BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Scoped Environmental Evaluation Report / Environmental Impact Assessment

720, 735 & 740 Oval Court and 5135 & 5155 Fairview Street, Burlington, Ontario

Prepared For:

Branthaven Development Corporation

Prepared By:

Beacon Environmental Limited

Date: *Project:*

Revised January 2024 **218416**

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Report Versions Issued

Version	Date	Revisions
1.	December 2020	Draft
2.	January 2021	Revisions based on agency comments
3.	May 2021	Revisions based on agency comments
4.	March 2023	Final for Submission
5.	June 2023	Revisions based on w/o Prejudice discussions with Region
6.	November 2023	Minor revisions based on w/o Prejudice discussions with Region and Revised Figures 8 and 9
7.	January 2024	Minor revisions based on w/o Prejudice discussions with Region

1. Introduction

Beacon Environmental Limited (Beacon) was retained by Branthaven Development Corp. (Branthaven) to prepare a Scoped Environmental Evaluation Report/Environmental Impact Assessment (EER/EIA) in support of a redevelopment proposal for properties located at 720, 735 and 740 Oval Court and 5135 and 5155 Fairview Street in the City of Burlington, herein referred to as the subject lands. The subject lands comprise 4.59 hectares of existing commercial and industrial development situated north of Fairview Street and south of the CN rail line immediately between Appleby Creek and Sherwood Park (**Figure 1**). The proponent intends to redevelop the subject lands into a transit-oriented community designed for residential, retail and commercial uses.

The subject lands form part of the future Appleby GO Central Precinct and Fairview Frequent Transit Corridor Precinct. These precincts have been identified for a mix of future high rise and mid-rise residential, retail and commercial uses. Additionally, the draft precinct plan identifies a potential active transportation corridor (i.e., pedestrian bridge) crossing of Appleby Creek between the subject lands and the Appleby GO Station.

The subject lands are identified as part of a future Mobility Hub in the City of Burlington's New Official Plan (November 2020). The Mobility Hub will be comprised of Mixed-Use Nodes and Intensification Corridors. In June 2022, the City released the Draft Major Transit Station Areas, Area-Specific Planning Study (Draft MTSA, ASP). Section 5 of the study is specific to the Appleby GO Area-Specific Plan Study which is also referred to as Appleby Gateway South. This area is envisaged to evolve as an urban village with a balanced mix of employment, mid-rise residential and commercial opportunities, bordered by Sherwood Forest Park. Section 5.2.2 of the study establishes the following unique objectives for Appleby Gateway:

- Providing new parks and open spaces to serve employment areas and employees;
- Generally allowing for higher intensity development on employment lands to help establish the MTSA as a major employment destination;
- Concentrating the highest intensity employment uses in close proximity to the GO Station, Appleby Line and QEW corridor, north of the rail corridor;
- Creating new streets and active transportation connections to enhance the existing transportation network to improve permeability for pedestrians and cyclists and mitigate traffic associated with future growth;
- Focus on creating safe streets for pedestrians and cyclists to travel along streets in the area with high levels of truck traffic servicing the employment uses; and
- Opportunity to attract higher density, major office uses in proximity to the GO Station.

As outlined in Section 5.3 of the Draft MTSA, ASP (June,2022), schedules, policy directions and policies specific to the Appleby GO MTSA will be provided at a later date. While the specific policies are associated with the Appleby GO MTSA are not yet available, certain studies within the Mobility Hub study area have already been completed that provide insight into existing conditions. These studies include the Appleby Creek Flood Mitigation and Erosion Control Environmental Assessments, completed by the City of Burlington, which identified reaches of Appleby Creek currently impacted by flooding and erosion and recommended mitigation measures for addressing these impacts.

This EER/EIA has reviewed and integrated the findings of these studies to identify natural heritage opportunities and constraints of the broader Mobility Hub study area using existing natural heritage and

natural hazard data. The review was scoped to the Appleby Creek watershed portion of the Mobility Hub study area as this is the area that could potentially be affected by the proposed development and not the Sheldon Creek watershed portion which is further removed and unaffected.

The Appleby Creek valleylands adjacent to the subject lands form part of the City's Natural Heritage System (NHS) and are identified on Schedule M in the City's OP. Due to the proximity of the proposed development to the NHS, it is the policy of the City to require that an EER/EIA be prepared to demonstrate that the development proposal will not adversely impact upon the NHS or its functions. As per Policy 2.5e, the EER/EIA is to be completed in accordance with the 2015 Region of Halton EIA guidelines. These guidelines are very comprehensive and require addressing potential impacts on a broad range of natural heritage features and functions, many of which are not associated with the subject lands. Given that the subject lands have previously been developed and located in a highly urbanized environment, the study requirements were scoped by developing Terms of Reference (TOR) for the EER/EIA.

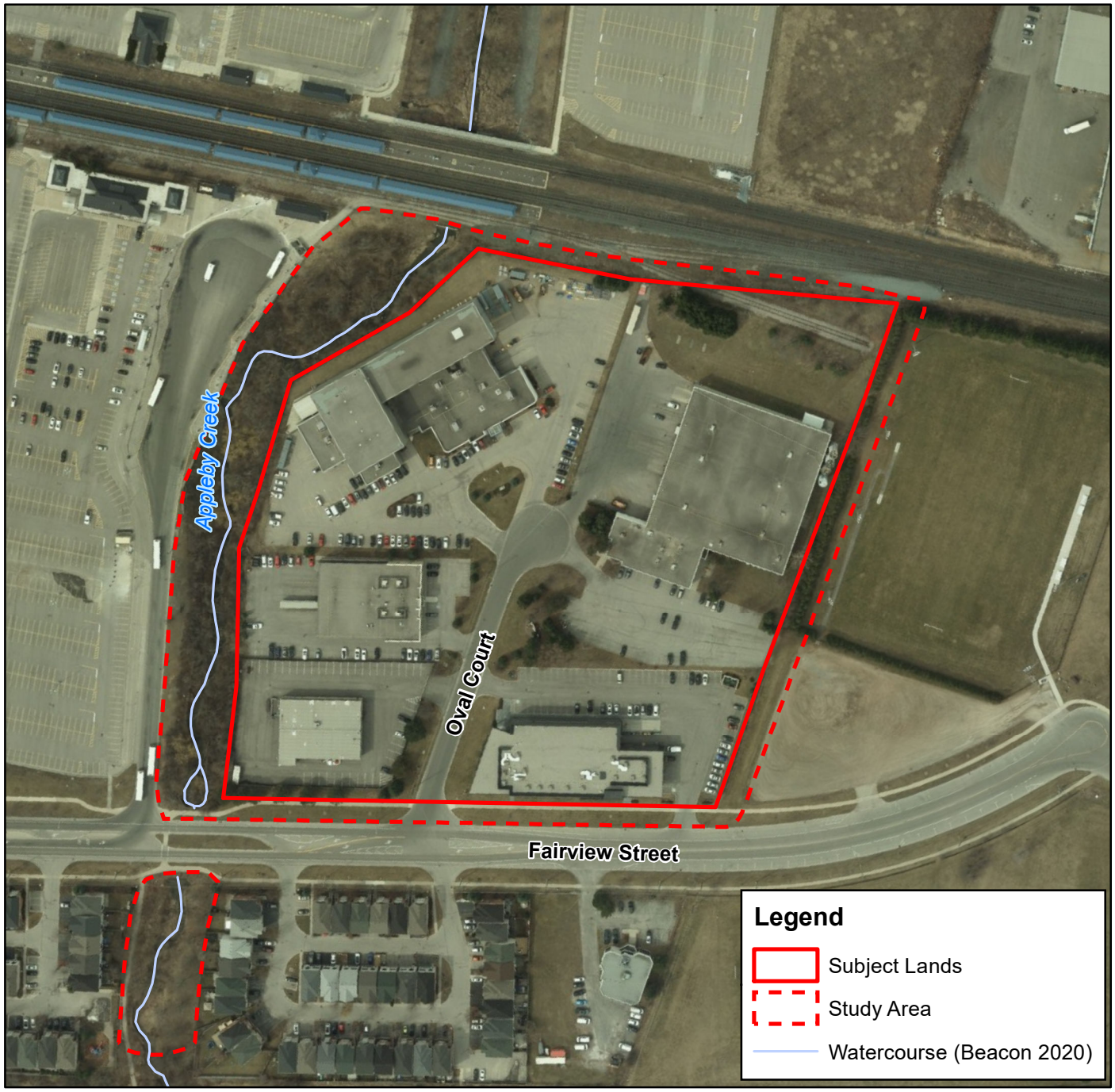
The Appleby Creek valleylands adjacent to the subject lands were the subject of two recent Environmental Assessment (EA) studies by the City of Burlington related to flood mitigation (Aquafor Beech Ltd. 2019) and erosion control (Aquafor Beech Ltd. 2020), which are described in **Section 3.1**. As such, the City has two approved EAs that propose works within the valleylands adjacent to the subject lands. These works include corridor reconstruction, including vegetation removal, natural channel design, and restoration with native species as well as an upgrade to the crossing of Fairview Street.

The first draft of the EER/EIA TOR were submitted on June 3, 2019, and comments were received from the Region of Halton and CH mid October 2019. Following that, specific tasks for the EER/EIA were confirmed in the approved TOR dated October 2, 2020. Since that time, the TOR was updated to address the March 29, 2021 pre-consultation notes and is now dated April 13, 2021. This April 2021 TOR is being submitted alongside this EER/EIA report as Beacon is of the opinion that the updates applied since October 2020 are minimal and will be found acceptable by the Region and CH. A copy of the final red-lined TOR (April 2021) and agency comments is provided in **Appendix A**.

An EER/EIA was originally submitted in May 2021 as part of the First Submission Package. Comments were received from the agencies in the fall of 2021 and spring of 2022. A revised EER/EIA was submitted in March 2023 to address the comments received as well as subsequent changes to the engineering design and site plan.

This EER/EIA report has been prepared using information collected through the background review (described in **Section 2** and **Section 3**) and supplemented with field investigations (described in **Section 3** and **Section 4**), and information and analyses supplied by other disciplines on the EER/EIA Study Team. Key information sources relied upon include:

- Functional Servicing and Stormwater Management Report Oval Court Redevelopment City of Burlington Halton Region (Urbantech Consulting – March 2023);
- Landscape Concept Plan (NAK Design Strategies – February 2023);
- Site Plan (Core Architects Inc. February 2023);
- Arborist Report & Tree Inventory and Preservation Plan 720, 735 & 740 Oval Court and 5135 & 5155 Fairview Street, Burlington (Beacon - March 2023);
- Oval Court Redevelopment Geomorphic Assessment 720, 735 & 740 Oval Court and 5135 & 5155 Fairview Street, Burlington, Ontario (Beacon - March 2023);





Site Location	Figure 1
Environmental Evaluation Report/Environmental Impact Assessment (EER/EIA) - Oval Court Redevelopment, City of Burlington	
BEACON ENVIRONMENTAL	Project: 218416 Last Revised: March 2023
Client: Branthaven Development Corp	Prepared by: SZ Checked by: SG
1:2,500	Inset Map:1:45,000

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- Appleby Creek Flood Mitigation Environmental Assessment (Aquafor Beech Ltd. 2019);
- Appleby Creek Erosion Control Environmental Assessment (Aquafor Beech Ltd. 2020);
- Hydrogeological Investigation 720, 735 & 740 Oval Court and 5135 & 5155 Fairview Road Burlington, Ontario L7L 6A9 (DS Consultants Ltd. 2020); and
- Preliminary Geotechnical Investigation 720, 735 and 740 Oval Court 5135 and 5155 Fairview Street (DS Consultants Ltd. 2021).

2. Environmental Planning & Regulatory Framework

This section of the EER/EIA provides an overview of environmental, legislation, policies and regulations that may be directly relevant to the project including the following:

- *Fisheries Act;*
- *Migratory Birds Convention Act;*
- *Endangered Species Act;*
- Provincial Policy Statement;
- Halton Region Official Plan – Office Consolidation;
- City of Burlington Official Plan; and
- Conservation Halton Regulation and Policies.

The overview presented below is not intended to be comprehensive, but does highlight key legislative, regulatory and policy requirements that pertain to the proposed re-development. A summary of how the proposed re-development conforms to the various natural heritage protection legislation, policies and regulations is discussed in **Section 9**.

2.1 Provincial Policy Statement

The Provincial Policy Statement (PPS; MMAH 2020) provides policy direction to municipalities on matters of provincial interest as they relate to land use planning and development. The PPS provides for appropriate land use planning and development while protecting Ontario's natural heritage. Development governed by the *Planning Act* must be consistent with the policy statements issued under the PPS. These are outlined in Section 2.1 - Natural Heritage, Section 2.2 – Water, and Section 3.1 - Natural Hazards of the PPS, and relevant sections from each are provided in the following pages.

2.1.1 Natural Heritage

The PPS includes policies that speak to the identification and protection of natural heritage systems, as well as levels of protection for the various components that comprise such systems. Some of these features are present in the study area and must be assessed in the context of these policies.

The policies specific to natural heritage are found in Section 2.1 of the PPS and are provided in their entirety below:

2.1.1 Natural features and areas shall be protected for the long term.

2.1.2 The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.

2.1.3 Natural heritage systems shall be identified in Ecoregions 6E & 7E, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.

2.1.4. Development and site alteration shall not be permitted in:

a. significant wetlands in Ecoregions 5E, 6E and 7E; and

b. significant coastal wetlands.

2.1.5 Development and site alteration shall not be permitted in:

a. significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;

b. significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);

c. significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);

d. significant wildlife habitat;

e. significant areas of natural and scientific interest; and

f. coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b).

Unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

2.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

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

2.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5 and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

2.1.9 Nothing in policy 2.1 is intended to limit the ability of agricultural uses to continue.

In terms of implementation, identification of the various natural heritage features noted above is a responsibility shared by the Ministry of the Environment, Conservation and Parks (MECP), Ministry of Natural Resources and Forestry (MNRF) and the municipal planning authority. The MECP is responsible for the confirmation of habitat of endangered species and threatened species, and for its regulation (under the ESA), while the MNRF is responsible for the identification of Provincially Significant Wetlands (PSWs) and Areas of Natural and Scientific Interest (ANSIs).

Local and regional planning authorities are responsible for the identification of Significant Woodlands, Significant Valleylands, and Significant Wildlife Habitat (SWH), with support from applicable guidance documents including the *Natural Heritage Reference Manual* (MNR 2010), *Significant Wildlife Habitat Technical Guidelines* (MNR 2000), and *Significant Wildlife Habitat Criteria for Ecoregion 7E*, MNRF 2015b). Local and regional planning authorities in southern Ontario also typically work with their local conservation authority to identify and confirm significant natural heritage features that may have significance at the local or regional level. As noted in **Section 2.6**, identification and verification of fish

habitat is now self-regulated although enforcement of the related policies and regulations is still managed by MNRF and regulated by DFO.

In areas where significant natural heritage features are present, the boundaries of natural heritage features are further refined through site-specific studies undertaken as part of the planning process and in accordance with the requirements of municipal policies.

2.1.2 Water

Section 2.2 of the PPS directs planning authorities to protect, improve or restore the quality and quantity of surface and groundwater water resources through watershed and land use planning, as per the policies below cited in their entirety.

2.2.1 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;*
- *f. Implementing necessary restrictions on development and site alteration to:*
  - *a. Protect all municipal drinking water supplies and designated vulnerable areas; and*
  - *b. 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 for water conservation and sustaining water quality;*
- *h. Ensuring consideration of environmental lake capacity, where applicable; and*
- *i. Ensuring stormwater management practices minimize stormwater volumes and contaminant loads, and maintain or increase the extent of vegetative and pervious surfaces.*

2.2.2 Development and site alteration shall be restricted in or near sensitive surface water features and sensitive ground water features such that these features and their related hydrologic functions will be protected, improved or restored.
Mitigative measures and/or alternative development approaches may be required in order to protect, improve or restore sensitive surface water features, sensitive ground water features, and their hydrologic functions.

Compliance with these policies requires a multi-disciplinary and integrated approach to land use planning. Such an approach has been adopted through the preparation of this EER/EIA.

2.1.3 Natural Hazards

In addition to balanced protection of natural heritage resources and water resources, the PPS also includes policy direction regarding reducing the potential risk to Ontario's residents from natural or human-made hazards. Section 3.1 of the PPS generally discourages development within identified natural hazards (i.e., areas that are at risk of flooding and / or erosion).

2.2 Halton Region Official Plan

The ROP (2018) includes policies related to natural heritage systems, water management, servicing, soil erosion / contamination, and trees which apply to this redevelopment application. Excerpts from policies that are relevant to the proposed redevelopment are presented in the subsections below.

2.2.1 Regional Natural Heritage System Policies

One of the key requirements for this EER/EIA is the identification, confirmation and refinement of the boundaries of the Regional Natural Heritage System as it relates to the subject lands. ROP sections 113 to 118 contain policies that provide direction for development and site alteration proposals within and adjacent to the Regional Natural Heritage System.

Policy 115.2 states that the Regional Natural Heritage System consists of areas that are designated as NHS on ROP Map 1 as well as significant habitats of endangered and threatened species that are not mapped. ROP Map 1 illustrates the limits of Key Features of the Regional Natural Heritage System. While this mapping is provided at a coarse scale, the limits of the Regional Natural Heritage System appear to follow the publicly owned creek block / valley limits adjacent to the subject lands.

Policy 115.3 describes the various components that constitute the Regional Natural Heritage System as follows:

115.3(1) 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,*

115.3(2) Enhancements to the Key Features including Centres for Biodiversity,
115.3(3) Linkages,
115.3(4) Buffers,
115.3(5) Watercourses that are within a Conservation Authority Regulation Limit or that provide a linkage to a wetland or a significant woodland, and

115.3(6) Wetlands other than those considered significant under Section 115.3(1)(b).

Policies 118(1) and 118(1.1) require protection of key features listed above. Policy 118(2) requires implementation of the Regional Natural Heritage System by:

a) Prohibiting development and site alteration within significant wetlands, significant coastal wetlands, significant habitat of endangered and threatened species and fish habitat except in accordance with Provincial and Federal legislation or regulations;
b) Not permitting the alteration of any components of the Regional Natural Heritage System unless it has been demonstrated that there will be no negative impacts on the natural features and areas or their ecological functions; …
c) Refining the boundaries of the Regional Natural Heritage System in accordance with Section 116.1; and
d) Introducing such refinements at an early stage of the development or site alteration application process and in the broadest available context so that there is greater flexibility to enhance the ecological functions of all components of the system and hence improve the long-term sustainability of the system as a whole.

As indicated in section 118(2)(c), policy 116.1 allows for the boundaries of the Regional NHS to be refined, with additions, deletions and / or boundary adjustments, through a Sub-watershed Study, an EER/EIA, or similar studies based on terms of reference accepted by the Region.

With respect to an EIA, Policy 118(3) states:

The purpose of an EIA is to demonstrate that the proposed development or site alteration will result in no negative impacts to that portion of the Regional Natural Heritage System or unmapped Key Features affected by the development or site alteration by identifying components of the Regional Natural Heritage System as listed in Section 115.3 and their associated ecological functions and assessing the potential environmental impacts, requirements for impact avoidance and mitigation measures, and opportunities for enhancement.

This EER/EIA is intended to fulfill the requirement of this policy.

It is the Region's policy to restrict the alteration of the features and their ecological functions within the Regional Natural Heritage System. Section 118(3) requires the proponent of any development, including public works, located wholly or partially inside or within 120 metres (m) of the Regional Natural Heritage System to carry out an EIA, unless:

a) The proponent can demonstrate to the satisfaction of the Region that the proposal is minor in scale and/or nature and does not warrant an EIA;
b) It is a use conforming to the Local Official Plan and permitted by Local Zoning By-laws;
c) It is a use requiring only an amendment to the Local Zoning By-law and is exempt from this requirement by the Local Official Plan; or
d) It is exempt or modified by specific policies of this Plan.

The ROP does not permit the alteration of any components of the Regional Natural Heritage System unless it has been demonstrated that there will be no negative impacts on the identified natural features and areas, or their ecological functions, through the completion of an EIA.

Wetlands, as defined by the Region, include:

> *Lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants.*

2.2.2 Environmental Quality Policies

Part IV of the ROP (2018) includes a section on Environmental Quality, with a number of general policies that speak to the need for an impact assessment in certain areas or under certain conditions, as well as support for use of alternative engineering standards to promote sustainability in land use planning (S. 141.8).

