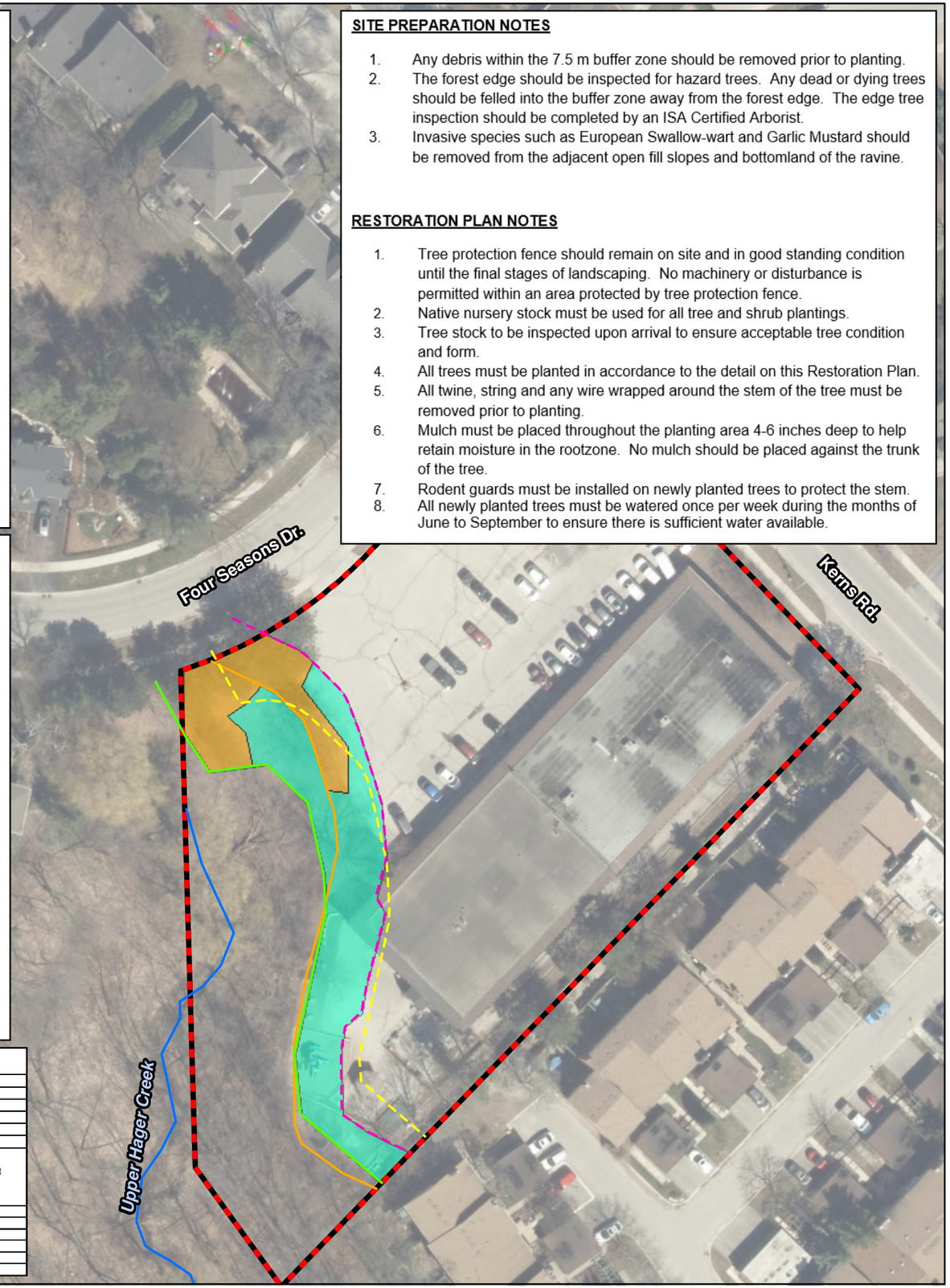
Area	Type	Species Name	Quantity	Condition	Spacing	Density	Notes
A	Shrub	Smooth Serviceberry (*Amelanchier laevis*)	30	1 Gallon Pot	0.75-1.5 m OC	50 shrubs/ 100m^2	Plant in clusters of 3-5
		Nannyberry (*Viburnum lentago*)	30	1 Gallon Pot	0.75-1.5 m OC		Plant in clusters of 3-5
		Maple-leaved Viburnum (*Virburnum acerifolium*)	28	1 Gallon Pot	0.75-1.5 m OC		Plant in clusters of 3-5
		Red Elderberry (*Sambucus racemosa spp. pubens*)	30	1 Gallon Pot	0.75-1.5 m OC		Plant in clusters of 3-5
		American Which-hazel (*Hamamelis virginiana*)	30	1 Gallon Pot	0.75-1.5 m OC		Plant in clusters of 3-5
B	Tree	Sugar Maple (*Acer saccharum*)	14	Whip - Potted	2.5-5 m OC	10 trees/ 100m^2	Plant individually throughout restoration area B
		White Oak (*Quercus alba*)	15	Whip - Potted	2.5-5 m OC		
		Black Walnut (*Juglans nigra*)	14	Whip - Potted	2.5-5 m OC		
		Trembling Aspen (*Populus tremuloides*)	15	Whip - Potted	2.5-5 m OC		
		White Pine (*Pinus strobus*)	15	Whip - Potted	2.5-5 m OC		
	Shrub	Smooth Serviceberry (*Amelanchier laevis*)	65	1 Gallon Pot	0.75-1.5 m OC	50 shrubs/ 100m^2	Plant in clusters of 3-5
		Maple-leaved Viburnum (*Virburnum acerifolium*)	55	1 Gallon Pot	0.75-1.5 m OC		Plant in clusters of 3-5
		Red Elderberry (*Sambucus racemosa*)	65	1 Gallon Pot	0.75-1.5 m OC		Plant in clusters of 3-5
		Grey Dogwood (*Cornus racemosa*)	55	1 Gallon Pot	0.75-1.5 m OC		Plant in clusters of 3-5
		Nannyberry (*Viburnum lentago*)	65	1 Gallon Pot	0.75-1.5 m OC		Plant in clusters of 3-5
		American Which-hazel (*Hamamelis virginiana*)	60	1 Gallon Pot	0.75-1.5 m OC		Plant in clusters of 3-5