Specific policies related to the protection water (Policy 145) and land (Policy 147) relevant to this EER/EIA include:

> *145. It is the policy of the Region to:*
> - *145(10) Encourage the protection and enhancement of watercourses and headwaters areas as an integral component for maintaining natural hydrological processes within a watershed.*
> - *145(12) Promote the regeneration of natural areas near watercourses.*
> - *145(17) Consider the impact of development on fish habitat and ensure compliance with the* Federal Fisheries Act.
> - *145(23) Restrict development and site alteration in or near sensitive surface and groundwater features and require the proponent to carry out an Environmental Impact Assessment in accordance with policies of this Plan and, undertake where appropriate, hydrogeological and hydrological studies to protect, improve or restore such features.*
>
> *147. It is the policy of the Region to:*
> *(5) Recognize and protect trees as a renewable natural resource essential to the health and welfare of Halton residents, wildlife and rural environment, and to this end: …*
> *(e) Support the Local Municipalities in requiring that all development proposals, to the maximum degree possible, preserve existing trees and plant additional trees in accordance with good forestry management practice.*
> *(f) Require all development proposals to submit, at the time of initial application, an inventory of trees on site and a tree saving and planting plan unless the development will not result in the removal of any trees.*
> *(6)(d) Promote the development of treescapes along streams and valleys so as to reduce flooding and excessive soil erosion, maintain stream banks and slope stability, and provide suitable fish habitat.*

2.3 City of Burlington Official Plan

The new City of Burlington Official Plan (November 2020) was appealed by Branthaven Development, and therefore this EER/EIA refers to polices from the City Official Plan (1997 – Office Consolidation 2019). These polices are summarized in the sections below. Notwithstanding there is a new City of Burlington Official Plan, the intent of the policies noted below and how they are implemented are similar. In addition, the City's new NHS policies are essentially the same as the Region's RNHS policies, which are summarized as in **Section 2.2** above.

2.3.1 Natural Heritage Policies

The City of Burlington Official Plan identifies significant natural features using three separate land use designations as follows:

- The Greenlands designation includes lands that form a permanent natural resource base consisting of natural features and open space areas which are ecologically sensitive;
- The Major Parks and Open Space designation applies to community and city-wide parks and other public and private open space lands; and
- The Watercourse designation applies to most of the creeks and drainage features.

The subject lands do not overlap with any Greenlands or Major Parks and Open Space designated areas and is therefore not subject to policies in S. 6.2 and S. 6.3 of the City Official Plan, although Sherwood Forest Park in the northeastern study area is designated as Major Parks and Open Space. Additionally, S. 6.4 relates to the Watercourse designation which has been applied to Appleby Creek and includes policies relating to protection of life and property in floodplains. The Watercourse policies prohibit development in floodplains but do encourage degraded watercourses to be restored and enhanced to improve fish habitat. Furthermore, the policy specifies that: "Any works within or near a watercourse shall be reviewed by the City and Conservation Halton for floodplain implications" and that "new development adjacent to watercourses shall be subject to a setback from the stable top of bank, the regulatory floodplain and meander belt width (whichever is the greater) that are associated with the watercourse" as determined by the City, in conjunction with CH.

In addition, the City of Burlington uses the same definition of wetland as the Region (see end of **Section 2.2**).

2.3.2 Environmental Evaluation Policies

Section 2.5 of the City OP Functional Policies (Part II) include policies requiring that an EER/EIA be prepared in support of development applications to the satisfaction of the City. The requirement for an EER/EIA is generally triggered by the proximity of a development application relative to natural features. In the case of the subject lands, the proposed development will occur on lands adjacent to a watercourse and associated floodplain and triggers the need for an EER/EIA. Section 2.5 (c) and (d), also require the EER/EIA to fulfill the requirements of a Regional EIA and Conservation Authority's EIA. Section 2.5 (e) further refers to the use of the Region's EIA Guidelines, which are being followed for this EER/EIA. Section 2.5 (g) outlines a process for preparing Terms of Reference for the EER/EIA through pre-consultation with the City and partner agencies and Section 2.5 (h) relates to confirmation of natural heritage feature boundaries with City and agency staff.

The City also requires that the EER/EIA include recommendations for buffers and development setbacks [S. 2.5 (j)] and plans to restore any degraded open space and environmental features [S.2.5 (l)].

2.3.3 Sustainable Design and Compatibility

Section 2.7 of the City OP Functional Policies (Part II) states that: "To the greatest extent possible, proposed development shall be consistent with the goals and objectives of Sustainable Development". This includes consideration for efficiency, accessibility (by foot, bicycle and public transit), preservation of existing trees and other vegetation, enhancement of the City's urban forest canopy and compatibility with existing significant natural features. These requirements are included within the approved EER/EIA TOR (**Appendix A**) and/or are within this EER/EIA as well as other supporting reports such as the *Functional Servicing and Stormwater Management Report* (Urbantech Consulting 2023).

2.3.4 Storm Water Management Policies

Section 2.11 of the City OP Functional Policies (Part II) includes policies related to storm water management. These policies require consideration of flooding, erosion, hydrogeology, storm water quality and sedimentation, and implementing storm water management techniques that are naturalistic as opposed to man-made and maintaining and restoring natural hydrologic and ecologic function of significant watercourses.

Polices considered relevant to this proposal are listed below:

2.11.2.1(a)	*To ensure that future development does not increase the risk of property damage and danger to life from flooding.*
2.11.2.1 (b)	*To reduce flood potential in areas that are flood-prone.*
2.11.2.1 (c)	*To manage flooding concerns in a way that maintains or enhances fish habitat and other natural resource features.*
2.11.2.2(a)	*To minimize the adverse impact of development on downstream watercourse erosion.*
2.11.2.2(e)	*To ensure that future development does not increase the risk of property damage and danger to life from erosion.*
2.11.2.3 (a)	*To control future development in a way that maintains and/or enhances significant groundwater recharge and prevents undesirable groundwater level decline and reduction in base flow to watercourses.*
2.11.2.3 (b)	*To ensure base flow maintains permanent and seasonal fish habitat where it exists naturally.*
2.11.2.3(c)	*To minimize the possible negative effects on groundwater quality from land use practices and/or development.*
2.11.2.4 (a)	*To control the quality of storm water runoff from future developed surfaces so that the natural surface water and groundwater quality is maintained or restored.*

2.4 Conservation Halton Policies and Regulation

CH regulates development, including site alteration, within and adjacent to wetlands, watercourses and valleylands under Ontario Regulation 162/06 (*Regulation for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*) pursuant to Section 28 of the *Conservation Authorities Act*.

The regulation enables CH to grant permission for development within these areas if, in its opinion, the control of flooding, erosion, pollution, or the conservation of land will not be affected by the development.

According to Policies 2.1 and 2.2 of the *Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document* (Conservation Halton 2020), development is generally prohibited:

- Within a watercourse, valleyland, hazardous lands, wetland and lands adjacent or close to the shoreline of the Great Lakes-St. Lawrence River System or to inland lakes that may be affected by flooding, erosion or dynamic beaches;
- Within 15 metres of the stable top of bank of a major valley system and 7.5 metres of the stable top of bank of a minor valley system, where a valley is apparent;
- Within 15 metres from the greater of the limit of the floodplain or the predicted meander belt width of a watercourse associated with a major valley system and within 7.5 metres from the greater of the limit of the floodplain or the predicted meander belt width of a watercourse associated with a minor valley system, where a valley is not apparent;
- Within 120 metres of a Provincially Significant Wetland and all wetlands greater than or equal to 2 hectares in size;
- Within 30 metres of wetlands less than 2 hectares in size;
- Within 5 metres of the furthest landward extent of the aggregate of the flooding, erosion and dynamic beach hazards along the Lake Ontario and Hamilton Harbour shorelines; and
- Hazardous lands.

However, policies 2.4 – 2.50 (inclusive) do provide for some exceptions to the above prohibitions. Additionally, policies 2.19.1 and 2.19.2 are related to flood plain alterations, which is directly related to this project. These policies are included below.

Policy 2.19.1:

> *Major flood plain alterations (including placement of fill to create, or enlarge, a building lot) and major watercourse alterations (including enclosures and diversions from one watershed to another) are generally not permitted. Such alterations may be considered where justification is provided through a subwatershed study, an Environmental Assessment or similar comprehensive study and are subject to conformity with municipal planning documents. The applicable study or assessment must be current (generally within 5 years) and must be supported by Conservation Halton.*

Policy 2.19.2

> *Flood plain and watercourse alterations, that are minor in nature or have been justified under Policy 2.19.1 will be evaluated on an individual basis having consideration for the following:*

a) *Maintenance of the natural topography of the watercourse system, flood conveyance (no increase in off-site flood elevations and on-site increases will only be permitted where it has been shown that it will not result in an increased risk to life or property) and flood storage (maintenance of stage- storage-discharge relationships for a range of rainfall conditions);*
b) *No adverse impacts on fluvial processes (including the 1:100-year meander belt width);*
c) *No adverse impacts on groundwater recharge/discharge;*
d) *Geotechnical (i.e. slope stability) issues are adequately addressed; and,*
e) *Implementation of recommendations within Conservation Halton approved watershed or subwatershed studies or Environmental Assessment.*

Also, the watercourse crossings shall be minimized and designed in accordance with these CH policies 219- 2.20. As per the pre-consultation notes (March 29, 2021):

> *Access to the valley corridor for watercourse crossings shall be minimized and designed to take advantage of existing impacted or open areas on the valley slope. At a minimum, the design of the proposed pedestrian bridge will need to allow for natural channel migration, fish/terrestrial passage, sediment transport, and minimize risk to infrastructure, among other requirements.*

As outlined in Policy 2.4 (Slopes and Slope Stability), Appleby and Sheldon Creeks are considered to be minor valley systems. As such, a 7.5m regulatory allowance adjacent to the greater of the erosion or floodplain hazard would be applicable.

In addition to its regulatory responsibilities under the *Conservation Authorities Act*, CH provides an advisory role to municipalities through the planning process. Relevant policies provided in Section 4 of the *Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document* (Conservation Halton 2020) include:

- A minimum 7.5 m (minor valley) lot line setback from flooding and erosion hazards for new development (s.4.2.3), and similar setbacks for valleylands (s.4.3.2);
- A minimum 15 m vegetation protection zone from the limit of non-PSW wetlands less than 2 ha (s.4.4.3); and
- A minimum lot line setback of 30 m from PSW or other protected wetlands greater than 2 ha, and 15 m from other wetlands less than 2 ha for new development (s.4.4.4).

Wetland, as defined in the *Conservation Authorities Act* means land that:

a) *Is seasonally or permanently covered by shallow water or has a water table close to or at its surface;*
b) *Directly contributes to the hydrological function of a watershed through connection with a surface watercourse;*
c) *Has hydric soils, the formation of which has been caused by the presence of abundant water; and*
d) *Has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water;*

> *But does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a wetland characteristic referred to in clause c) or d).*

The study area includes regulated areas such as valleylands, floodplains, watercourses and wetlands. Under Ontario Regulation 162/06, any development or site alteration proposed within a regulated area requires a permit from CH.

CH no longer completes screenings on behalf of DFO under the Federal *Fisheries Act*, and so overseeing fish habitat related approvals is no longer within CH's delegated responsibility.

2.5 Ontario *Endangered Species Act*

Species at Risk (SAR) in Ontario include species that are listed as endangered, threatened or special concern at the provincial level, however the *Endangered Species Act* (ESA) only regulates the habitat of endangered or threatened species. Species listed as special concern are addressed through the Provincial Policy Statement (PPS) and policies pertaining to Significant Wildlife Habitat (SWH).

The ESA provides legal protection to the habitat of endangered and threatened species where it occurs. Relevant sections of the ESA are included below:

Subsection 9(1) of the ESA states that:

> *No person shall,*
> - *(a) Kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;*
> - *(b) Possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,*
>   - *(i) A living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,*
>   - *(ii) Any part of a living or dead member of a species referred to in subclause (i),*
>   - *(iii) Anything derived from a living or dead member of a species referred to in subclause (i); or*
> - *(c) Sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii).*

Subsection 10(1)(a) of the ESA states that:

> *No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species.*

However, under subsection 17(1) of the ESA, the Minster may issue a permit that authorizes a person to engage in an activity that would otherwise be prohibited by subsection 9(1) or 10(1) of the ESA provided the applicable legislative requirements of subsection 17(2) are satisfied. The *Endangered Species Act* Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits is a

document that provides guidance regarding permitting requirements under the Act. Relevant excerpts are provided below:

> *There are four types of permits that may be issued for authorizing activities where the activity:*
> - *Is necessary for the protection of human health or safety - clause 17(2)(a);*
> - *Has the main purpose to assist, and would assist, in the protection or recovery of the species - clause 17(2)(b);*
> - *Has the main purpose not to assist in the protection or recovery of the species, but through specific and mandatory conditions outlined in the permit will result in an overall benefit to the species within a reasonable time - clause 17(2)(c); and*
> - *Will result in significant social or economic benefit to Ontario, but will not jeopardize the survival or recovery of species at risk - clause 17(2)(d).*
>
> *Permits may be issued where the following legislated requirements are satisfied:*
>
> *The Minister is of the opinion that the main purpose of the activity authorized by the permit is not to assist in the protection or recovery of the species specified in the permit; but,*
> - *(ii) The Minister is of the opinion that an overall benefit to the species will be achieved within a reasonable time through requirements imposed by conditions of the permit,*
> - *(iii) The Minister is of the opinion that reasonable alternatives have been considered, including alternatives that would not adversely affect the species, and the best alternative has been adopted, and*
> - *(iv) The Minister is of the opinion that reasonable steps to minimize adverse effects on individual members of the species are required by conditions of the permit.*

An Overall Benefit Permit may only be issued where the legislated requirements in clause 17(2)(c) of the Act will be met by the conditions in the permit.

2.6 Federal *Fisheries Act*

In Ontario, the Department of Fisheries and Oceans Canada (DFO) manages fish habitat and the Ontario Ministry of Natural Resources and Forestry (MNRF) manages fisheries.

Fish and fish habitat are protected under the federal *Fisheries Act* (1985) which was last amended on August 28, 2019. The protection provisions of the *Fisheries Act* apply to all fish and fish habitat throughout Canada and are the authorities for the regulation of works, undertakings or activities that risk harming fish and fish habitat. Specifically, the protection provisions include two core prohibitions. One is against persons carrying on works, undertakings or activities that result in the "death of fish by means other than fishing" (subsection 34.4(1)), and the other is "harmful alteration, disruption or destruction of fish habitat" (subsection 35(1)). The protection provisions are applied in conjunction with other applicable federal laws and regulations related to aquatic ecosystems, including the *Species at Risk Act.*

Subsection 34.4 (1) states: "No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish."

Subsection 35. (1) states: “No person shall carry on any work, undertaking or activity that results in harmful alteration, disruption, or destruction of fish habitat.”

Fish habitat is defined in subsection 2(1) of the *Fisheries Act* to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include but are not limited to: spawning grounds and nursery, rearing, food supply and migration areas.

Under subsection 35(1) a person may carry on such works, undertakings or activities without contravening this prohibition, provided that they are carried on under the authority of one of the exceptions listed in subsection 35(2), and in accordance with the requirements of the appropriate exception. In most cases, this exception would be Ministerial authorizations granted to proponents in accordance with the Authorizations Concerning Fish and Fish Habitat Protection Regulations.

Proponents are responsible for planning and implementing works, undertakings or activities in a manner that avoids harmful impacts, specifically the death of fish and the harmful alteration, disruption or destruction of fish habitat. Where proponents believe that their work, undertaking or activity will result in harmful impacts to fish and fish habitat, DFO will work with proponents to assess the risk of their proposed work, undertaking or activity resulting in the death of fish or the harmful alteration, disruption or destruction of fish habitat and provide advice and guidance on how to comply with the *Fisheries Act*. Appleby Creek (which borders the subject lands to the west) is known to support fish habitat.

2.7 *Migratory Birds Convention Act*

The *Federal Migratory Birds Convention Act* (MBCA; 1994) protects the nests, eggs and young of most bird species from harassment, harm or destruction. On the subject lands, this legislation would apply in relation to any proposed vegetation clearing as part of the implementation of the proposed site redevelopment plan, once approved. Although there are no permitting requirements, proponents must comply with the legislation and may be fined if found to be in contravention of the MBCA.

Environment Canada currently considers the “high risk” period for encountering nesting birds to be from mid-March to late August. Therefore, to ensure compliance with the MBCA, vegetation clearing during this period is typically discouraged, particularly in natural or naturalized areas. This is because although screening for active nests can be conducted, it is typically very difficult to detect all active nests during the breeding season. However, vegetation clearing outside this window, and even within this window, is generally permissible as long as there is no evidence of nesting birds in the areas to be disturbed.

Regardless of the date, any nest and the habitat to support the nesting birds is protected under the MBCA, and therefore even for proposed vegetation clearing outside of the “high risk” window, surveys should be conducted by a qualified environmental inspector to screen for active nests prior to works being undertaken.

3. Methodology

3.1 Background Review

Background information pertaining to the natural and physical setting of the subject lands and study area was gathered and reviewed at the outset of the project. Information sources included:

- Region of Halton Official Plan;
- City of Burlington Official Plan;
- Natural Heritage Information Centre;
- MECP – Client's *Guide to Preliminary Screening for Species at Risk* (May 2019) – refer to **Appendix B** for consultation with MECP regarding the *Endangered Species Act*;
- Physiography of Southern Ontario (Chapman and Putnam 1984);
- Halton Natural Areas Inventory;
- Data request to Conservation Halton for data from long-term monitoring in the study area;
- Bird Studies Canada;
- Herpetological Atlas;
- Ontario Butterfly Atlas; and
- Ontario Mammal Atlas.

In addition to the above information sources, the Appleby Creek Flood Mitigation Environmental Assessment (EA) (Aquafor Beech Ltd. 2019) and Appleby Creek Erosion Control EA (Aquafor Beech Ltd. 2020) were reviewed. The natural heritage assessments completed for the EA included a broader study area (New Street to Fairview Street) which overlaps with the project study area. As the level of investigations in the EA were intended for a larger area, it was necessary to undertake field studies to confirm conditions and gather supplemental data. Where appropriate, information from the EAs were integrated into this report as background material.

3.1.1 Municipal Class Environmental Assessment for Appleby Creek Flood Mitigation between Fairview Street and New Street

Aquafor Beech Limited (2019) completed a municipal Class Environmental Assessment (Class EA) for Appleby Creek in the City of Burlington. The purpose of the study was to identify flood mitigation opportunities within the Appleby Creek watershed from the Canadian National (CN) Railway to New Street. The primary objective of the study was to identify specific opportunities that reduce flooding risk and protect the natural heritage features and functions within the project study area. Flood risks were identified and quantified in terms of buildings within the flood limit, frequency of road inundation, and hydraulic conveyance capacity of the channel and road crossing structures.

Reach 3 (Fairview Street to the CN Rail) of the study was relevant to the subject lands as this reach flows immediately west of the subject lands and is within the EIA/EER study area. Reach 3 was described as a straightened and confined stream corridor with a relatively steep gradient. Erosion was observed at several locations, including areas of bank and valley erosion and sometimes within shale bedrock. Several sections of the gabions were in a deteriorated state, in particular at the storm sewer outlet for the Appleby GO station parking lot and the gabion grade control structure upstream of Fairview Road. The report noted that, under existing conditions, the Regional floodplain extends into three lots

within the subject lands, as well as overtopping Fairview Street with flooding extending to the intersection of Fairview Street and Oval Court.

The Class EA considered a 'do nothing' approach, Fairview Road crossing structure improvements, low impact development (LID) opportunities, local restoration works and channel modifications as alternative design solutions for Reach 3. Ultimately, the report recommended upgrading the existing Fairview Street crossing to provide flood relief up to the 100-year storm within Reach 3. The preferred alternative would still have resulted in the Regional Storm overtopping Fairview Street. Minor channel works were also recommended at the inlet and outlet of the new crossing structure to ensure an optimal hydraulic transition along Appleby Creek. Further, and subject to coordination with relevant private landowners, additional design solutions such as creek widening were discussed within the Class EA as a potential future opportunity to provide additional flood relief for the subject lands east of Appleby Creek.

3.1.2 Appleby Creek Erosion Control Environmental Assessment

In 2016, the City of Burlington completed the Burlington City-Wide Creek Inventory and Erosion Assessment. The report highlighted priority erosion sites within the City requiring further study. In response to these findings, the City of Burlington retained Aquafor Beech Limited (2020) to complete the Appleby Creek Erosion Control Environmental Assessment. The study area for the EA was defined as the portion of Appleby Creek extending from Lake Ontario to the South Service Road. The intent of this study was to assess the existing conditions within the study area, identify and characterize existing erosion hazards, and develop alternatives to address the hazards.

In support of the field assessment, the study delineated Appleby Creek into seven reaches within the study area; Reach 6 of Appleby Creek (Fairview Street to Harvester Road) is relevant to the subject lands. Erosion and several sections of failing gabion bank protection treatments were noted along the reach within the report; in particular, the Appleby GO Station storm outlet and the gabion grade control structure upstream of Fairview Street were flagged as areas experiencing erosion. It was noted that the Fairview Street structure was likely originally intended to protect an existing watermain that crosses under the channel at that location but was in a degraded state and preventing seasonal fish passage.

Erosion Site 7B was identified along the portion of Reach 6 adjacent to the subject lands. Erosion Site 7A was identified as the portion of Appleby Creek between Fairview Street and the Centennial Bikeway (i.e., south of the subject lands, partially within the EIA/EER study area). While described by the report as a site, Erosion Sites 7A and 7B referred to several areas of bank erosion and undermined/failing gabion baskets observed along the entire length of creek between the Metrolinx Corridor and Centennial Bikeway crossing of Appleby Creek.