SITE PREPARATION NOTES

1. Any debris within the 7.5 m buffer zone should be removed prior to planting.
2. The forest edge should be inspected for hazard trees. Any dead or dying trees should be felled into the buffer zone away from the forest edge. The edge tree inspection should be completed by an ISA Certified Arborist.
3. Invasive species such as European Swallow-wart and Garlic Mustard should be removed from the adjacent open fill slopes and bottomland of the ravine.

RESTORATION PLAN NOTES

1. Tree protection fence should remain on site and in good standing condition until the final stages of landscaping. No machinery or disturbance is permitted within an area protected by tree protection fence.
2. Native nursery stock must be used for all tree and shrub plantings.
3. Tree stock to be inspected upon arrival to ensure acceptable tree condition and form.
4. All trees must be planted in accordance to the detail on this Restoration Plan.
5. All twine, string and any wire wrapped around the stem of the tree must be removed prior to planting.
6. Mulch must be placed throughout the planting area 4-6 inches deep to help retain moisture in the rootzone. No mulch should be placed against the trunk of the tree.
7. Rodent guards must be installed on newly planted trees to protect the stem.
8. All newly planted trees must be watered once per week during the months of June to September to ensure there is sufficient water available.



Legend

- Property Boundary
- Watercourse
- Dripline (as staked with the Region)
- Top-of-bank (as staked by CH)
- 10 m Dripline Setback
- 7.5 m Stable Top of Slope Setback
- Restoration Area A - Shrubs (295 m^2)
- Restoration Area B - Trees & Shrubs (732 m^2)

Note: Completed in accordance with Conservation Halton's Landscaping and Tree Preservation Guidelines

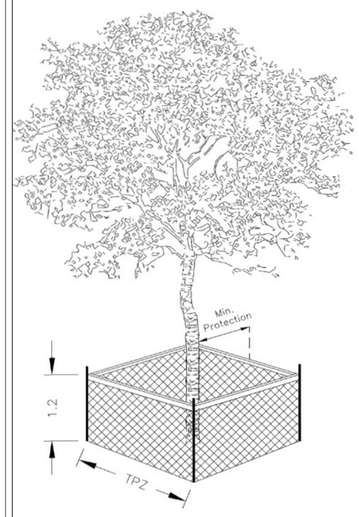
N

0 5 10 20 30 Meters

PLAN B Natural Heritage
Landscape Ecology & Natural Heritage Planning
176 Fellowes Crescent
Waterdown, ON
L0R 2H3

1600 Kerns Road EIA
City of Burlington
Restoration Plan

Project #	2019-184	Figure # 6
Date	February 2022	
Scale	1 : 750	
Prepared By: JJJ	Verified By: BDB	



Detail TP-1 – Tree Protection Detail.

Trunk Diameter (DBH) [2]	Minimum Tree Protection Zone (MTPZ) Distances Required [3]	Critical Root Zone (CRZ) Distances Required [3&4]
< 10 cm	1.8 m	1.8 m
11 - 40 cm	2.4 m	4.0 m
41 - 50 cm	3.0 m	5.0 m
51 - 60 cm	3.6 m	6.0 m
61 - 70 cm	4.2 m	7.0 m
71 - 80 cm	4.8 m	8.0 m
81 - 90 cm	5.4 m	9.0 m
91 - 100+ cm	6.0 m	10.0 m

NOTES:

[1] The roots of a tree can extend from the trunk to approximately 2-3 times the distance of the drip line.
[2] Diameter at breast height (DBH) is the measurement of tree trunk taken at 1.4 metres above ground.
[3] Minimum Tree Protection Zone and Critical Root Zone distances are to be measured from the outside edge of the tree base towards the drip line and may be limited by an existing paved surface, provided the existing paved surface remains intact throughout the construction work and is subject to Section 6 of this specification.
[4] Where work is being performed beyond the Minimum Tree Protection Zone but within the Critical Root Zone the works are subject to Section 8 of this specification.

TREE PROTECTION BARRIER

1. The required barrier is a 1.2 metre (4 ft) high orange plastic web snow fencing on 2" x 4" frame. Where orange plastic web snow fencing creates a restriction to sightlines, page wire fencing with reflective tape can be used.
2. Tree protection barriers are to be erected prior to the commencement of any construction or grading activities on the site and are to remain in place throughout the entire duration of the project. The barriers shall be maintained erect and in good repair throughout the duration of construction operations with breaks and unsupported sections repaired immediately. Tree protection may be not be removed prior to the completion of construction without written authorization from the City Arborist.
3. All supports and bracing used to safely secure the barrier should be located outside the MTPZ. All supports and bracing should minimize damage to roots.
4. Where some fill or excavated material must be temporarily located near a MTPZ, a wooden barrier with silt fencing must be used to ensure no material enters the MTPZ.
5. No materials or fill may be stored within the MTPZ.
6. Equipment or vehicles shall not be operated, parked, repaired, or refueled within the MTPZ.
7. No construction activity, grade changes, surface treatment or excavations of any kind is permitted within the MTPZ without written authorization from the City Arborist.
8. A laminated Minimum Tree Protection Zone sign (See Detail TP-3 – Minimum Tree Protection Zone Sign) must be attached to the side of the Tree Protection where it will be visible by persons entering the site. Minimum size must be 10"x14".

Burlington

TREE PROTECTION ZONE (TPZ)

No equipment or vehicles shall be operated, parked, repaired or refueled within the Tree Protection Zone.

No construction activity, grade changes, surface treatment or excavations of any kind is permitted within the Tree Protection Zone.