The EA considered a 'do nothing' approach, local restoration works, and comprehensive reach-scale works as alternative design solutions for Erosion Sites 7A and 7B. Ultimately, the conceptual design for Erosion Sites 7A and 7B included in the EA report recommended the implementation of reach-scale bed and bank protection works along the entire length of creek between the Metrolinx Corridor and Centennial Bikeway. The conceptual design referred to this approach as an *Engineered Channel Design to Enhance Conveyance and Protect Private Properties.* This approach included the removal of existing gabion baskets, installation of armourstone retaining wall lining both sides of the creek, roundstone riffle-pool features and in-creek vegetation buffer, with retrofit of existing storm outfall into the restorative bank works. The report noted that the integrated channel widening design between Fairview Street and Metrolinx Corridor would allow for flood relief, which will also tie into the

recommendation from the Appleby Creek Flood EA study (i.e., widen the Fairview Street bridge). In order to achieve the proposed channel widening, armourstone retaining walls were proposed to form the channel banks/valley slopes. Slopes above the armourstone wall would be restored with native trees and shrubs upon completion of the erosion control works.

Based on the Conceptual Design for Erosion Sites 7A and 7B provided in the EA report and our understanding of design solutions that have been implemented along other urbanized watercourse reaches within the City of Burlington (refer to **Photograph 1**), implementation of reach-scale works will entail the following design elements:

- Removal of existing vegetation within the creek corridor;
- Excavation activities, including:
    - Removal of existing gabion basket bank protection measures;
    - Regrading of the entire corridor to widen the bottom width;
    - Reinforcement of the corridor side slopes with armourstone retaining walls; and
    - Reconstruction of the low flow (bankfull channel) in the form of an engineered channel design that extends across the entire bottom width of the corridor, with stone bar features to enhance hydraulic roughness;
- Revegetation of remaining buffer areas between the retaining walls and creek block limits.



Photograph 1. Existing Armourstone-lined Creek Corridor Design in the City of Burlington – Roseland Creek North of Lakeshore Road

Widening of the existing Fairview Street crossing structure, as identified through the Appleby Creek Flood EA study was also supported. Further, Section 4.4.4 of the EA report discussed additional input from private landowners (i.e., subject lands) in relation to the potential dedication of land along the

eastern limit of Appleby Creek in support of a possible channel widening, which could be taken into consideration during the detailed design stage.

3.2 Field Investigations

In accordance with the approved TOR (**Appendix A**), a number of ecological surveys were undertaken by Beacon in 2019 to characterize the ecological features and functions associated with the study area. Details of the various field investigations are summarized below in **Table 1**. Field sheets are included in **Appendix C**.

Table 1. Summary of Ecological Investigations

Surveys Undertaken	Date (2019)	Time of Survey	Personnel	Weather
Ecological Land Classification and Floristic Survey	June 6	10:00 – 14:00	Dan Westerhof (Terrestrial Ecologist)	24°C, sunny
	Aug 26	11:00 – 14:00		23°C, sunny
Tree Inventory	April 30 * December 19, 2022	10:30 – 16:30	Natasha Collins (Landscape Designer [O.A.L.A. Associate Member]/Certified Arborist) *Todd Smith (B.Sc., M.L.A., OALA, CSLA, ISA / Senior Landscape Architect, Practice Lead)	9-12°C, Beaufort Wind Scale 1, Cloud Cover 50-100%, No Precipitation
Breeding Amphibian Surveys	April 22	22:10 – 22:25	Anna Cunningham (Terrestrial Ecologist) Grace Coker (Aquatic Biologist)	11°C, Beaufort Wind Scale 0, Cloud Cover 70%, No Precipitation
	May 27	22:29 - 22:45		17°C, Beaufort Wind Scale 0, Cloud Cover 95%, No Precipitation
	July 3	23:09 - 23:00		22°C, Beaufort Wind Scale 0, Cloud Cover 20%, No Precipitation
Breeding Bird Surveys	June 7	7:10 – 7:50	Rosalind Chaundy (Senior Ecologist) Anna Cunningham (Terrestrial Ecologist)	15-16°C, Beaufort Wind Scale 0, Cloud Cover <5%, No Precipitation
	July 3	8:15 – 9:00		23°C, Beaufort Wind Scale 0-1, Cloud Cover 60%, No Precipitation (humid)
Bat Habitat Assessment	April 30	10:30 – 16:30	Anna Cunningham (Terrestrial Ecologist)	9-12°C, Beaufort Wind Scale 1, Cloud Cover 50-100%, No Precipitation
Bat Acoustic Monitoring	June 1 – July 3	6 hours per night	Anna Cunningham (Terrestrial Ecologist)	Various

Surveys Undertaken	Date (2019)	Time of Survey	Personnel	Weather
Aquatic Habitat Assessment & Fish Community Sampling	August 13	8:30-12:00	Blair Kimble (Aquatic Biologist) Grace Coker (Aquatic Biologist)	27°C, Beaufort Wind Scale 1, Cloud Cover 50-100%, No Precipitation

* Supplemental tree inventory and assessment (culvert works south of Fairview Street)

3.2.1 Ecological Land Classification

As was noted in **Section 3.1**, in preparing this EER/EIA, Beacon had reviewed previous ecological assessments that had been completed in support of the Appleby Creek Erosion Control and Flooding Environmental Assessment Studies. This included a review of the previous Ecological Land Classification (ELC) community classifications and mapping. This previous work was completed at a broader scale and not at the site-specific scale as is required to satisfy the EER/EIA TOR. For this reason, Beacon has relied on more detailed level site-specific information collected through the current investigation.

Site visits were conducted in the spring and summer of 2019 to document the ecological communities and vegetation resources associated with the subject lands and study area. Communities were mapped and described according to the *Ecological Land Classification System for Southern Ontario* (Lee *et al.* 1998), which involved delineating vegetation communities on an aerial photograph of the study area and recording pertinent information concerning the vegetation composition and structure.

3.2.2 Floristics

Floristic surveys were completed within the study area in conjunction with ELC surveys. A list of vascular plants encountered during the field investigations was compiled.

3.2.3 Tree Inventory

An ISA Certified Arborist completed an inventory of all trees with a diameter at breast height (DBH) of 10 cm within 6 m of the subject lands on April 30, 2019. A supplemental inventory and assessment was completed by Beacon on December 19, 2022, for all trees within 6 m of the proposed culvert works south of Fairview Street. Trees on the subject lands were marked with numbered aluminum forestry tags. Tagged trees were surveyed by a registered Ontario Land Surveyor.

All trees were assessed, and data was collected on species, trunk diameter, and health and condition. The condition of individual trees was assessed in terms of overall health and structural integrity based on indicators such as live buds, dead wood, decay, structural defects, and presence of disease. Each tree was assigned a condition rating as follows:

- **Poor** – Severe dieback, significant lean, missing leader, major defects, significant decay and/or disease presence;
- **Fair** – Moderate dieback and/or lean, limb defects, multiple stems, moderate foliage damage from stress;

- **Good** – Healthy vigorous growth, minor visible defects or damage; or
- **Dead** – No live crown.

This information was used to prepare an Arborist Report that contains a Tree Inventory and Preservation Plan (TIPP) that includes recommendations for tree preservation and tree removal. A copy of the Arborist Report has been submitted under sperate cover (Beacon 2023).

3.2.4 Amphibians

Anurans surveys were undertaken in the study area during the spring of 2019 to record the presence/absence of early, mid and late season breeding frogs and toads. These auditory surveys were conducted following the Marsh Monitoring Protocol (Bird Studies Canada 2009) during the prime breeding period to record calling males that are present, spread throughout the breeding season to include the short temporal peak for each species of interest. In addition to the three-minute point count, staff walked the edge of Appleby Creek during the survey to listen for calling amphibians to ensure no calling amphibians were missed since the study area is located in a loud, urbanized setting.

Surveys were conducted using the point count method whereby the surveyor stands at a set point for a specific period and records all species that can be heard calling from the location. Each survey station was surveyed for three minutes. Calling intensity for each species detected was assigned a call code as follows:

- Call Code 1 - individuals of one species can be counted, calls not simultaneous;
- Call Code 2 - some calls of one species simultaneous, numbers can be reliably estimated; and
- Call Code 3 - full chorus, calls continuous and overlapping.

For call codes 1 and 2, the estimated number of calling individuals was recorded.

Point count stations were established in proximity to capture potential breeding amphibian habitats (i.e., wetlands and ponds). The locations of the point count stations are illustrated on **Figure 2**. Additionally, Appleby Creek was walked and listened to for calling amphibians outside the prescribed three-minute window.

Finally, objects were flipped to search for other amphibian species on the subject lands or study area during the field surveys conducted by Beacon in 2019. If observed, species and location would be noted.

3.2.5 Breeding Birds

Surveys for breeding birds were conducted in accordance with the protocols provided in the Ontario Breeding Bird Atlas Guide for Participants (Cadman *et al*. 2007). Two surveys were completed over the spring on June 7 and July 3, 2019 between 7:10 and 9:00 am on days with low to moderate winds (0-3 Beaufort Scale), no precipitation and temperatures within 5°C of normal average temperatures. The entire study area was walked to detect (visually or audibly) any potentially breeding species. For each observation, the location, number of individuals and breeding evidence was documented and mapped.

3.2.6 Reptiles

Reptile observations were noted incidentally during field surveys by flipping cover objects and searching for basking individuals.

3.2.7 Bats

To determine whether the study area supports potential roosting habitats for SAR bat species such as Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-Colored Bat or non-SAR species (Big Brown Bat and Silver-haired Bat) that may qualify as significant wildlife habitat, Beacon undertook assessments of the treed areas associated with the Appleby Creek valleylands, including snag tree assessments and acoustic monitoring.

Snag tree surveys were completed on April 30, 2019 during the leaf off period and under suitable weather conditions (i.e., no precipitation, not immediately following heavy snowfall). Snag trees with characteristics favourable to Little Brown Myotis (*Myotis lucifugus*), Eastern Small-footed Myotis (*M. leibii*), Northern Myotis (*M. septentrionalis*) and Tri-coloured Bat (*Perimyotis subflavus*) were considered. All trees exhibiting characteristics consistent with potential roosting habitat were documented by recording the following parameters:

- Tree Number and Location;
- Tree Species;
- Approximate tree height;
- Diameter Breast Height;
- Number of cavities;
- Characteristics of cavity;
- Approximately height of cavities; and
- Tree condition.

In addition to the snag tree assessment, acoustic monitoring stations were established in treed areas of the Appleby Creek valleylands and were monitored between June 1 and July 3, 2019. The location of the stations was determined using data collected during snag surveys and criteria presented in *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-Colored Bat* (Guelph District MNRF 2017).

At each of these stations an SM4BAT passive monitor equipped with an SMM-U2 ultrasonic microphone was deployed. Each monitor was programmed to record during triggered events each night for a period of six hours, beginning at sunset.

Recordings from the monitors were analyzed using KaleidoscopePro software. A combination of auto-identification and manual analysis was applied to call fields to make species determinations. All unclassified files (No ID Files) were manually reviewed for call frequency to determine if unclassified calls fell within the 40 kHz Myotis species and Tri-Coloured Bat range. If the call did not fall within the approximate 40 kHz range, it was not analyzed further as it was likely not a species at risk. Furthermore, a random selection of noise files was reviewed to ensure that the batch filters applied functioned as intended.

3.2.8 Aquatic Habitat Assessment

An aquatic habitat assessment for the reach of Appleby Creek within the study area was completed on August 13, 2019. The assessment follows the Rapid Assessment Methodology as described in Section



Legend

- Subject Lands
- Study Area
- Area Subject to Breeding Bird and Vegetation Surveys
- Aquatic Habitat Assessment and Fish Sampling Location
- Aquatic Habitat Assessment Reaches
- Watercourse (Beacon 2020)
- Amphibian Stations
- Temperature Logger Location

Biological Sampling | **Figure 2**

Environmental Evaluation Report/Environmental Impact Assessment (EER/EIA) - Oval Court Redevelopment, City of Burlington

BEACON ENVIRONMENTAL

Project: 218416
Last Revised: March 2023

Client: Branthaven Development Corp

Prepared by: SZ
Checked by: SG

1:1,500

0 25 50 m

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4 Module 4 of the Ontario Stream Assessment Protocol (OSAP) (Stanfield *et al.* 2010). The assessment involved walking the creek channel from Fairview Street to the CNR line and recording the following habitat characteristics:

- Stream morphology, runs, pools, riffles;
- Channel width and depth profile, bank height, bank stability;
- Substrate types and distribution;
- Seepage areas;
- Dams and obstructions;
- Riparian and in-stream cover type and extent;
- Floodplain vegetation;
- Wetland and pond areas; and
- Side channels and floodplain.

Additionally, representative photographs were taken.

3.2.9 Watercourse Thermal Assessment

Two Hobo Water Temp Pro V2 temperature loggers were installed on August 2, 2019 and removed on October 29, 2019. The loggers recorded water temperature at 15-minute intervals. Air temperature was collected using a Hobo Pro V2 temp/RH logger that was located 6 km from the subject lands. The locations of the loggers are shown on **Figure 2**.

To more fully characterize the thermal regime in Appleby Creek, temperature data was plotted using a nomogram as outlined in the *Evaluation of a Simple Method to Classify the Thermal Characteristics of Streams Using a Nomogram of Daily Maximum Air and Water Temperatures* (Chu *et al.* 2009). This nomogram typically uses the temperature data from July 1 to August 31, when the daily maximum air temperature was equal to or above 24.5°C. As the loggers were installed on August 2, the data from August 2nd to August 31st was used to create the nomogram. Notwithstanding that data for July is not available, it is Beacon's opinion that the August temperature data can be relied upon. Usually, with large data sets, the data is then filtered to periods with at least three (3) days of air temperatures above 24.5°C to remove any major changes in weather (Chu *et al*. 2009). However, due to the small amount of temperature data collected, all data with air temperatures over 24.5°C were included.

Daily maximum water temperatures measured between 16:00 and 18:00 were plotted against the corresponding daily maximum air temperatures. The data was also plotted against the ranges of five thermal classifications (i.e., Cold, Cold-Cool, Cool, Cool-Warm, Warm) to determine the thermal classification of the watercourse. This information was used to characterize the thermal classifications of the watercourse reaches more comprehensively during baseline conditions and to provide more fulsome context for changes and variations that may be documented in the future.

3.2.10 Fish Community Sampling

To characterize the fish community within the study area, the reach of Appleby Creek from Fairview Street to the CNR Line was electrofished on August 13, 2019 under authority of Licence to Collect Fish for Scientific Purposes No. 1093900, issued by the MNRF, Aurora District. A Halltech Backpack Electrofisher (Model HT 2000/05) and dip net were used. The entire length of channel between Fairview

Street and the CNR Line was fished to assess the various habitats within the creek. Captured fish were collected in a net, photographed and identified, then returned to the creek. The numbers caught, size and life stage were recorded in this process. A dot tally was used to record the number of fish in each species and the first 10 fish of each species were measured in length.

3.3 Feature Staking

A site visit was undertaken with Region of Halton and Conservation Halton staff on October 19, 2018. The top of valley slope associated with the Appleby Creek north of Fairview Street was staked by Conservation Halton staff. The dripline to trees along the eastern limit of the Appleby Creek valleylands north of Fairview Street was staked by Region of Halton. It should be noted that the staked dripline was considered preliminary as further analysis was required to determine whether the treed areas met the tree density requirements to satisfy the regional definition of a woodland. Subsequent to the first EER/EIA submission, it was determined that works south of Fairview Street would be required to support installation of the new culverts. No feature staking was undertaken for the area south of Fairview Street as Key Features are limited to Fish Habitat as they are to the north. As discussed in **Sections 3.1.1** and **3.1.2**, impacts to this area south of Fairview Street were previously identified in both the Appleby Creek Flood Mitigation and Erosion Control EA reports.

4. Characterization of the Biophysical Environment

4.1 Physical Environment

4.1.1 Bedrock Geology

The subject lands are underlain by fractured shale of the Queenston formation. Shale bedrock was encountered at between 0.5 and 3.0 m below ground surface (bgs) and was visible along the Appleby Creek banks (DS Consultants Ltd. 2020). The creek bed is on the bedrock, and Aquafor Beech Ltd. (2019) noted that the reach of Appleby Creek within the subject lands is predominantly exposed and fractured, shale bedrock.

4.1.2 Surficial Geology and Topography

The study area is located within the Iroquois Plain physiographic region of Southern Ontario and it is characterized by shale plain physiographic landform (DS Consultants Ltd. 2020). The Iroquois Plain is a lowland area bordering Lake Ontario from the Niagara River to the Trent River. The Iroquois Plain represents the ancient shoreline and lakebed of former Lake Iroquois. Between the ancient shoreline and the existing Lake Ontario shoreline, the plain is slightly sloping and covered with stratified sand, eroded red shale, or shallow till over bedrock (Chapman and Putnam 1984).

The subject lands are relatively flat with a surface elevation of approximately 101 - 103.5 m above sea level (masl) and general slopes south toward Lake Ontario, except for the Appleby Creek valleylands which are sloped (DS Consultants Ltd. 2020).

4.1.3 Soils

Soils on the subject lands are mapped as well drained Chinguacousy Clay Loam – rocky phase and clay loam in *The Soils of Halton County* (Gillespie & Wicklund 1971). The subject lands were extensively modified to accommodate the existing development. As such native soils have been removed and replaced with fill. As described in the *Geotechnical Investigation Report* prepared by DS Consultants Ltd. (2021), boreholes were drilled into paved surfaces that ranged 90 mm -125 mm of asphaltic concrete overlying a range of 200 mm – 250 mm of granular base. Below the pavement structure, fill deposits were noted that consisted of loose to compact sand and gravel with Trace silt. This was followed by cohesive deposits of clayey silt till and clayey silt till/shale complex, which extended to depths ranging from 0.5 m – 3.0 m below ground surface, which sat on bedrock of the Queenston formation as previously mentioned.

4.1.4 Drainage

Drainage is generally controlled by streams, artificial channels and underground utilities, and drainage is generally towards Lake Ontario located approximately 2.5 km south of the subject lands (DS Consultants Ltd. 2020). Appleby Creek is adjacent to the west of the subject lands, and Sheldon Creek is approximately 600 m to the east. Although Appleby Creek is the only drainage feature in the study area.

Urbantech Consulting (2023) describes that under existing conditions, the subject lands have three major drainage outlets for stormwater. These include the following:

- West Outlet, which is on the west side of Oval Court and drains uncontrolled directly into Appleby Creek (actually made up of three storm outlets);
- Oval Court Outlet, which drains uncontrolled most of the eastern portion of the subject lands directly to the storm sewers within Oval Court, which then attach to the Fairview Street storm sewer that ultimately discharges to Appleby Creek; and
- East outlet, which drains uncontrolled flow from a small portion of the eastern side of the subject lands to Sherwood Park, where it eventually enters the storm sewer on Fairview Street.

4.1.5 Hydrogeology

A hydrogeological investigation was conducted for the subject lands by DS Consultants Ltd. (2020). Twenty monitoring wells were used to assess the groundwater. Groundwater was found in monitoring wells ranging from 96.95-99.70 masl, representing the groundwater elevation for the subject lands. Based on groundwater level measurements DS Consultants Ltd. (2020) stated that the local groundwater flow direction is southeast from 740 & 720 Oval Court and northeast from 5135 Fairview Road, and that this flow direction is indicative of possible recharge conditions since the groundwater flow direction is away from Appleby Creek. They also noted that the groundwater flow direction may also be influenced by utilities or infilled material on the subject lands.

4.2 Natural Heritage Resources

4.2.1 Vegetation

4.2.1.1 Ecological Land Classification and Land Uses

Ecological Land Classification (ELC) communities are illustrated as polygons on **Figure 3** along with their associated areas (in hectares).

The tableland portions of the subject lands are entirely developed with commercial/industrial buildings and are not mapped as ecological communities. They are considered anthropogenic areas based on the land uses (refer to **Photograph 2**). Ecological communities within the Appleby Creek valley have been mapped and classified using ELC. ELC field data cards are included in **Appendix C**.

A total of four communities were identified within the valley adjacent to the subject lands and one additional community in the valley south of Fairview Street. These ecological communities are classified primarily as non-natural or cultural in origin as they do not have any corresponding natural analogs.



Photograph 2. Anthropogenic Area on the Subject Lands (April 30, 2019)

Unit 1. Cultural Woodland (CUW1) (0.53 ha)

This community is comprised of two subunits (1a and 1b) associated with the floodplain of Appleby Creek south and north of Fairview Street respectively. In the north end of the study area, unit 1b extends partially along the valley slope (see **Photograph 3)**.