No materials or fill may be stored within the Tree Protection Zone.

This tree protection barrier must not be removed prior to the completion of construction without written authorization from the City of Burlington, Urban Forestry Department.

For information, contact:
City of Burlington, Development and Infrastructure Division,
905-335-7642.

Detail TP-3 – Minimum Tree Protection Zone Sign

TREE PROTECTION PLAN NOTES

Prior to site disturbance the owner must confirm that no migratory birds are making use of the site for nesting. The owner must ensure that the works are in conformance with the Migratory Bird Convention Act and that no migratory bird nests will be impacted by the proposed work. It is the applicants' responsibility to discuss potential tree injury of trees on shared property lines with their neighbours. Should such trees be injured to the point of instability or death the applicant may be held responsible for removal and such issues would be dealt with in civil court or through negotiation.

TREE PROTECTION ZONE: No construction activity including grade changes, surface treatments or excavations of any kind is permitted within the area identified on the Tree Protection Plan or Site Plan as a Tree Protection Zone (TPZ). No root cutting is permitted. No storage of materials or fill is permitted within the TPZ. No movement or storage of vehicles or equipment is permitted within the TPZ. Grade changes are not permitted within established TPZ. The area(s) identified as a TPZ must remain undisturbed at all times.

TREE PROTECTION BARRIERS:

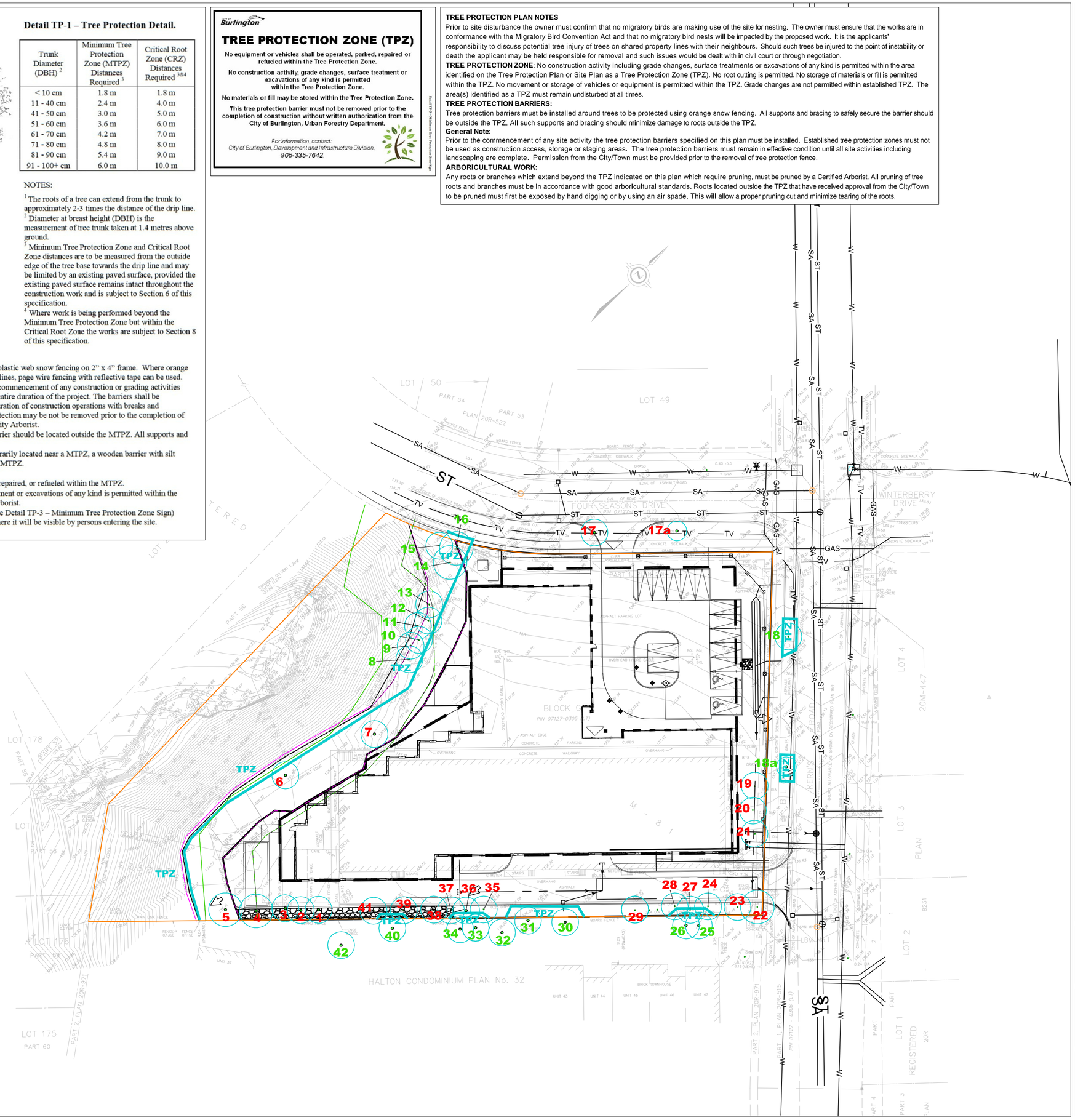
Tree protection barriers must be installed around trees to be protected using orange snow fencing. All supports and bracing to safely secure the barrier should be outside the TPZ. All such supports and bracing should minimize damage to roots outside the TPZ.

General Note:

Prior to the commencement of any site activity the tree protection barriers specified on this plan must be installed. Established tree protection zones must not be used as construction access, storage or staging areas. The tree protection barriers must remain in effective condition until all site activities including landscaping are complete. Permission from the City/Town must be provided prior to the removal of tree protection fence.

ARBORICULTURAL WORK:

Any roots or branches which extend beyond the TPZ indicated on this plan which require pruning, must be pruned by a Certified Arborist. All pruning of tree roots and branches must be in accordance with good arboricultural standards. Roots located outside the TPZ that have received approval from the City/Town to be pruned must first be exposed by hand digging or by using an air spade. This will allow a proper pruning cut and minimize tearing of the roots.



Legend

- Surveyed Tree Location
- GPS Tree Location
- Minimum Tree Preservation Zone (for planning purposes only)
- Tree Preservation Fencing Location
- Property Boundary
- Staked Dripline
- Top of Bank
- 7.5 m Top of Bank Setback
- 10 m Dripline Setback
- 15 — Tree Identified for Preservation
- 28 — Tree Identified for Removal
- TPZ — Tree Preservation Zone Symbol

Tree Inventory

Refer to Table 1 of report revised 16 February 2022 for the complete tree inventory. All trees 10 cm in diameter and larger situated on subject property, in the road allowances and on neighbouring property within 6 m were included in the tree inventory.

Tree Removal

Removal of Trees 1-7, 17, 17a, 19-24, 27-29, 35-39 and 41 will be required to accommodate the proposed development.

Tree Preservation

Preservation of Trees 8-16, 18, 18a, 25, 26, 30-34, 40 and 42 will be possible with appropriate tree protection measures. Tree protection measures will have to be implemented prior to the commencement of construction to ensure trees identified for preservation are not impacted by the proposed development.

It appears that encroachment within the mTPZs of Trees 8, 10, 12, 14, 16, 18 and 18a will be required to accommodate the proposed development. The areas of encroachment are occupied by impermeable surfaces and as such there should be no impacts. If any roots are exposed during construction they must be pruned by a Certified Arborist in accordance with good arboricultural practice.

JACKSON ARBORICULTURE INC.
118 Pleasant Ridge Rd.
Brantford ON
N3R 0B8
905-512-6303
jeremy@jacksonarbor.ca

Tree Inventory and Preservation Plan

1600 Kerns Road
Burlington, ON

Project #	P207	Figure #	1
Date	March 2021 Revised February 2022		
Scale	1 : 500		