Legend

- Subject Lands
- Study Area
- ELC Communities
- Watercourse (Beacon 2020)

ELC Unit	ELC Community	ELC Code	Area (ha)
1	Cultural Woodland	CUW1	0.53
2	Cultural Thicket	CUT1	0.42
3	Cultural Meadow	CUM1	0.15
4	Cattail Mineral Shallow Marsh	MAS2-1	0.01

Existing Conditions

Figure 3

Environmental Evaluation Report/Environmental Impact Assessment (EER/EIA) - Oval Court Redevelopment, City of Burlington

BEACON ENVIRONMENTAL

Project: 218416
Last Revised: March 2023

Client: Branthaven Development Corp

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The canopy in both subunits 1a and 1b is relatively open and consists of predominantly of young Black Walnut (*Juglans nigra*), Crack Willow (*Salix fragilis*), dead/dying Green Ash (*Fraxinus pennsylvanica*), and American Basswood (*Tilia americana*). The subcanopy consists Green Ash, Manitoba Maple (*Acer negundo*), Hawthorns (*Crataegus spp.*), and Common Buckthorn (*Rhamnus cathartica*). The understory consists of Tatarian Honeysuckle (*Lonicera tatarica*), Common Buckthorn, Common Privet (*Ligustrum vulgare*), and Chokecherry. Dominant ground covers are Tall Goldenrod (*Solidago altissima*), Thicket Creeper (*Parthenocissus vitacea*), Dame's Rocket (*Hesperis matronalis*), and Cleavers (*Galium aparine*).



Photograph 3. ELC Unit 1b - CUW1 (April 30, 2019)

Unit 2. Cultural Thicket (CUT1) (0.42 ha)

The community is associated with much of the western and eastern valley slopes north of Fairview Street. This community has been separated into two subunits (2a and 2b). A representative section is shown on **Photograph 4**. The community is dominated by Common Buckthorn and Hawthorn in association with young Green Ash, Manitoba Maple, and Common Apple (*Malus pumila*). Understorey shrubs include Tatarian Honeysuckle, Common Buckthorn, Privet, and Wild Red Raspberry (*Rubus idaeus ssp. strigosus).* Ground covers include Enchanter's Nightshade, Urban Avens (*Geum urbanum*), Tall Goldenrod, Garlic Mustard, and Thicket Creeper.



Photograph 4. ELC Unit 2a - CUT1 (April 30, 2019)

Unit 3. Cultural Meadow (CUM1) (0.15 ha)

This small meadow community is situated at the northern end of the study area adjacent to the rail corridor and berm. It is dominated by Kentucky Bluegrass (*Poa pratensis*), Tall Goldenrod, Thicket Creeper, and Creeping Thistle (*Cirsium arvensis*).

Unit 4. Cattail Mineral Shallow Marsh (MAS2-1) (0.01 ha)

This small marsh wetland community is the west bank of Appleby Creek immediately adjacent to the rail culvert. It is dominated by Narrow-leaved Cattail (*Typha angustifolia*), Purple Loosestrife (*Lythrum salicaria*), Jewelweed (*Impatiens capensis*), and Thicket Creeper.

4.2.1.2 Floristics

A total of 85 species of vascular plants were identified within the study area. A checklist of all plant species observed along with species status at the regional and provincial levels is provided in **Appendix D**.

Species conservation status is based on NHIC rankings (S-Rank) and Halton Natural Areas Inventory (Crins *et al*. 2006).

Two regionally uncommon species were identified within the valley portion of the study area: Clasping-leaved Indian Hemp (*Apocynum cannabinum*) and Virginia Stickseed (*Hackellia virginiana*). No

regionally or provincially rare, threatened, or endangered species were observed within the study area or are on record.

Over half (44/85) of the species identified within the study area are considered non-native to Ontario and most of the native species are ranked S5, indicating they are common and secure within the province. One species, Black Walnut, is ranked S4? indicating it is "Apparently Secure" in the province. This species has been widely planted and has naturalized well beyond its natural range, which was historically limited to the Carolinian zone of Ontario.

In general, the health and quality of the vegetation resources in the valley is poor due to the predominance of invasive non-native species and impacts of invasive pests such as Emerald Ash Borer which has affected the canopy trees. As with many urban creek systems, the ecological health and integrity have been compromised by past land uses and ongoing flooding and erosion.

4.2.1.3 Tree Inventory

A total of 385 trees were individually tagged and assessed. Of these 385, 130 trees are located on the subject lands. Six (6) trees correspond to the municipal road allowance (MRA), 248 trees are located within the Appleby Creek channel corridor and one (1) corresponds to adjacent public lands. Dominant species identified on the subject lands include Blue Spruce (*Picea pungens*) (25.8% of trees inventoried on the subject lands), followed by Austrian Pine (*Pinus nigra*) (14.4% of trees inventoried on the subject lands), and Silver Maple (*Acer saccharinum*) (8.3% of trees inventoried on the subject lands). Trees on the subject lands range in size from 10-101 cm DBH and have an average DBH of 24 cm. Overall trees on the subject lands are generally in good or fair condition.

A total of five (5) tree groups were also delineated on the subject lands and on adjacent lands. A total of 58 trees were recorded on the subject lands within Tree Groups A and B. Tree Group A is comprised of four White Spruce (*Picea glauca*) with DBH from 20-24 cm in fair-good condition. All trees in Group A have tree ties embedded in their trunks; one tree is showing signs of stress and thinning. Tree Group B is comprised of Norway Spruce (*P. abies*) all in fair-good condition. Due to these trees being planted in a tight group, many are one-sided on the shaded side. Ten trees in this group were found in poor condition due to being shaded.

An additional 158 trees were recorded adjacent to the subject lands within Tree Groups C, D, and E. Tree Group C is comprised of 5 Norway Spruce with DBH ranging from 18-24 cm in good condition. Tree Groups D and E are located along the northern property limit within Sherwood Forest Park and are comprised of White Cedar. Tree Group D includes 42 White Cedar ranging from 5-12 cm DBH in Good condition. Tree group D also includes one Green Ash with a DBH of 17; this tree is dead. Tree Group E includes 110 White Cedar that range in size from 5-20 cm DBH and are generally in good condition. Tree 582, a Norway Maple, was recorded in the City's Boulevard adjacent to Fairview Street and was found to be in good condition, while Tree 478 is located in the MRA associated with Oval Court. It is a Blue Spruce in fair condition. All trees in the MRA were found to be in good to fair condition.

Within the Appleby Creek valleylands, dominant species include Green Ash (*Fraxinus pennsylvanica*) (50% of trees inventoried within the corridor), followed by Hawthorn (*Crataegus* sp.) (12.4% of trees inventoried within the corridor), and Manitoba Maple (*Acer negundo*) (11.3% trees inventoried within the corridor. Except for Tree 338, all valleyland trees are associated with publicly owned lands.).

Detailed findings of the assessment are presented under separate cover in the Arborist Report (Beacon 2023).

4.2.2 Wildlife

The following subsections characterizes wildlife communities known to be associated with the study area based on information collected through background review described in **Section 3.1** and supplemental field investigations described in **Section 3.2**.

4.2.2.1 Amphibians

The Ontario Herpetofauna Summary Atlas uses 10 km x 10 km squares to map the distribution of amphibian records in Ontario (Ontario Nature 2019). It is important to note that the overlapping squares are much larger than the study area, so records are not necessarily associated with the subject lands. Furthermore, many records are historic as suitable habitat for certain species may no longer present. The atlas data for square 17PJ00 includes 422 records corresponding with 14 species from 1926 to 2019, including six salamander species and eight frog/toad species. None of the species are considered SAR.

Anurans surveys were conducted within the study area by Aquafor Beech Ltd. in 2018 as part of the 2018 Flood Mitigation EA Study (Aquafor Beech Ltd. 2019) but did not find any evidence of breeding anurans within the Appleby Creek Corridor adjacent to the subject lands.

Supplemental field investigations consisting of amphibian call surveys were completed by Beacon in 2019 and did not detect evidence of breeding anurans. During all three surveys, the water within Appleby Creek was flowing quickly. Additionally, no amphibian species were observed incidentally during site visits carried out by Beacon in 2019.

4.2.2.2 Breeding Birds

The Ontario Breeding Bird Atlas (OBBA) (Cadman *et al*. 2007), maintains records for breeding bird species using 10 km x 10 km squares. Species records from the square that overlaps with the study area (Square 17PJ00) were reviewed to establish which species may likely be associated with the area. It is important to note that the overlapping squares are much larger than the study area, so the birds recorded within the square aren't necessarily associated with the study area. There are 81 species noted from this square, including the following SAR:

- Chimney Swift (*Chaetura pelagica*);
- Barn Swallow (*Hirundo rustica*);
- Bank Swallow (*Riparia riparia*);
- Bobolink (*Dolichonyx oryzivorus*);
- Eastern Meadowlark (*Sturnella magna*);
- Eastern Wood-Pewee (*Contopus virens*); and
- Wood Thrush (*Hylocichla mustelina*).

Additionally, in 2018, breeding bird surveys for the section of the Appleby Creek adjacent to the subject lands were completed as part of the Flood Mitigation EA Study (Aquafor Beech Ltd. 2019). While no SAR species were detected by Aquafor Beech (2019), a Black-crowned Night Heron (BCNH; *Nycticorax nycticorax*) was observed on one occasion foraging downstream of the Appleby GO Station. The BCNH breeding population is considered provincially rare (S3B). No BCNH nests were observed during the EA study.

Beacon conducted supplemental breeding bird surveys of the study area in 2019 and had also noted birds incidentally during other field surveys. A total of 22 bird species were recorded from the subject lands in 2019. Of these, 12 species are considered to be potentially breeding. Adjacent to the subject lands (within the study area as shown on **Figure 1**), an additional seven breeding species and three non-breeding species (based on timing of survey or behaviour) were noted. The species observed by Beacon in 2019 were very similar to those previously recorded by Aquafor Beech Ltd. in 2018. A summary of species observed in 2019 is provided in **Table 2.**

BCNH were not observed to be nesting or breeding. BCNH typically nest in colonies and their stick nests are very discernible. No nests were observed during the numerous ecological and arboricultural surveys that have been completed over the years.

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Table 2. Breeding Bird Survey Results (2019)

Common Name	Scientific Name	Status					June 7, 2019		July 3, 2019	
		National Species at Risk COSEWIC[a]	Species at Risk in Ontario Listing[b]	Provincial breeding season SRANK[c]	Halton Regional Status[d]	Area-sensitive (MNR)[e]	On Subject Lands	Off Subject Lands*	On Subject Lands	Off Subject Lands
Black-crowned Night-Heron	*Nycticorax nycticorax*	-	-	S3	HU	-	-	-	-	-
Canada Goose	*Branta canadensis*	-	-	S5	I	-	-	-	-	-
Mallard	*Anas platyrhynchos*	-	-	S5	-	-	-	F	-	-
Killdeer	*Charadrius vociferus*	-	-	S5	-	-	1	-	-	1
Mourning Dove	*Zenaida macroura*	-	-	S5	-	-	2	-	1	2
Downy Woodpecker	*Dryobates pubescens*	-	-	S5	-	-	-	-	-	1
Northern Flicker	*Colaptes auratus*	-	-	S4	-	-	-	-	-	1
American Crow	*Corvus brachyrhynchos*	-	-	S5	-	-	-	-	-	1
American Robin	*Turdus migratorius*	-	-	S5	-	-	6	1	3	2
Gray Catbird	*Dumetella carolinensis*	-	-	S4	-	-	-	1	-	1
Cedar Waxwing	*Bombycilla cedrorum*	-	-	S5	-	-	1	-	1	-
European Starling	*Sturnus vulgaris*	-	-	SE	I	-	5	1	2	-
Yellow Warbler	*Setophaga petechia*	-	-	S5	-	-	-	1	-	1
Northern Cardinal	*Cardinalis cardinalis*	-	-	S5	-	-	-	1	1	1
Song Sparrow	*Melospiza melodia*	-	-	S5	-	-	-	1	-	2
Red-winged Blackbird	*Agelaius phoeniceus*	-	-	S4	-	-	-	1	1	1
Common Grackle	*Quiscalus quiscula*	-	-	S5	-	-	5	-	5	2
Brown-headed Cowbird	*Molothrus ater*	-	-	S4	-	-	2	1	-	-
Baltimore Oriole	*Icterus galbula*	-	-	S4	-	-	-	-	-	1
House Finch	*Haemorhous mexicanus*	-	-	SNA	I	-	-	-	1	-
American Goldfinch	*Spinus tristis*	-	-	S5	-	-	4	1	1	-
House Sparrow	*Passer domesticus*	-	-	SNA	I	-	9	1	5	-

*Off subject lands but within study area, as shown on **Figure 1**.
= Number of breeding pairs or territories; F = Foraging or flying over the study area; x = Observed outside of breeding bird surveys

a COSEWIC = Committee on the Status of Endangered Wildlife in Canada

b Species at Risk in Ontario List (as applies to ESA) as designated by COSSARO (Committee on the Status of Species at Risk in Ontario)

c SRANK (from Natural Heritage Information Centre) for breeding status if:
S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), SH (Historical)
SNA (Not applicable…'because the species is not a suitable target for conservation activities'; includes non-native species)

d Halton Natural Areas Inventory, Volume 2 Species Checklists (Halton Region 2006b)
HU = Uncommon I = Introduced

e MNR 2000.

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Most of the observations consist of common species that are regularly associated with disturbed habitats. Some of the more abundant species included House Sparrow (*Passer domesticus*), American Robin (*Turdus migratorius*), Common Grackle (*Quiscalus quiscula*) and European Starling (*Sturnus vulgaris*). Species that were observed flying or foraging within the study area and not breeding, included Black-crowned Night-Heron (*Nycticorax nycticorax*), Canada Goose (*Branta canadensis*) and Mallard (*Anas platyrhynchos*).

No SAR species were recorded from the recent surveys completed in 2018 and 2019. Additionally, none of the species observed are considered rare in Halton (Halton Region 2006b). However, the Black-crowned Night Heron, which was one incidental bird observation, is considered uncommon in Halton. It is also ranked S3, meaning it is Apparently Vulnerable (vulnerable within a particular province because it is rare or uncommon, it is located within a restricted range, or because other factors make it vulnerable to extinction). It was noted centrally in the Cultural Woodland (ELC Unit 1a) on April 30, 2019, which is where Aquafor Beach Ltd. also noted this species in 2018.

The MNRF classifies birds that require larger tracks of suitable habitat in which to breed, or those that have a higher breeding success in larger areas of suitable habitat as “area-sensitive” species. Area-sensitive species can be further broken down into woodland and grassland specialists, which typically require large tracts of their respective habitat types to breed and rear young successfully. No area-sensitive bird species were recorded from the study area.

4.2.2.3 Reptiles

The Ontario Herpetofauna Summary Atlas uses 10 km x 10 km squares to describe the distribution of reptile species in Ontario (Ontario Nature 2019). It is important to note that the overlapping squares are much larger than the study area, so records are not necessarily associated with the subject lands. Furthermore, many records are historic as suitable habitat for certain species may no longer present. The atlas data for the square that overlaps with the study area (Square 17PJ00) contains 114 records for of 11 species between 1952 and 2019. Records include four turtle species and seven snake species. Of the 11 species, three are considered SAR in Ontario, which include:

- Snapping Turtle (*Chelydra serpentina*);
- Eastern Hog-nosed Snake (*Heterodon platirhinos*); and
- Northern Map Turtle (*Graptemys geographica*).

As part of the Flood Mitigation EA (Aquafor Beech Ltd. 2019), reptile surveys were undertaken in 2018 to search for snakes and turtles within the Appleby Creek corridor. These surveys yielded no snake observations; however, it was determined that there was potential for foraging and dispersal habitat for Snapping Turtle but concluded that there is no suitable nesting habitat in the broader study area.

Beacon also completed surveys of the study area in 2019 and found that habitats in the valley did not provide optimal basking conditions for reptiles (turtles or snakes). There were no ponds, and the area was generally shaded by dense shrub cover and some trees. Beacon is of the opinion that the Appleby Creek within the study area of this EER/EIA does not provide optimal habitat for turtle foraging and dispersal. The surrounding study area is also highly urbanized which limits opportunities for foraging. There are also no aquatic habitats present in the broader study area to provide overwintering functions for Snapping Turtle.

Additionally, Beacon did not observe any snakes during the field surveys in 2019, despite efforts to flip incidental cover objects. However, it is expected that the common Eastern Garter Snake (*Thamnophis sirtalis*) could occur in the study area as this species is common in disturbed habitats in Ontario.

4.2.2.4 Bats

The Appleby Creek valleylands were assessed for potential bat roosting habitat as part of the Appleby Creek Flood Mitigation EA Study (Aquafor Beech Ltd. 2019), The assessment identified two trees within the study area that exhibited characteristics consistent with potential roosting habitat for SAR bats. These included a Green Ash and Crack Willow, which were located close to the Fairview Street crossing. These two trees are situated near Detector 45 that was installed by Beacon in 2019 to monitor bats acoustically.

Beacon also undertook bat roosting habitat assessments of the study area in 2019 and identified the presence of nine trees that exhibited characteristics consistent with potential roosts for SAR bats. All of the candidate roosting trees are associated with the Appleby Creek valleylands and the locations of the candidate trees are identified on **Figure 4**. A summary of the results from the habitat assessment is presented below in **Table 3**.

Table 3. Summary of Potential Maternity Roost Tree Assessment for SAR Bats (2019)

Tree #	Tree Species	Cavity #	DBH	Cavity Height (m)	Tree Height (m)	Loose Bark (%)	Decay Class*	Canopy Cover (%)
1	Green Ash	0	35	0	5-10	15	2	25–50
2	Bur Oak	0	11	0	5-10	0	1	25–50
3	Willow Sp.	10+	100+	0-10	10-15	0	2	25–50
4	Unknown Dead Snag	2	23	5-10	5-10	0	5	25–50
5	Green Ash	0	42;28;38;38	0	10-15	1-25	3	25–50
6	Green Ash	0	36;34;24	0	10-15	1-25	3	25–50
7	Green Ash	0	38;37	0	10-15	1-25	2	50–75
8	Crack Willow	10+	40;45	0-10	5-10	0	2	75–100
9	Green Ash	2	42;40	0	10-15	1-25	3	75–100

*Decay Class:
1. Healthy, live tree
2. Declining live tree, part of canopy lost
3. Very recently dead, no canopy, bark intact, branches intact
4. Recently dead, bark peeling, only large branches intact
5. Older dead tree, 90 percent of bark lost, few branch stubs, broken top
6. Very old dead tree, advanced decay, no branches, parts of the stem have rotted away

To determine whether bats are utilizing the study area, and if so, which species are present, Beacon conducted acoustic monitoring in 2019. A total of five species were detected over the monitoring period. Species observed and number of calls detected are summarized in **Table 4**.



Legend

- Subject Lands
- Study Area
- Bat Acoustic Monitor
- Potential Bat Roosting Location

Bat Habitat Assessment | **Figure 4**

Environmental Evaluation Report/Environmental Impact Assessment (EER/EIA) - Oval Court Redevelopment, City of Burlington

BEACON ENVIRONMENTAL

Project: 218416
Last Revised: March 2023

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Table 4. Acoustic Bat Monitoring Summary

Detector	Date (2019)	Big Brown Bat	Eastern Red Bat	Hoary Bat	Silver-haired Bat	Little Brown Myotis
45	June 1					1
	June 2		1		1	
	June 3			1		
	June 7		3		3	
	June 8				1	
	June 17			1		
	June 18	1				
	June 27			1		
	June 28					1
	June 29			3		
	July 1	1		1		
Detector 45 Total		**2**	**4**	**7**	**5**	**2**
114	June 8		1	1	3	
	June 9			6		
	June 11			2		
	June 13			1		
	June 15			1		
	June 17			1		
	June 18		1		2	
	June 19		1	1	6	
	June 20			1	3	
	June 22				1	
	June 24		1		8	
	June 25		1			
	June 26				1	
	July 2			1	2	
Detector 114 Total		**0**	**5**	**15**	**26**	**0**
118	June 1			1		1
	June 2		1			
	June 3			1		
	June 7					1
	June 8				1	
	June 11			2		
	June 12			1		
	June 13			1		
	June 14					1
	June 16			1		
	June 17			1		
	June 19	2				
	June 21			2		
	June 22				1	
	June 24			1		
	June 25		1	1		
	June 28	1		8	1	
	June 29			2		
	June 30			19		
	July 1	1		1		

Detector	Date (2019)	Big Brown Bat	Eastern Red Bat	Hoary Bat	Silver-haired Bat	Little Brown Myotis
Detector 118 Total		4	2	42	3	3
Overall Total		6	11	64	34	5

The most common species of bat recorded within the study area was the Hoary Bat (*Lasiurus cinereus*) with 64 recordings over the monitoring period. This species was recorded in abundance at all three detectors, especially detector 118. The second most common species recorded within the study area was the Silver-haired Bat with 34 recording, of which most were from detector 114. Eastern Red Bat (*Lasiurus borealis*) was the next most common with 11 recordings total, followed by Big Brown Bat with six recordings.

The least common species heard during the monitoring period was the Little Brown Myotis, with a total of five calls that were recorded on detectors 118 and 45 on four different nights. The findings of this analysis suggest that the area is not being utilized by endangered bat species for roosting, however MECP will be consulted prior to undertaking development and site alteration and the Region and City copied on related correspondences.

Analysis of the acoustic data detected only 2 Big Brown Bat and 1 Silver-haired Bat during the emergence period, i.e., any time within 1 hour of sunset, on 2 of the 33 nights in which the detectors were deployed. The low numbers of calls over this extended monitoring period is inconsistent with the presence of a maternity roost.

4.2.2.5 Incidental Wildlife Observations

Birds

Black-crowned Night-Heron was observed incidentally on April 30, 2019, during a snag survey, in a hedgerow adjacent to the Appleby Creek valley.

Canada Goose (*Branta canadensis*) was observed off the subject property. All other bird species observed incidentally were observed during the breeding bird studies (**Section 4.2.2.2**)

Mammals

Eastern Cottontail Rabbit (*Sylvilagus floridanus*) and Raccoon (*Procyon lotor*) were noted on and adjacent to the subject lands on April 30, 2019. Within the areas surveyed as part of the Flood Mitigation EA for Appleby Creek (2019), Aquafor Beech Ltd. also observed evidence of Raccoon, and also noted the presence of Grey Squirrel (*Sciurus carolinensis*). Other mammal species that are fairly common, urban-tolerant, and likely present on and adjacent to the subject lands include Striped Skunk (*Mephitis mephitis*) and Eastern Chipmunk (*Tamias striatus*).

Lepidoptera

The Ontario Butterfly Atlas uses 10 km x 10 km squares to describe the distribution of reptile and amphibian species in Ontario (MacNaughton *et al.* 2016). The square that overlaps with the subject lands (Square 17PJ00) was used to review the potential butterfly species that are present (within 1982-2018). This square has 44 species present (from 227 records), with only one SAR in Ontario: Monarch (*Danaus plexippus*).

Again, it is important to note that the overlapping squares are much larger than the study area, so the butterflies recorded within the square aren't necessarily present in the area. Additionally. some records may be historic and suitable habitat may no longer be present.

No butterflies were noted by Beacon during field work in 2019. Additionally, no butterflies were recorded during the Flood Mitigation EA Study (Aquafor Beech Ltd. 2019), which also noted that this section of Appleby Creek Corridor is not favourable for high quality butterfly habitat.

4.2.3 Aquatic Resources

4.2.3.1 Aquatic Habitat Assessment

The findings of the aquatic habitat assessment are presented below according to four transects. These transects were chosen based on channel morphology. As the conditions in Appleby Creek are relatively uniform, a riffle, pool and two runs were observed to characterize the entire channel. The habitat assessment began at the upstream end (CNR Line) to the downstream end of the subject lands (Fairview Street). It is important to note that directionality is taken facing upstream. The reach locations are illustrated on **Figure 2.**

Transect # 1

Reach 1 was approximately 15 m in length, located downstream of the CNR Line culvert. This portion of the channel had the stream morphology of a run with an average wetted width of 5.4 m and an average water depth of 0.26 m. Average bank full width was 6.7 m with an average depth of 0.55 m. Substrate was predominantly bedrock with gravel, cobble and sand. There was some aquatic vegetation at the edges, however there was not any within the centre of the channel. Watercress was present on the left bank. Riparian vegetation on the left bank consisted of grasses, shrubs and deciduous trees. On the right bank, there was grasses and deciduous trees. Rip-rap enclosed in a gabion basket was present on the right bank. Water temperature at the time of the assessment was 18.7 °C. This water temperature was taken during the mid-summer (August 13, 2018) around noon on a day where the air temperature was approximately 20 °C.

Transect #2

Further downstream, adjacent to 740 Oval Court., Appleby Creek enters a treed area. The channel at this location is defined by a deep pool. The section of channel assessed was approximately 5 m long. The average wetted width of a pool was 4.3 m with an average water depth of 0.37 m. Average bank full width was 4.8 m with an average depth of 0.6 m. Substrate within the pool was bedrock and shale.

There was no aquatic vegetation, however, riparian vegetation provided 90-100% canopy cover. On both the left and right banks, riparian vegetation consists of woodland species.

Transect #3

Following the pool is a riffle which is adjacent to 720 Oval Court parking lot. The length of channel assessed was approximately 10 m. The average wetted width was 2.5 m with an average water depth of 0.05 m. Average bankfull width at the riffle was 6.2 m with an average depth of 0.45 m. The substrate was predominantly cobble, gravel and shale on top of bedrock. There was no aquatic vegetation. Surrounding the channel consists of woodland species with a few patches of grass on both banks.

Transect # 4

At the downstream end of the subject lands, a run was assessed. The location of the run was approximately 20 m upstream of Fairview Road. The average wetted width was 3.9 m with an average water depth of 0.39 m. The average bankfull depth was 4.3 m with an average depth of 0.75 m. The substrate was mainly composed of bedrock, with some gravel and cobble on top. There was no in stream vegetation. Bank vegetation consisted of woody species. Notably, the left bank had an undercut depth of 0.52 m, while the right bank had an undercut depth of 0.10 m.

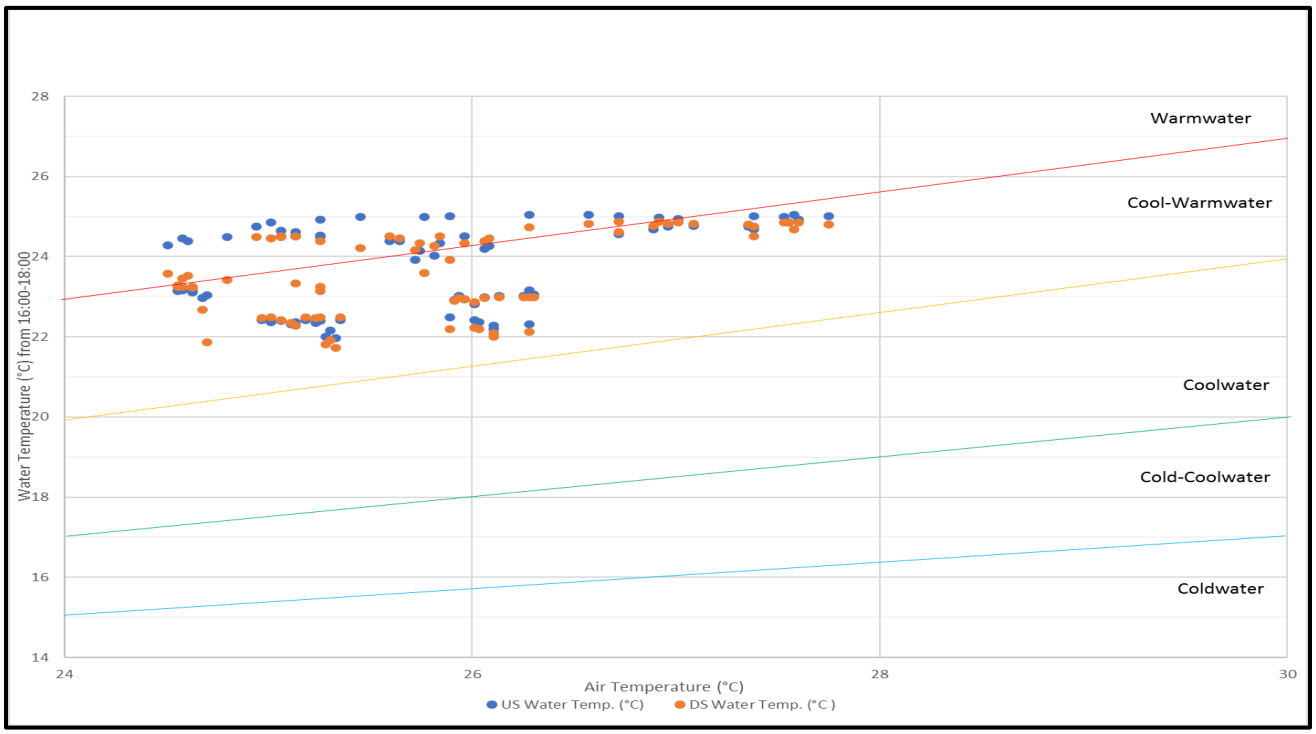
Downstream of Fairview Street

Downstream of Fairview Street, habitat consisted of a large scour pool downstream of the culvert, which transitioned to a run feature. Bankfull dimensions ranged between 5.5-7.2 m in width and 0.40-0.80 m in depth. Wetted widths ranged from 3.0-5.0 m and wetted depths ranged from 0.10-0.35 m. Substrate consisted of gravel, cobble (riprap), boulders, and exposed shale bedrock. There was no in stream vegetation. Bank vegetation consisted of woody species, herbaceous plants and manicured grass. Gabion basket hardening measures were present along the channel bank.

Overall, the portion of Appleby Creek within the study area is considered to provide good fish habitat. Trees within the riparian area provided cover and shade to the watercourse, moderating water temperatures. Grass was present in localized areas, but exposed tree roots and soil predominated the ground cover condition. The substrates provide refuge for smaller fish species while the pools provide habitat for larger fish. The presence of undercut banks indicated active erosion; however, fish are able to reside in these areas and within the rip rap along the channel banks. With the exception of the gabion grade control structure upstream of Fairview Road, fish barriers present within the channel were natural (substrate or large woody debris).

4.2.3.2 Watercourse Thermal Assessment

According to the Aquatic Resource Area database (MNRF 2015a) Appleby Creek is classified as a permanent watercourse with a warmwater thermal regime. Beacon collected water temperature data from August to October 2019. From this data, a nomogram was created and presented in **Figure 5**.



Credit: Chu *et al*. 2009

Figure 5. Water Temperatures between the hours of 16:00 and 18:00 on Days from August 1st to August 31st with Air Temperatures greater than or equal to 24.5°C

Based on the data presented in **Figure 5**, this portion of Appleby Creek has a thermal regime of cool-warmwater. This indicates that Appleby Creek can support both cool water and warmwater fish species. It is important to note that nomograms are typically created with water temperature data from July and August, however, the temperature logger was not installed until August. However, it is Beacon's opinion that the temperature readings are most consistent with a cool warmwater thermal regime.

4.2.3.3 Fish Community

Beacon was provided with historical fish data from Conservation Halton on July 11, 2019. This data is divided by stations created by CH and spans from the years 1994 to 2018. There were no stations within the study area, but the station directly upstream (APB-3) and 5 stations downstream (APB- 1, 2, 19, 20, 21) were analyzed (**Figure 6**)**.** This data was collected between 2001 and 2018. **Table 5** shows the fish species recorded by CH.

Table 5. CH Historical Fish Data

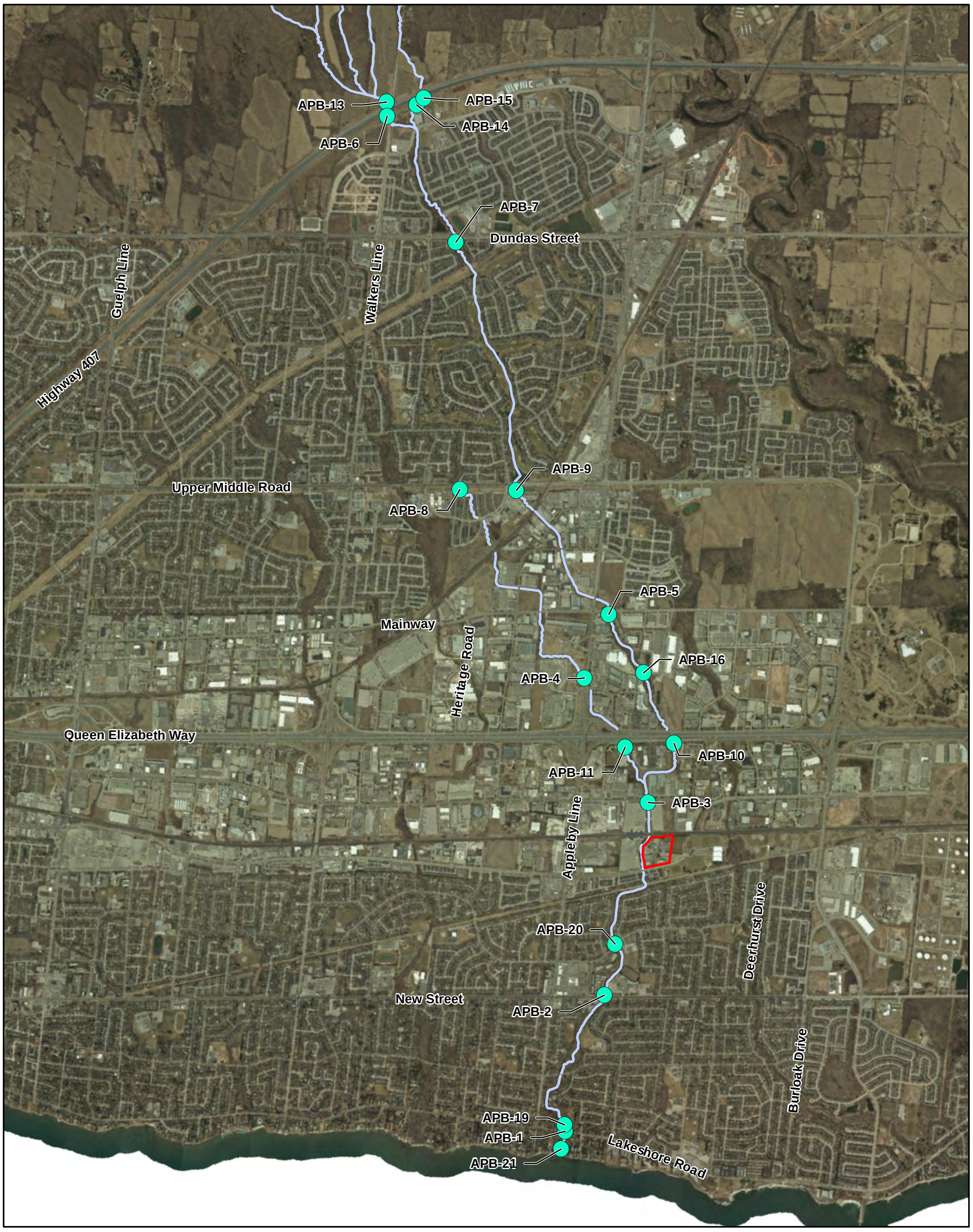
Station	Common Name	Scientific Name
APB-1	Blacknose Dace	*Rhinichthys atratulus*
	Creek Chub	*Semotilus atromaculatus*
	Fathead Minnow	*Pimephales promelas*
	Green Sunfish	*Lepomis cyanellus*
	Longnose Dace	*Rhinichthys cataractae*
	White Sucker	*Catostomus commersoni*
APB-2	Blacknose Dace	*Rhinichthys atratulus*
	Brook Stickleback	*Culaea inconstans*
	Creek Chub	*Semotilus atromaculatus*
APB-3 (directly upstream of site)	Brook Stickleback	*Culaea inconstans*
	Creek Chub	*Semotilus atromaculatus*
	Green Sunfish	*Lepomis cyanellus*
APB-19	Brassy Minnow	*Hybognathus hankinsoni*
	Creek Chub	*Semotilus atromaculatus*
	Largemouth Bass	*Micropterus salmoides*
	Pumpkinseed	*Lepomis gibbosus*
	Threespine Stickleback	*Gasterosteus aculeatus*
	White Sucker	*Catostomus commersoni*
APB-20 (directly downstream of site)	Creek Chub	*Semotilus atromaculatus*
	Fathead Minnow	*Pimephales promelas*
	Threespine Stickleback	*Gasterosteus aculeatus*
APB-21	Chinook Salmon	*Oncorhynchus tshawytscha*

It is important to note that the Chinook Salmon was recorded at the farthest downstream station (APB-21) which is located on the shoreline of Lake Ontario.

The fish caught during community (**Table 6**) sampling are comparable to the CH data. CH recorded a higher number of species, but this could be due to a larger study area. Two of the three fish species caught at each of the stations directly upstream and downstream of the subject lands were also caught within the reach of the Appleby Creek adjacent to the subject lands.

Table 6. Fish Species Present in Appleby Creek Adjacent to Subject Lands

Common Name	Scientific Name	# of Fish Caught	Size Range (mm)	Age Class
Creek Chub	*Semotilus atromaculatus*	123	56-143	Juvenile and Adult
Pumpkinseed	*Lepomis gibbosus*	17	51-89	Adult
Brook Stickleback	*Culaea inconstans*	4	39-45	Adult
Rainbow Trout	*Oncorhynchus mykiss*	19	55-82	Juvenile
Largemouth Bass	*Micropterus salmoides*	4	55-72	Juvenile
Fathead Minnow	*Pimephales promelas*	1	Not measured	Adult



Legend

- Subject Lands
- Fish Stations
- Watercourse

Conservation Halton Fish Record Locations

Figure 6

Environmental Evaluation Report/Environmental Impact Assessment (EER/EIA) - Oval Court Redevelopment, City of Burlington

BEACON ENVIRONMENTAL

Project: 218416

Last Revised: March 2023

Client: Branthaven Development Corp

Prepared by: SZ
Checked by: SG

1:30,000

0 500 1,000 m

Contains information licensed under the Open Government License–Ontario Orthoimagery Baselayer: FBS Halton Region (2021)

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4.3 Evaluation of Significance and Sensitivities

The following subsections describe the process for evaluating the significance of the various natural heritage features and ecological features that are associated with the subject lands and study area.

The relative significance of natural heritage features, ecological functions and attributes is generally determined by applying significance criteria that have been developed at the local and regional level. Where such criteria are not available, provincial criteria and guidelines have been considered.

Key sources of guidance for determining significance of the natural features and areas include: the PPS, the Halton Region OP and the City of Burlington OP. The following sections provide a summary of which natural heritage features and areas within the study area would be considered significant according to the policies, criteria and guidance provided in the above noted guidance documents. An overview of the relevant policies was provided in **Section 2** and additional details provided below.

4.3.1 Significant Habitat of Endangered Species and Threatened Species

Significant Habitat of Endangered Species and Threatened Species are recognized as Key Features within the Regional Natural Heritage System. Significance, as it relates to the habitat of endangered species and threatened species, is defined by the PPS (2020) as:

> *The habitat, as approved by the Ontario Ministry of Natural Resources, that is necessary for the maintenance, survival, and/or the recovery of naturally occurring or reintroduced populations of endangered species or threatened species, and where those areas of occurrence are occupied or habitually occupied by the species during all or any part(s) of its life cycle.*

The background review and results from various ecological surveys and habitat assessments undertaken in support of this EER/EIA confirmed the presence on only one listed species, the endangered bat Little Brown Myotis. This species was detected during the acoustic monitoring program. While this species is subject to the general habitat protections under the ESA, the MECP has focused its protection efforts on identifying and protecting maternity roosts primarily. The acoustic data collected over a 10+ day period has confirmed that there are very few Little Brown Myotis calls over this period and that there is high variability in the call times detected which is inconsistent with the call levels and times that would be expected if a maternity roost was present in the areas. It is Beacon's opinion that the study area does not support significant habitat of endangered and threatened species; however, MECP will be consulted prior to development and site alteration to confirm this assessment, and Beacon will copy the City and Region on these correspondences.

No other listed species were observed within the study area.

4.3.2 Significant Woodlands

Significant Woodlands are recognized as Key Features within the Regional Natural Heritage System. Significant Woodlands are defined in the PPS and in the ROP.

The PPS defines Significant Woodlands as follows:

> *… an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. These are to be identified using criteria established by the Ontario Ministry of Natural Resources.*

The ROP and the City of Burlington's OP both define a Significant Woodland as a Woodland that is 0.5 ha or larger, and is determined to be significant through a Watershed Management Plan, a Sub-watershed Study or a site-specific Environmental Impact Assessment by meeting 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 Planning Area or 4 ha or larger if it is located outside the Urban Planning Area but below the Escarpment Brow; or 10 ha or larger if it is located outside the Urban Planning Area but above the Escarpment Brow;
- The Woodland has an interior core area of 4 ha or larger, measured 100 m from the edge; or
- The Woodland is wholly or partially within 50 m of a major creek or certain headwater creek or within 150 m of the Escarpment brow.

Prior to application of the significant woodland criteria, it is necessary to first identify which of the treed features in the study area satisfy the definition of a "woodland" using the definitions contained in the ROP and City of Burlington's OP.

The ROP and the City of Burlington OP define 'woodlands" as follows:

> *… and with at least: 1000 trees of any size per ha, or 750 trees over 5 cm in diameter per ha, or 500 trees over 12 cm in diameter per ha, or 250 trees over 20 cm in diameter per ha but does not include an active cultivated fruit or nut orchard, a Christmas tree plantation, a plantation certified by the Region, a tree nursery, or a narrow linear strip of trees that defines a laneway or a boundary between fields. For the purpose of this definition, all measurements of the trees are to be taken at 1.37 m from the ground and trees in regenerating fields must have achieved that height to be counted.*

October 19, 2018, Halton Region staff staked the dripline of some treed features on and adjacent to the subject lands on a preliminary basis with the understanding that further analysis would be undertaken to confirm whether the tree densities satisfy the regional definition of a woodland.

Beacon has subsequently completed plot-based tree density analyses of the valleylands to confirm which areas meet the required tree density requirements to meet the regional definition of a woodland. The analysis is presented in **Appendix E**. There are two treed communities in the valleylands south and north of Fairview Street and both are classified as cultural woodland (CUW) and mapped as ELC Units 1a and 1b respectively as shown on **Figure 3.** Based on the findings of the tree density analysis, only ELC Unit 1b satisfies the tree density requirements to meet the regional definition of a woodland.

As it relates to woodland significance, ELC Unit 1b is less that 0.5 ha in area and therefore does not meet the regional criteria for Significant Woodland.

4.3.3 Significant Wetlands

Significant Wetlands are recognized as Key Features within the Regional Natural Heritage System. In relation to wetlands, significant is defined by the PPS (2020) as:

> *An area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the Province, as amended from time to time.*

There are no MNRF evaluated Provincially Significant Wetlands (PSWs) associated with the study area or environs. There is a small wetland community (ELC Unit 4 - Cattail Mineral Shallow Marsh) located in the Appleby Creek valleylands that is much smaller than 2 ha (it is approximately 0.01 ha) and is located approximately 15 m west of the subject lands.

This small wetland would not be considered a PSW and, as such, would not be considered a Key Feature in the Regional Natural Heritage System. ROP policies do include 'other wetlands' as components of the Regional Natural Heritage System, and this is discussed later in this report.

4.3.4 Significant Coastal Wetlands

The PPS defines coastal wetlands as:

> a) *Any wetland that is located on one of the Great Lakes or their connecting channels (Lake St. Clair, St. Mary's, St. Clair, Detroit, Niagara and St. Lawrence Rivers); or*
> b) *Any other wetland that is on a tributary to any of the above-specified water bodies and lies, either wholly or in part, downstream of a line located 2 kilometres upstream of the 1:100 year floodline (plus wave run-up) of the large water body to which the tributary is connected.*

There are no Significant Coastal Wetlands within the study area.

4.3.5 Significant Valleylands

Significant Valleylands are recognized as Key Features within the Regional Natural Heritage System. In relation to valleylands, significant is defined by the PPS (2020) as:

> *Ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system …*

Significant valleylands are normally identified by municipalities with input from their agency partners. Significant valleylands are also recognized regionally as a component of the Regional Natural Heritage System, and locally as Key Natural Feature within the City of Burlington.

Appleby Creek was not identified as Significant Valleyland in the Appleby Creek Flood Mitigation Class EA (Aquafor Beech Ltd. 2019) or Appleby Creek Erosion Control EA (Aquafor Beech Ltd. 2019). To assess the significance of this valleyland, anp analysis has been provided in **Appendix F** using guidance criteria provided in the *Natural Heritage Reference Manual* (MNR 2010). The findings of this

analysis confirm that the Appleby Creek valleylands do not satisfy the guidance criteria for Significant Valleyland.

4.3.6 Significant Wildlife Habitat (SWH)

Significant Wildlife Habitat (SWH) is recognized as Key Features within the Regional Natural Heritage System. SWH represents a combination of natural heritage features, attributes and functions that are intended to capture the best examples of wildlife habitat within a planning area such as an upper or lower tier municipality. This responsibility for confirming SWH is assigned to the planning authority (i.e., Region); however, municipalities rely upon proponents to identify "candidate SWH" through planning studies.

The City of Burlington and Region of Halton official plans do not provide a definition of SWH, so it is presumed that the PPS definitions applies, which is:

> *Significant: means:* d) *"in regard to other features and areas, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system.*

To determine if any of the ecological features or functions in the study area support candidate SWH, the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF 2015b) were consulted.

According to the *Significant Wildlife Habitat Technical Guide (*MNR 2000), there are four broad categories of Significant Wildlife Habitat (SWH):

- Habitats of Seasonal Concentration Areas of Animals;
- Rare Vegetation Communities or Specialized Habitat For Wildlife;
- Habitat for Species of Conservation Concern; and
- Animal Movement Corridors.

Within each of these categories, there are multiple types of SWH, each of which is intended to capture a specialized type of habitat that may or may not be captured by other existing feature-based categories (e.g., significant wetlands, significant woodlands).

An SWH screening of the Appleby Creek corridor, using the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF 2015b), was included the Appleby Creek Flood Mitigation Class EA (Aquafor Beech Ltd. 2019) and Appleby Creek Erosion Control Class EA (Aquafor Beech Ltd. 2020). The SWH screenings documented several categories of SWH as being present with the larger Appleby Creek corridor, most of which is associated with reaches closer to Lake Ontario.

Beacon has reviewed these SWH screenings within the context of the subject lands with emphasis on potentially applicable SWH categories, namely:

- Bat Maternity Colonies;
- Migratory Butterfly Stopover Areas;
- Landbird Migratory Stopover Areas; and
- Special Concern and Rare Wildlife Species.

These are discussed further below.

Bat Maternity Colonies

Within the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF 2015b), it states that bat maternity colonies considered SWH are found in forested ecosites, including FOD, FOM, SWD and SWM. As per **Section 4.2.1.1** of this report, none of these ecosites are present in the study area.

Migratory Butterfly Stopover Areas

The *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF 2015b) describes migratory butterfly stopover area SWH as a minimum of 10 ha in size with a combination of field and forest habitat present, in which field habitat will include ELC ecosites CUM, CUT and CUS, while forested habitat includes FOC, FOD, FOM and CUP. Although CUM and CUT ELC ecosites are located within the study area, the associated forested habitat required to qualify SWH is missing. As well, the CUT and CUM communities are much smaller than 10 ha in size.

Landbird Migratory Stopover Areas

Within the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF 2015b), it states that land bird migratory stopover areas considered SWH are found in all ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM or SWD, which should be at least 5 ha in size. As per **Section 4.2.1.1** of this report, none of these ecosites are present in the study area.

Special Concern and Rare Wildlife Species

The Appleby Creek Flood Mitigation Class EA (Aquafor Beech Ltd. 2019) stated that Snapping Turtle (SC, S3) has the potential to occur within Appleby Creek. However, Beacon is of the opinion that the Appleby Creek within the study area of this EER/EIA does not provide optimal habitat for turtle foraging and dispersal.

The Flood Mitigation EA (Aquafor Beech Ltd. 2019) noted that Black-crowned Night Heron ("BCNH") was confirmed foraging in Appleby Creek during breeding bird surveys. As detailed in **Section 4.2.2.5** of this EER/EIA, Beacon also observed a BCNH associated with Appleby Creek in April 2019. BCNH were not observed to be nesting or breeding; BCNH were only observed foraging.

As a provincially rare species (i.e., S3B), Black-crowned Night-heron and its habitat qualify as potential candidate SWH.

4.3.7 Significant Areas of Natural and Scientific Interest

Significant Areas of Natural and Scientific Interest are recognized as Key Features within the Regional Natural Heritage System. Regarding Areas of Natural and Scientific Interest (ANSIs), significant is defined by the PPS (2020) as:

> *Areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education.*

There are no ANSIs in the vicinity of the study area. The closest ANSI to the subject lands is the Bronte Creek Provincial Park Nature Reserve Zone which is located approximately 3 km to the northeast.

4.3.8 Fish Habitat

Fish habitat is recognized as a Key Feature of the Regional Natural Heritage System. The PPS (2020) treats all fish habitat equivalently regardless of significance. All water features (i.e., permanent, or intermittent streams, seasonally flooded areas, and natural ponds) are generally considered fish habitat. The PPS applies only to waterbodies that constitute fish habitat, as defined by the *Fisheries Act* (1985).

Appleby Creek supports a fish community and is considered fish habitat. As Rainbow Trout (*Oncorhynchus mykiss*) were recorded during the aquatic investigations, as detailed in **Section 4.2.3.2**, the stream has been classified as a cool-warmwater system. As such, this Key Feature of the Regional Natural Heritage System is present within the study area.

4.3.9 Other Components of the Regional Natural Heritage System

Other Components of the Regional Natural Heritage System include:

- Enhancements to the Key Features (including Centres for Biodiversity);
- Linkages;
- Buffers;
- Watercourses that are within a Conservation Authority Regulation Limit or that provide a linkage to a wetland or a significant woodland; and
- Wetlands other than those considered significant under Section 115.3(1)b of the Regional Official Plan.

A review of ROP Map 1G – Key Features does not identify any enhancement areas, linkages or buffers in the study area. The following is a summary of these other components of the RNHS and whether they occur in the study area.

Enhancements to Key Features are generally identified through an EIA and include measures that can be undertaken within Key Features that improve their ecological resilience and function. This EER/EIA identifies such opportunities.

While the Appleby Creek valleylands do offer some level of linkage function and it is anticipated that these functions will be enhanced as part of the creek rehabilitation works undertaken in relation to this project, the valley is not considered a Linkage of the RNHS. The RNHS is based on the *Sustainable Halton Natural Heritage System Definition & Implementation Report* (NSEI 2009) which describes Local Linkages as being 60-100 m in width and Regional Linkages as 300-400 m in width. The Appleby Creek corridor is less than 40 m in width on average and does not meet the minimum width criteria of a Local Linkage.

Buffers are also identified and recommended through an EIA. This EER/EIA identifies ecologically appropriate buffers to Fish Habitat.

Appleby Creek is a watercourse that is regulated by Conservation Halton and therefore represents a component of the RNHS.

A small non-significant wetland community (ELC Unit 4) occurs on the floodplain of Appleby Creek. This wetland is regulated by Conservation Halton and therefore represents a component of the RNHS.

5. Constraints and Opportunities

The purpose of the constraint analysis is to identify biophysical features and functions that could present constraint to the redevelopment of the subject lands. The identification of both physical and natural heritage constraints to development is primarily necessary to guide the design and servicing of the proposed development to avoid or minimize impacts to Key Features of the Regional Natural Heritage System within or adjacent to the subject lands. Addressing constraints to development can also present opportunities for both mitigating impacts and enhancing Key Features of the Regional Natural Heritage System, thereby providing a foundation for a sustainable community.

The physical and biological / natural heritage constraints to development identified through this study are described in **Section 4.1, 4.2** and **4.3**. The natural heritage constraints are illustrated in **Figure 7**. In order to facilitate redevelopment on the subject lands, grading in the Appleby Creek valley is proposed with the purpose of containing the floodplain within the valley corridor, which is illustrated on **Figure 8**. It was acknowledged by the Appleby Creek Erosion Control EA (Aquafor Beech Ltd. 2020) that such grading could be considered as part of the re-development of the Oval Court Lands.

Constraints to development consist of hazard lands, significant ecological features (i.e., the NHS) and their associated setbacks and buffers that are excluded from development in accordance with applicable policies are described below. Opportunities to development are also provided within this section.

5.1 Physical Constraints to Development

Physical constraints to development are related to surface and groundwater features and areas, and include setbacks related to natural hazards (e.g., floodplain and stable top of bank) in the landscape. The following physical constraints related to the study area are summarized in **Table 7.**

The extent of the various constraints has been determined based on a combination of site-specific assessments (**Section 4**), and application of the appropriate policies (**Section 2**).

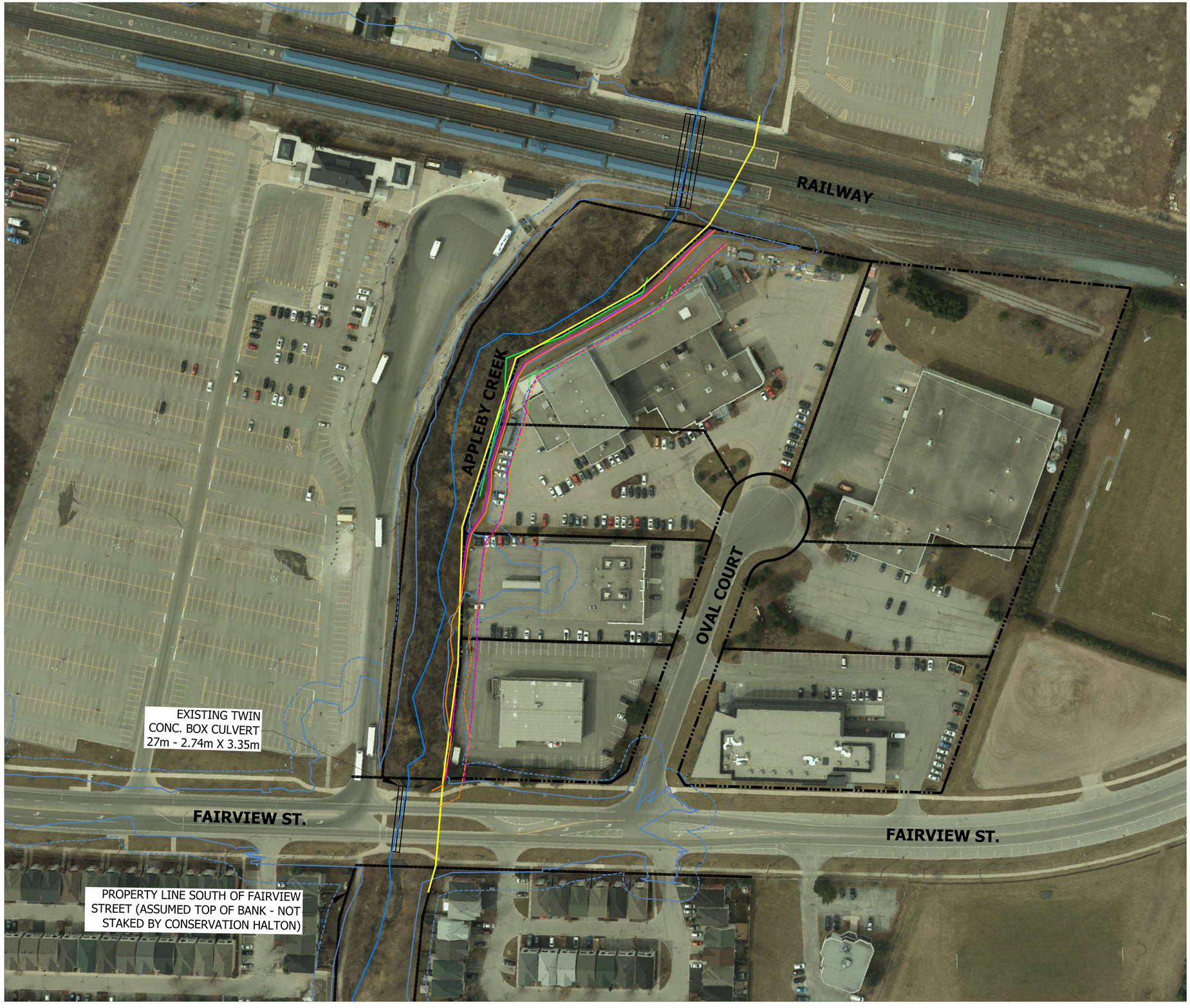
Table 7. Summary of Physical Constraints to Development

Category	Constraints to Development
Watercourses	Appleby Creek is located adjacent to the subject lands and is considered a minor watercourse system by Conservation Halton and represents a constraint to development. Generally, **no development or site alteration is permitted within a watercourse**; although crossings of watercourses and realignments of watercourses may be permitted provided a study is completed to address environmental impacts and the necessary permits are obtained from Conservation Halton, DFO and/or MNRF.
Erosion (Slope) Hazard	Top of Slope of the eastern side of the Appleby Creek valley was staked by Conservation Halton on October 19, 2018. DS Consultants Ltd. subsequently established the position of the existing Long Terms Stable Top of Slope as well as the future LTSTOS that will result from the proposed valley cut to mitigate flooding. According to Policies 2.1 and 2.2 of the Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document (Conservation Halton 2020), **development is generally prohibited within 7.5 metres of the stable top of bank of a minor valley system**.
Floodplain Hazard	The existing Regional floodplain of Appleby Creek extends onto the subject lands, as well as Fairview Street and the Appleby GO Station property. This flooding hazard was identified in the Appleby Creek Flood Mitigation Class EA (Aquafor Beech Ltd. 2019). Urbantech Consulting (2023) worked with the recommendations set out by this EA as well as the Appleby Creek Erosion Control EA (Aquafor Beech Ltd. 2020) to facilitate development of the subject lands. Therefore, a proposed Regional floodline has been established which will be contained within the Appleby Creek valley as a result of grading on the eastern bank. According to Policies 2.1 and 2.2 of the Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document (Conservation Halton 2020), **development is generally prohibited within 7.5 metres of the floodplain of a minor valley system.** As per CH Policies 2.19.1 and 2.19.2, this proposed grading was identified as a potential approach to flood plain management within the City's Appleby Creek Flood Mitigation Class EA (Aquafor Beech Ltd. 2019) and, as such, can be advanced through this proposed development application.

5.2 Natural Heritage Constraints to Development

Natural heritage constraints associated with the study area are related to protected features (i.e., watercourse, fish habitat and wetland) and related ecological buffers and natural hazard setbacks and are included in the Regional Natural Heritage System**.** The extent of the various constraints has been determined based on a combination of site-specific assessments (**Section 4**), and application of the appropriate policies (**Section 2**).

A summary of the Regional Natural Heritage System components and the extent to which they constrain future development on the subject lands is provided below in **Table 8.**





LEGEND

- EX. FLOOD LINE (BY URBANTECH CONSULTING, 2023)
- EX. FLOOD LINE SETBACK - 7.5 m
- EX. PHYSICAL TOP OF SLOPE (STAKED BY CONSERVATION HALTON, OCT.19. 2018) AND LONG-TERM STABLE TOPS OF SLOPE (DS CONSULTATNTS LTD. 2020)
- EX. TOP OF SLOPE SETBACK - 7.5 m
- PRELIMINARY DRIPLINE (STAKED BY REGION OF HALTON, OCT. 19, 2018)
- PRELIMINARY WOODLAND BUFFER - 10 m
- LIMITS OF REGIONAL NATURAL HERITAGE SYSTEM (ROPA 38 MAP 1)

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes, Do not scale

Nº	REVISIONS	DATE:	BY:
6			
5			
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3			
2			
1			

SEAL

NOT FOR CONSTRUCTION UNLESS SIGNED & DATED

SEAL

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BEACON ENVIRONMENTAL

PROJECT

OVAL COURT
CITY OF BURLINGTON

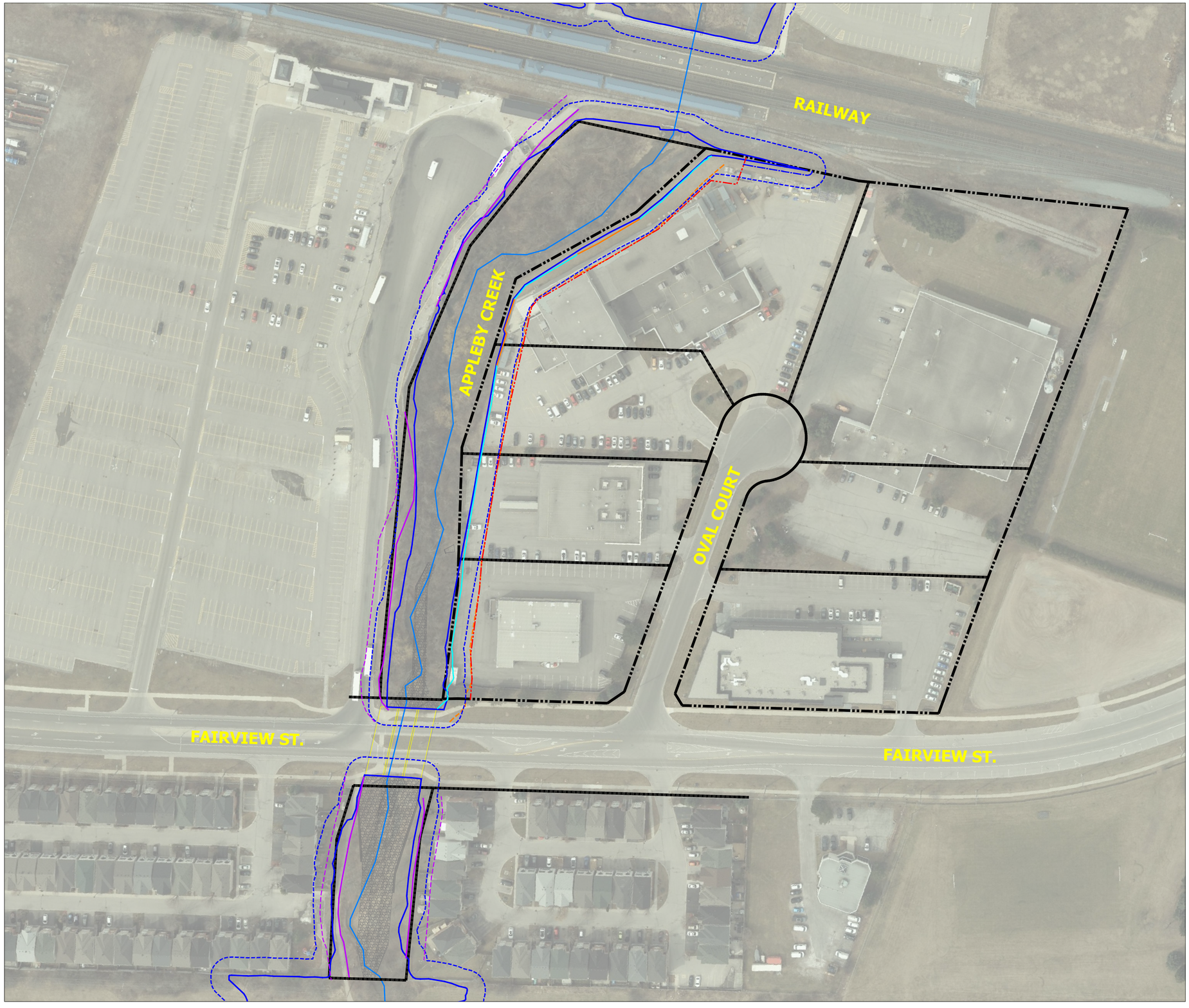
SHEET TITLE

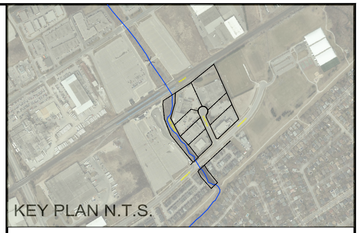
CONSTRAINTS MAP
(EXISTING CONDITIONS)

DESIGN BY:	PROJECT Nº: 218416
DRAWN BY: JK	FIGURE Nº: FIG. 7
CHECKED BY: SG	
DATE: 07 March 2023	
SCALE: 1:750	

2023-02-14_Oval Court_Constraints Map_218416.dwg

2020-11-26





LEGEND

- EX. PROPERTY BOUNDARY
- PR. FLOOD LINE (BY URBANTECH CONSULTING, 2022)
- PR. FLOOD LINE SETBACK - 7.5 m
- PR. SETBACK TO UNDERGROUND PARKING - 2.0 m
- PR. LONG-TERM STABLE TOP OF SLOPE (BY URBANTECH CONSULTING AND DS CONSULTANTS LTD., 2020)
- EX. PHYSICAL TOP OF SLOPE (STAKED BY CONSERVATION HALTON, OCT. 19, 2018) AND LONG-TERM STABLE TOP OF SLOPE (DS CONSULTANTS LTD., 2020)
- PR. LONG-TERM STABLE TOP OF SLOPE SETBACK - 7.5M
- EX. PHYSICAL TOP OF SLOPE (STAKED BY CONSERVATION HALTON, JULY 2023)
- EX. TOP OF SLOPE SETBACK - 7.5M
- PR. PROPERTY LINE

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes, Do not scale

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SEAL

NOT FOR CONSTRUCTION UNLESS SIGNED & DATED

SEAL

NOT FOR CONSTRUCTION UNLESS SIGNED & DATED

BEACON ENVIRONMENTAL

PROJECT

OVAL COURT
CITY OF BURLINGTON

SHEET TITLE

CONSTRAINTS MAP
(PROPOSED CONDITIONS)

DESIGN BY:	PROJECT Nº: 218416
DRAWN BY: JK	FIGURE Nº: FIG. 8
CHECKED BY: KU	
DATE: November 2023	
SCALE: 1:750	

2020-11-26 2023-11-09_Oval Court_Constraints Map_218416.dwg

Table 8. Summary of Natural Heritage Constraints to Development

Category	Constraints to Development
Fish Habitat	S. 118.2(a) of the Region's Official Plan (2018) prohibits development and site alteration within fish habitat except in accordance with applicable Federal legislation or regulations. The portion of Appleby Creek that is within the study area is considered coolwater fish habitat. Conservation Halton (2020) generally recommends a 30 m development setback to coolwater fish habitat; however, it was agreed during the preparation of the EER/EIA ToR that the determination of an appropriate setback would be determined by the EER/EIA and that it would consider a number of parameters. Based on comments received from the Region on March 30, 2023, the Region has confirmed that a buffer to coolwater fish less or greater than 30 m may be recommended by an EIA. As it relates to the current redevelopment proposal, the EER/EIA has determined that from an ecological perspective a 30 m buffer is unwarranted for the reasons provided below: 1. Application of a 30 m fisheries buffer to this reach of Appleby Creek is excessive and disproportional, as most of the valleyland itself less that 30 m in width. 2. To our knowledge, a 30 m fisheries buffer have never previously been applied to developments along Appleby Creek within the City's urban boundaries. 3. The fish communities within Appleby Creek have persisted over the long-term with vegetated buffers that are much less that 30 m. 4. The existing developments adjacent to Appleby Creek have little to no stormwater quality controls and stormwater outfalls mostly discharge directly to the creek and bypassing vegetation that could perform important buffering functions such as sediment and contaminant removal (see **Photograph 5** for example). 5. The vegetated area between Appleby Creek and the limits to existing development on the subject property varies from 3.13 m to 11.96 m (average of 6.95 m). 6. The existing vegetation throughout much of the valleylands adjacent to the subject property is dominated by invasive Common Buckthorn which prevents groundcover vegetation from establishing and therefore limits the potential to provide buffer functions. 7. The future limits for the proposed redevelopment will be established at between 14.25 m and 20.98 m (average of 18 m) from the creek bankfull. This will provide a for a vegetated area that is 3 times the width of what currently exists. 8. Much of this area will be revegetated with native trees, shrubs and groundcovers as part of the re-development proposal and provide for greater buffering capacity than currently exists. 9. In our opinion, a minimum fisheries buffer of 10 m from the creek bankful is adequate in this setting as it is proportional to the scale of the valleyland and consistent with other locations along Appleby Creek. 10. The redevelopment proposal will provide a variable buffer that is 18 m in width on average and comprised of enhanced vegetation cover to provide improved buffering as well as other ecological benefits.

Category	Constraints to Development
	In addition to the fisheries buffer, there are additional measures that will be implemented as part of the proposed redevelopment that will improve and enhance the condition of fish habitat along this reach of Appleby Creek. The proposed redevelopment will provide a natural, vegetated valley slope along a portion of the east side of Appleby Creek. Through this proposed work, the redevelopment aims to enhance the riparian vegetation community by replacing invasive non-native plants with native vegetation that will provide higher quality allochthonous material to the aquatic ecosystem, as compared to existing conditions. The proposed stormwater management strategy shall also improve the quality of runoff using a treatment train approach. A clean water biofiltration system will collect runoff from a greenspace at the north end of the property and outlet to the creek. Sediment and erosion control will be mitigated using Best Management Practises (BMPs). It is also anticipated that the City will be improving the creek channel to rectify existing erosion issues which will help improve conditions in other areas of this valley.
Other Wetlands	S. 118.2(b) of the Region's Official Plan (2018) prohibits development and site alteration within wetlands not considered to be significant at the provincial or regional level unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions. One riparian wetland (ELC Unit 4) is present within the study area. The wetland is under 0.5 ha in size and is not considered significant at the provincial or regional level. The Region's Official Plan (2018) does not prescribe buffers for wetlands, however Conservation Halton (2016) requires a **15 m buffer from wetlands less than 2 ha in size** provided the wetland is not Provincially Significant. This wetland is located more than 15 m away from the greatest constraint shown on Figure 8, so no buffer has been illustrated.



Photograph 5. Existing Stormwater Outlet on East Valley Wall that Discharges Directly into Appleby Creek

5.3 Opportunities for the Enhancement of Key Features of the Natural Heritage System

The proposed redevelopment presents several opportunities for enhancement of the existing natural environment and associated ecological functions.

Opportunities identified include:

- Improving quality of surface runoff by implementing LID measures and erosion mitigation in an area of existing development that currently has no stormwater quantity or quality controls;
- Removing existing fill, waste and debris from the valleyland;
- Managing non-native invasive species in the valleyland;
- Introducing habitat structures for birds, bats and reptiles in the valleyland and buffer;
- Providing enhanced level of diversification plantings within the valleyland and buffer;
- Planting Milkweed (*Asclepias syriaca*) within the buffer zone to provide habitat for Monarch; and
- Providing a naturalized valley slope on the east side of the creek rather than the hardened armourstone wall that is identified in the City's Erosion Control EA preferred design alternative.

6. Description of the Redevelopment Proposal

6.1 Site Plan

The proposed Site Plan (Core Architects Inc. 2023) proposes that the subject lands will be redeveloped into six blocks with eight (8) high-rise buildings ranging between 11 and 30 storeys upon shared podiums and a shared 3 storey underground parking garage that will extend to the north, east, and south property lines, and to within 1 m of the western limit of development. Along the northern property line, the underground parking will extend into Conservation Halton's 7.5m regulatory allowance adjacent to the Regional Storm flood plain. The parking garage has been offset a minimum 2.0 m from the flood line.

Land uses include residential, commercial (office and retail), landscaped areas, a daycare and a library. Additionally, a trail system is proposed between Sherwood Forest Park and the Centennial Bikeway, and pedestrian promenade will provide access to Sherwood Forest Park. A rail crash berm is proposed on the northern end of the subject lands as required by Metrolinx.

The proposed redevelopment will be accessed through one entrance on Fairview Street.

To allow for phasing of the development, each block will have its own on-site SWM controls and individual storm, sanitary, water, and utility connections (Urbantech Consulting 2023).

The Site Plan prepared by Core Architects Inc. (Drawing A-101) is included as **Figure 9**. This Site Plan includes a pedestrian span bridge over Appleby Creek, which is discussed in **Section 6.1.1** below.

6.1.1 Bridge to Appleby GO Station

A pedestrian bridge over Appleby Creek is proposed to connect the community to the transit station as shown in the Site Plan (Core Architects Inc. 2023). The proposed pedestrian bridge has been included as part of this redevelopment proposal to provide for an active transportation link to the transit station as envisaged in the Draft Precinct Plan for the Appleby GO Station Mobility Hub, dated May 2018. The potential for this pedestrian crossing was not assessed during the Erosion Control or Flood Mitigation EAs.

To minimize impacts to the valleylands, a prefabricated steel span bridge design has been proposed that can be installed on abutments located outside the valley and floodplain. This type of bridge can be constructed with minimal disturbance to the valleylands and creek. The end abutments are constructed outside the valley and floodplain and the bridge is craned in and fastened, thereby avoiding disturbance to the creek or valley slopes. Some trees in the valleylands under or immediately adjacent to it would need to be removed or pruned to not interfere with the installation and can be replaced. Refer to the Arborist Report (Beacon 2023) for more detail regarding potentially affected trees. Furthermore, the span will be elevated allowing the area under the bridge to be revegetated. Similar pedestrian span bridges have been approved by CH and installed across other creeks in Halton Region with minimal impact, including more sensitive watercourses that support habitat for endangered Redside Dace.

APPLEBY GO STATION

BRIDGE TO APPLEBY STN

30m SETBACK FROM RAIL LINE ADJACENT PROPERTY LINE

NATURAL HERITAGE SYSTEM

PH1

PH2a

PH2b

PH3

PH4

PH5

PH6

SHERWOOD FOREST PARK

LANDSCAPED OPEN SPACE

UFG GARAGE BELOW

EARTHEN BERM

30.00 m SETBACK

2.43m HIGH CHAIN-LINK FENCE

3.0m NOISE WALL AT TOP OF EARTHEN BERM

STANDARD 2.5m EARTHEN BERM START

EXIT STAIR POP UP

EXISTING TREE TO BE RETAINED

CRITICAL ROOT ZONE

BUILDING A
(19 STOREYS)
62.25m + 6.5m MPH
202 APARTMENTS

BUILDING B
(19 STOREYS)
62.25m + 6.5m MPH
202 APARTMENTS

BUILDING C
(30 STOREYS)
98.00m + 6.5m MPH
340 APARTMENTS

BUILDING D
(30 STOREYS)
98.00m + 6.5m MPH
303 APARTMENTS

BUILDING E
(30 STOREYS)
98.00m + 6.5m MPH
315 APARTMENTS

BUILDING F
(11 STOREYS)
36.25m + 6.5m MPH
142 APARTMENTS

BUILDING G
(19 STOREYS)
62.25m + 6.5m MPH
222 APARTMENTS

BUILDING H
(19 STOREYS)
62.25m + 6.5m MPH
262 APARTMENTS

FIRE ROUTE
THE PROMENADE

OVAL COURT

7.0m PRIVATE ROAD

FAIRVIEW STREET

PODIUM SEPARATION

LOADING ENTRY

PARKING ENTRY

RETAIL ENTRY

RESIDENTIAL ENTRY

LIBRARY ENTRY

DAYCARE ENTRY

OFFICE ENTRY

KIDS PLAY AREA

OVAL COURT PLAZA

LANDSCAPED OPEN SPACE

3m X 3m VISIBILITY TRIANGLE TYP.

1.5m PEDESTRIAN WALKWAY

PROPOSED PROPERTY LIMIT

7.5m SETBACK FROM GREATER OF PROPOSED / EXISTING STABLE TOP OF BANK GREATER OF PROPOSED / EXISTING STABLE TOP OF BANK

PROPOSED FLOOD LINE SETBACK - 7.5m

PROPOSED FLOOD LINE

9m x 9m MUNICIPAL VISIBILITY TRIANGLE

DASHED LINES DENOTE EXTENT OF ROAD BELOW

EXISTING SIDEWALK TO BE RETAINED

37.18 m TO RESIDENTIAL ZONE

LEGEND

HATCH INDICATES FIRE ROUTE

SURVEY LEGEND

INFORMATION BELOW PROVIDED BY URBANTECH (AUGUST 03, 2023)

- PROPOSED PROPERTY LIMIT
- GREATER OF PROPOSED/EXISTING STABLE TOP OF BANK
- 7.5m SETBACK FROM GREATER OF PROPOSED/EXISTING STABLE TOP OF BANK
- PROPOSED FLOOD LINE
- PROPOSED FLOOD LINE SETBACK - 7.5m

NO.	REVISIONS	DATE
3	ISSUED FOR COORDINATION	25 AUG, 2023
2	RE-ISSUED FOR ZBA/OPA	17 MAR, 2023
1	ISSUED FOR ZBA/OPA	14 MAY, 2021

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WITHOUT PREJUDICE

OVAL COURT

720, 735, 740 Oval Ct. & 5135, 5155 Fairview St.
Burlington ON, L7L 6A9

N

DRAWN: KP	SCALE: 1 : 500
CHECKED: CW	DATE: JULY 28, 2023

TITLE: SITE PLAN — **FIGURE 9**

PROJECT NO.	DRAWING NO.
20-145	**A-101**

As it relates to impacts, it is important to note that the Appleby Creek Erosion Control EA has proposed comprehensive rehabilitation work for this reach of the creek and that, based on the conceptual drawings within the final EA, these works will require removal of existing trees and vegetation throughout the valley to implement a new channel design and associated bank protection. It is understood that the Appleby Creek erosion works are proposed to be undertaken soon and that elements such as the proposed pedestrian bridge and can be accounted for in the City's design.

Impacts and mitigation related to the proposed bridge are discussed in **Section 7**.

6.2 Site Servicing

The descriptions provided in these sections are based on the *Functional Servicing and Stormwater Management Report* (herein referred to as the FSR/SWM Report; Urbantech Consulting 2023) provided under separate cover. For more details, please refer directly to the FSR/SWM Report Urbantech Consulting (2023).

6.2.1 Water and Sanitary

The subject lands are currently serviced through existing infrastructure on Oval Court and Fairview Street. It is proposed that some of the existing infrastructure be upgraded to support the increased capacity of the redevelopment. Each block will have its own on-site sanitary and water connections, and each tower will have its own water and sanitary servicing.

Water servicing is provided by the existing 300 mm municipal watermain in Oval Court, with appropriately sized fire service with a domestic service tee for each tower. The municipal watermain will be extended northerly to accommodate the proposed road extension. An external 300mm watermain will be installed that interconnects the existing 300mm watermain on Fairview Street to an existing 350 mm at Harvester Road.

The existing sanitary sewer on Oval Court will be reconstructed to suit the needs of the development.

The sewer will connect to the existing manhole and trunk sanitary sewer on Fairview Street.

For further details, refer to Servicing Plan Drawing SS-1 in the FSR/SWM Report (Urbantech Consulting 2023).

6.3 Stormwater Management

The existing development was designed with no formal stormwater quality or quantity controls. Stormwater from the existing development is released to Appleby Creek via four outlets – 3 small outlets north of Fairview Street and one main outlet south of Fairview Street. The proposed stormwater management system for the redevelopment has been designed to meet City of Burlington 2020 Stormwater Management Design Criteria in terms of quality and quantity control, water balance and erosion control.

6.3.1 Stormwater Quantity Control

Section 4.5.1 of the FSR/SWM Report (Urbantech Consulting 2023) outlines how stormwater quantity control will be addressed within the subject lands. All flows from the site, regardless of outlet, will enter Appleby Creek via the storm sewer system or direct overland flow. Overall, the FSR/SWM Report (Urbantech Consulting 2023) identified a flow reduction from the site to the Appleby Creek system for all modelled storm events.

Per the City of Burlington 2020 Stormwater management Design Criteria, the following stormwater quantity control criteria will be met with the proposed design:

- All flows draining to Appleby Creek will match post-development to pre-development flows for the 2-year to the 100-year storm return periods;
- For redevelopment sites, a maximum imperviousness of 36% may be applied (equivalent to a runoff coefficient C = 0.5) in cases where the flows discharge to a storm sewer; and
- All flows discharged to the storm sewer on Oval Court will control the 100-year post development storm flows to the available sewer capacity (5-year storm at 85% maximum) within the receiving Fairview Street sewer. Based on the assessment of existing infrastructure, it was determined that the allowable release rate from the proposed Oval Court lands directed to the storm sewer is 0.4 m^3/s. Control to this target during the 100-year event will ensure no increases to the Fairview Street flows. This represents an improvement to the overall storm sewer system, as currently there are no SWM controls on the subject lands and the 100-year storm likely discharges onto the Oval Court and Fairview Street ROW with no controls.

Stormwater quantity control will be provided by six (6) underground storage tanks within the underground parking structure for flows from the development being directed to the Oval Court. All storm tanks are pumped such that there is a 24-hour release rate during the 4-hour 25 mm event. The existing storm sewer on Oval Court will be reconstructed as a 450mm to 600mm to accommodate the needs of the redevelopment proposal. The proposed sewer is designed to convey 100-year controlled flows from each of the development blocks.

Based on the above, the proposed stormwater management approach will remove the three stormwater outfalls from the creek corridor, immediately west of the subject lands and direct the majority of drainage from the subject lands into a new outfall, in approximately the same location as the existing outfall, within the upgraded Fairview Street culvert crossing. This represents an improvement from existing conditions through the removal of infrastructure from within the creek corridor and addresses a concern raised by CH through their review of the first submission.

In order to address water balance, a biofiltration gallery (see **Section 6.4**) is proposed at the northern limit of the subject lands. This gallery will direct clean drainage to Appleby Creek immediately downstream of the rail line and will serve to supplement low flows to the creek to replace some of the flows removed as a result of combining the existing outfalls.

For further details, refer to the FSR/SWM Report (Urbantech Consulting 2023).

6.3.2 Stormwater Quality Control

As outlined in Section 4.5.2 of the FSR/SWM Report, to achieve MECP "enhanced" level water quality protection (80% TSS removal), oil/grit separators (OGS) will be implemented on each phase, except for Phase 3. Phase 3 does not have any driveway surfaces. All phases will implement the Jellyfish Filter System, which is ETV certified for 88% TSS removal. Model JF4-2-1 is proposed for Phase 2, whereas Model JF4-1-1 is proposed for Phases 1, 4, 5, and 6. The SWM tanks are designed to have two inlets to separate clean roof from surface runoff. The OGSs are placed upstream of all SWM tanks and will treat surface water. All uncontrolled flows from landscaped areas and sidewalks are considered to be clean and as such no treatment is proposed.

Based on the above, the proposed stormwater management approach will result in improved water quality to Appleby Creek through the provision of on-site quality controls in an area that currently has no quality controls.

For further details, refer to the FSR/SWM Report (Urbantech Consulting 2023).

6.4 Site Water Balance

Conservation Halton recommend that pre-development to post-development water balance be met for the proposed development. The City of Burlington design criteria for water balance indicates that the first 5 mm of runoff be retained on site using acceptable LID practices. As described in Section 4.5.3 of the FSR/SWM Report (Urbantech Consulting 2023), for the 4.23 ha of the site area being developed, 211.5 m^3 of water is required to be retained, which equates to an annual requirement of 15,968 m^3/year.

A Hydrogeologic Assessment was prepared by DS Consultants Ltd. (2020) which indicated an unmitigated annual water balance deficit of 2,145 m^3/year. As infiltration design is not feasible due to the full coverage nature of the underground parking structure, filtration through LID's is proposed rather than infiltration.

6.4.1 Water Balance Measures

As outlined in Section 4.5.3 of the FSR/SWM Report (Urbantech Consulting 2023), measures that can be implemented to achieve the water balance objectives include implementing a combination of potential green roofs, roof top storage to enhance evaporation, irrigation, reuse opportunities and potential passive infiltration within the buffer of Appleby Creek. All storage tanks are designed to account for the storage equivalent to the 5 mm capture target. The end use of this water and refinement of the required sump storage will be determined at detailed design. Water balance calculations provided in Appendix C of the FSR/SWM Report (Urbantech Consulting 2023) identify an annual on-site retention of 4,679 m^3/year though the use of green roofs and the biofiltration gallery which exceeds the annual deficit. The biofiltration gallery is proposed at the northern limit of the subject lands. This gallery will direct clean drainage to Appleby Creek immediately downstream of the rail line. Design of the biofiltration gallery, including the transition of released flows to Appleby Creek will be explored further at detailed design.

6.4.1.1 Erosion Control

City of Burlington erosion control criteria are based on the 4-hour, 25 mm event for a minimum of 24 hours. The propose SWM tanks for all phases will have the 25 mm storm event pumped at a drawdown time of 24 hours to achieve extended detention. The pump will discharge flows to the storm service maintenance hole, located adjacent to the right of way in the private property. Pump details will be coordinated by the mechanical engineer during the detailed design stage. In addition, the overall 4-hour, 25 mm event flow to Appleby Creek under proposed conditions is 61% less than under existing conditions.

6.5 Site Grading

As outlined in Section 3.1 of the FSR/SWM Report (Urbantech Consulting 2023), the site grading design considers the following objectives and constraints:

- Conform to City of Burlington grading criteria;
- Match existing boundary conditions;
- Provide emergency overland flow conveyance for major storm conditions; and
- Provide minimum cover on proposed servicing.

The proposed grading plan (Drawing GR-1) generally matches all boundary conditions resulting in minor uncontrolled flows existing the site. The uncontrolled flows have been accounted for in the stormwater management design.

A 2.5 m high earthen berm (crash berm) will be constructed along the north boundary of the development as required by Metrolinx for noise and safety purposes. No grading is proposed on Metrolinx lands and no additional flows will be directed to Metrolinx lands. The northern side of the berm is graded towards Metrolinx lands, and surface drainage will eventually enter Appleby Creek via the existing ditch on the south side of the tracks.

The west limit of development will tie into the proposed Appleby Creek corridor grading design, whereas the grading along the south property line will consist of proposed urbanized boulevards along Fairview Street. Due to the existing topography of Sherwood Forest Park, minor transitional grading is proposed on park lands to match existing conditions and avoid the use of retaining walls.

6.6 Appleby Creek Valley Corridor Grading

As discussed in **Section 5.1** of the FSR/SWM Report (Urbantech Consulting 2023), under existing conditions, private and public property located in the vicinity of Appleby Creek and Fairview Street is impacted by the Regional Storm floodplain. To contain the Regional Storm floodplain within the corridor, a minor widening / re-shaping of the eastern corridor slope, essentially creating a new “top of slope” along the corridor, is proposed. In addition to the proposed grading works, replacement of the existing Fairview Street crossing structure with a new crossing structure is proposed. The proposed corridor grading and culvert improvement works address recommendations from the Appleby Creek Flood Mitigation Class EA (Aquafor Beech Ltd. 2019) and will remove flooding from the subject lands, as well

as provide safe access/egress for the subject lands as well as existing residential development east of Appleby Creek through the elimination of the overtopping at Fairview Street.

As discussed in **Section 3.1**, the Appleby Creek corridor will be redesigned to eliminate flooding outside of the valley corridor and to mitigate erosion along a portion of the east side of the corridor. The Erosion Control EA (Aquafor Beech Ltd. 2020) describes the preferred design for this reach of Appleby Creek as follows:

> *Apply reach-scale bank and bed protection works (approximately … 300 m at Erosion Site 7B), including removal of existing gabion baskets, installation of armourstone retaining wall, roundstone riffle-pool features and in-creek vegetation buffer, retrofit of existing storm outfall into the restorative bank works. The integrated channel widening design between Fairview Street and Metrolinx Corridor would allow for flood relief, which will also tie into the recommendation from the Appleby Creek Flood EA study (i.e. widen the Fairview Street bridge). Slopes above the armourstone wall will be restored with native trees and shrubs*

A comparison of the proposed approach relative to the approved EAs is provided in **Table 9** below.

Table 9. Comparison of Proposed Works- Appleby Creek Adjacent to Subject Lands

	Flood Mitigation EA	Erosion Control EA	Oval Court Re-Development
Proposed Works	Preferred Alternative – replace the existing Fairview Street crossing with a structure that will convey the 100 year storm; Regional Storm would continue to overtop Fairview Street; some localized watercourse realignment and valley widening required at the tie in points upstream and downstream of the new crossing. The existing stormwater outfalls within / adjacent to the Fairview Street crossing would need to be re-constructed as part of the crossing works.	Preferred Alternative – re-construct the watercourse from the railway line southerly to the gas pipeline (south of Fairview Street); line valley along both sides with armourstone; localized plantings between the armourstone and adjacent property lines; all work to be completed within the existing City-owned creek block limits. All existing stormwater outfalls (private and public) to Appleby Creek would remain and would have to be re-constructed as part of the creek works.	Widen a portion of the Appleby Creek valley, on the east side of the valley; replace the existing Fairview Street crossing with a structure that will convey the Regional Storm; localized watercourse realignment, grading, and the implementation of retaining walls upstream and downstream of the new crossing; remove existing private stormwater outfalls on the east side of the creek and replace with one consolidated stormwater outfall at Fairview Street and create one biofiltration facility outfall in the valley and, construct a pedestrian crossing of the valley; create a natural valley slope (in area of valley widening) and restore with native vegetation; pedestrian crossing to be a span entirely outside of flood plain and valley.
Timeline	Crossing not anticipated to be replaced within the next 50 years	City has advised that they will be initiating the tender process for the detailed design work in	Dependent upon planning and permit approval process; goal is to implement within next 5 years

	Flood Mitigation EA	Erosion Control EA	Oval Court Re-Development
		the coming months; works are within the City's capital budget	
Impacts to RNHS	Crossing is within the RNHS; watercourse realignment to facilitate tie-ins upstream and downstream of crossing would temporarily impact fish habitat; removal of instream fish barrier upstream of crossing; potential for impact to potential candidate SWH (Black-crowned Night Heron) These works are anticipated to have negative impact to the valleyland over the short-term but a positive impact over the long-term.	Removal of 'other wetland' immediately south of the railway line to facilitate the re-creation of the low flow channel; temporary impacts to fish habitat through the re-creation of the low flow channel; impacts to potential candidate SWH (Black-crowned Night Heron). Potential for re-vegetation within the valley corridor appears limited based on conceptual drawings provided in the EA. These works are anticipated to have negative impact to the valleyland over the short-term but a positive impact over the long-term.	Replacement of Fairview crossing – similar to those proposed in Flood Mitigation EA. Crossing details are to be further investigated at detailed design, at which time efforts will be made to minimize the use of retaining wall associated with the Fairview Street crossing, to the extent possible, while providing a wider flood plain. Widening of eastern side of the lower portion of the Appleby Creek valleylands to address erosion will result in temporary removal of existing vegetation cover that will be replaced with higher quality native species. The area that will be affected is localized and smaller than the area that would be affected by works proposed for the Erosion EA. The creation of a slope as opposed to use of armourstone will result in a wider valley form with more opportunities for naturalization. Additionally, removal of the three existing outfalls will also allow for more naturalization. A pedestrian span bridge has also been proposed in the northern part of the valley to provide for connectivity between the redevelopment and the Go Station. It is anticipated that impacts of the bridge installation will be limited to a localized area around the bridge abutments which will be located outside the floodplain and slope. (see Section 6.1.1 for further detail.) These works are anticipated to have negative impact to the valleyland over the short-term but

	Flood Mitigation EA	Erosion Control EA	Oval Court Re-Development
			a positive impact over the long-term.

It should be noted that removal and replacement of the existing Fairview Street crossing structure will require in-water works. South of Fairview Street, localized grading is proposed along the corridor. To optimize the corridor bottom width and transition from the proposed structure to existing topography, armourstone retaining walls are proposed. Existing stormwater outfalls that currently outlet to Appleby Creek along the south side of Fairview Street via headwall structures will be integrated into the replacement structure. North of Fairview Street, localized grading and implementation of an armourstone retaining wall are proposed along the west side of the creek to optimize the corridor bottom width, as well as the transition between the existing watercourse and the culvert inlet.

Crossing details are to be further investigated at detailed design to confirm that there are no crossing conflicts between the proposed culvert structures and other servicing, utilities, etc. As noted earlier, the City's Flood Mitigation EA also contemplated grade changes upstream and downstream of the culvert crossing to accommodate the installation of the new crossing structure.

Refer to Drawings CH-3 to CH-6 (Urbantech Consulting 2023) for the proposed corridor grading plan.

7. Impact Assessment and Mitigation

This EER/EIA assesses the potential impacts of the proposed development (as described in **Section 6**) on the Regional Natural Heritage System that is on and within 120 m of the subject lands. The proposed redevelopment will result in a transition from the existing industrial/business uses along Oval Court to high-rise residential development. The proposed redevelopment will also result in a widening of a portion the creek valley corridor. Given the degraded state of the existing creek corridor adjacent to the subject lands, there are significant opportunities to improve the condition of the creek corridor through redevelopment while also incorporating mitigation measures into the design of the development to ensure that the change in land use does not have a negative impact on Key Features and functions of the RNHS.

The impact assessment speaks to the impacts of anticipated tree removals related to the flood mitigation work, pedestrian bridge and redevelopment. That stated, tree removals would take place regardless of whether this proposed redevelopment proceeds based on the City's preferred alternative as outlined in the Erosion Control EA. Similarly, the City's Mobility Hub background studies have identified the need for a pedestrian crossing to connect the subject lands to the Go Station.

To help assess potential impacts associated with the proposed development and to evaluate the short and long-term effects on the biophysical environment, an impact assessment matrix was developed to provide a framework for assessing impacts in accordance with the EER/EIA Terms of Reference (**Appendix A**).

The impact assessment matrix is organized by technical discipline (e.g., hydrogeology, hydrology, terrestrial and aquatic ecology, etc.). It describes the significant features and functions to be protected,

identifies the potential impacts associated with the proposed development, recommends measures to avoid or mitigate anticipated impacts, and makes determinations on the expected net/residual impacts.

One of the primary objectives followed in designing the proposed development was to protect the NHS features and functions. Since impact avoidance is generally the most effective means of reducing the risk of development impacts on the natural environment, it is recommended that development limits be established outside of any significant natural heritage features.

As with the other components of this EER/EIA, an integrated multi-disciplinary approach has been applied to assessing the potential impacts of redeveloping the subject lands.

The impact assessment matrix presented in **Table 10** is structured to:

- Identify the specific development activity (impact source);
- Describe the potential effect on environmental receptors (features and functions);
- Recommend mitigation measures to address potential impacts; and
- Describe the net effect on the biophysical environment.

Table 10. Impact Assessment Matrix

Category	Feature/Function	Proposed Activity	Potential Impacts	Recommended Mitigation	Residual Effects
Geology	**Bedrock Geology**	Rehabilitation of Valley Slope	Shale may be encountered during the Appleby Creek slope grading.	The detailed design will identify the potential requirement for over-excavation in the event shale is encountered and will identify the desirability of adding alluvium or other compounds.	Neutral
	Surficial Geology/ Physiography/ Topography	Site Preparation and Grading	The tableland portion of the site is flat and overlain with a thick layer of asphalt and fill on top of a cohesive deposit of clayey silt till and clayey silt till/shale complex. The proposed grading will not significantly alter the topography of the landscape on the table lands, however, the proposed grading to adjust the floodplain will affect the topography along the eastern valley wall.	Existing grades along property lines, and along the outer edge of buffers, will be matched under post-development conditions to minimize impacts to topography. Existing surface drainage characteristics will be modified through the removal of three individual stormwater outfalls within the creek corridor. A biofiltration gallery has been proposed at the northern end of the subject lands that will supplement low flows to the upper end of Appleby creek to replace some of the flows that will be re-directed further downstream to the Fairview Street culvert as the result of combining the existing stormwater outfalls.	Neutral
Soils	**Topsoil**	Site Preparation and Grading	Topsoil resources can be lost during site preparation through mixing with sub soils and through wind and water erosion. Due to the existing condition of the soils on the site (i.e., asphalt and fill), it is not anticipated that topsoil resources will be impacted.	Native topsoil resources should be conserved and reused where feasible. BMPs such as proper separation, stockpiling and erosion control measures, and restoration to the site following construction will be implemented.	Neutral
Air Quality	**Air**	Site Preparation and Grading	Due to the scale of the redevelopment, it is not anticipated that dust from grading and construction will result in adverse environmental impacts.	Dust control will be the responsibility of the Contractor and will be managed through construction specifications – for example, construction requirements may include the application of water to cleared and unpaved construction areas.	Neutral
Groundwater	**Groundwater Flows**	Grading, Servicing and Development	Based on the Hydrogeological Investigation (DS Consultants Ltd. 2020), ground water seepage may be encountered within the excavated area, which will require de-watering during construction. An excerpt from the Hydrogeological Investigation states: *Based on dewatering assessment, a PTTW application is required for each block. Additional monitoring may be required by the MECP to be implemented during the design stage.*	Use trench plugs or anti-seepage collars along installed services to prevent redirection of groundwater flows and water table lowering, if necessary If permanent ground water controls are required around the foundations of the buildings, a groundwater collection system will need to be implemented and flows will be directed to the creek, via the storm outfall. This will be determined at detailed design and may require a water quality treatment system prior to discharge.	Neutral
	Groundwater Quality	Grading, Servicing and Development	Site preparation activities such as grading can increase the risk of erosion and sedimentation to the NHS. Under the post-development scenario, contaminants such as oil, sand, salt and other debris may also affect the water quality of surface runoff.	Implement sediment and erosion control plans to ensure that sediments are contained on the site and do not enter the watercourses. Flows collected from the private laneways will be treated through oil/grit separators (Urbantech Consultants 2023).	Neutral
Surface Water	**Watercourse Features**	Grading, Servicing and Development	No watercourses are proposed to be removed; however, the Fairview Street crossing structure will require in-water works. South of Fairview Street, localized grading is proposed along the corridor. To optimize the corridor bottom width, mitigate future erosion and transition from the proposed structure to existing topography, armourstone retaining walls are proposed. Existing stormwater outfalls that currently outlet to	The use of retaining walls associated with the Fairview Street crossing will be minimized, to the extent possible, while addressing the design objective of a wider flood plain. To minimize impacts during construction, Section 9 of the FSR/SWM Report (Urbantech Consulting 2023) recommends best practices be implemented for all construction activities including appropriate construction phasing, staging, access	Neutral

Category	Feature/Function	Proposed Activity	Potential Impacts	Recommended Mitigation	Residual Effects
			Appleby Creek along the south side of Fairview Street via headwall structures will be integrated into the replacement structure. North of Fairview Street, localized grading and implementation of an armourstone retaining wall are proposed along the west side of the creek to mitigate future erosion and optimize the corridor bottom width, as well as the transition between the existing watercourse and the culvert inlet.	routes and erosion and sediment control (ESC) measures. All in-water or near water disturbed areas will be isolated to mitigate risk of sediment release to the creek. ESC measures will conform with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019). Additionally, detailed ESC reports and drawings will be prepared in support of the channel / culvert permit applications and subdivision road (Oval Court) and site plan submissions.	
	Watercourse Flows	Grading, Servicing and Development	Uncontrolled stormwater runoff has the potential to exacerbate erosion issues in receiving watercourses. Increases in surface water runoff entering these watercourses under post-development conditions (i.e., an increase in impervious area) could negatively impact downstream infrastructure and property. Temporary diversion of flows is anticipated during the culvert upgrade process.	Implement the SWM & ESC strategies recommended in the FSR/SWM Report (Urbantech Consulting 2023).	Neutral
	Watercourse Form and Function	Grading, Servicing and Development	The Fairview Street crossing structure will require in-water works. South of Fairview Street, localized grading is proposed along the corridor. To optimize the corridor bottom width, mitigate future erosion and transition from the proposed structure to existing topography, armourstone retaining walls are proposed. Existing stormwater outfalls that currently outlet to Appleby Creek along the south side of Fairview Street via headwall structures will be integrated into the replacement structure. North of Fairview Street, localized grading and implementation of an armourstone retaining wall are proposed along the west side of the creek to mitigate future erosion and optimize the corridor bottom width, as well as the transition between the existing watercourse and the culvert inlet. Additionally, a pedestrian bridge will be installed across the creek valley.	Implement the SWM & ESC strategies recommended in the FSR/SWM Report (Urbantech Consulting 2023).	Neutral
	Water Quality	Grading, Servicing and Development	Uncontrolled erosion, sedimentation, and machine use (including potential spills) during construction could result in release of deleterious materials (fuel, oil, lubricant, etc.) into the watercourses, and/or degradation of water quality within the limits of construction and outlying areas. Stormwater runoff could affect water quality in the receiving watercourse if released without quality control.	Implement the SWM & ESC strategies as recommended in the FSR/SWM Report (Urbantech Consulting 2023).	Neutral
	Water Temperature	Grading, Servicing and Development	Over the long-term, we don't anticipate any adverse impacts to thermal regimes in the system. It is possible that the foundation drainage collection systems will simulate baseflow and could result in a positive impact on the thermal regime.	Implement the SWM & ESC strategies as recommended in the FSR/SWM Report (Urbantech Consulting 2023) thereby resulting in improved stormwater quantity control as compared to existing conditions.	Neutral-Positive
Site Water Balance	**Overall Site**	Grading and Development	Grading activities and development of the underground parking structures may result in compaction of soils on site and will result in an increase in the overall imperviousness of the development area, thereby reducing surface water infiltration and increasing runoff which can potentially impact watercourses and other natural features.	Urbantech Consulting (2023) further details that the first 5 mm of runoff be retained on site through a combination of potential green roofs, roof top storage to enhance evaporation, irrigation, reuse opportunities, biofiltration gallery and potential passive infiltration within the buffer of Appleby Creek (to be discussed further at detailed design).	Neutral-Positive

Category	Feature/Function	Proposed Activity	Potential Impacts	Recommended Mitigation	Residual Effects
Natural Heritage System	**Trails**	Grading and Development	No trails are proposed within the RNHS including the buffer or regulatory setback.	None.	Neutral
	Pedestrian Bridge	Grading and Development	The proposed pedestrian bridge is a span design that will not require in water works in the creek or works within the valleyland. It is anticipated that the abutments will be constructed outside of top of bank and floodline and that the bridge will be installed using a crane. Similar span bridges have been approved by CH and installed across other creeks in Halton with minimal impact. Installation of the bridge may require some localized tree removal, provided these trees are not already removed as part of the erosion mitigation works. Refer to the Arborist Report (Beacon 2023) for more detail regarding removals. It is important to acknowledge that the City's Erosion EA anticipates complete vegetation/tree removal from Fairview to the railway tracks to implement their preferred alternative. The construction of the bridge abutments will require some ground disturbance and form work that could introduce sediment into the creek if ESC measures are not implemented. If glass facades are to be included in the bridge design, bird-window collisions may occur if mitigation measures are not implemented.	Beacon was consulted in determining the location and span of the proposed pedestrian bridge. While the proposed clear span pedestrian bridge will not require in-water works, the fisheries construction window will still need to be respected. As the pedestrian crossing, rehabilitation works and buffers are being designed with the common objective of enhancing the ecological and social functions of the valleylands, it is our opinion that potential impacts of the pedestrian crossing and rehabilitation works system will mitigate potential impacts and enhance the form and function of the valleylands. Implement ESC measures recommended in the FSR/SWM Report (Urbantech Consulting 2023). To ensure that sediments are contained on the site and do not enter the watercourse. Post signage and include landscape design to keep pets and people out of the valleylands. Compensate for tree removal; see section on trees below. Undertake all vegetation / tree clearing between August and March 31 so as not to impact breeding birds and not contravene the *Migratory Birds Convention Act.* The location of the proposed crossing is supported from an ecological perspective provided the above mitigation is implemented. It is recommended that an ESC Plan be prepared at the detailed design stage. Proposed mitigation measures will be reviewed at the detailed design stage. If glass facades are to be included in the bridge design, use bird safe design, in accordance with the *Bird-Friendly Building Design* standard (CSA A460), to mitigate the risk of bird collisions.	Neutral
	NHS Linkages	Grading, Servicing and Development	With the exception of the widening of the creek corridor, redevelopment on the subject lands will be confined to lands that are already fully developed. Existing connectivity functions along Appleby Creek valley will be maintained and enhanced following restoration of the valleylands. The proposed pedestrian bridge will not interfere with fish passage or wildlife movements. The span bridge will allow for vegetation cover to be established underneath as it the span will be elevated and will not cast much shade.	The proposed grading and planting within the valley, in the area of the proposed grading works, will enhance the existing urban linkage function along the reach through the widening of the creek corridor, removal of invasive species and replacement with native species. In the area of the proposed grading, the creation of a natural valley slope, as opposed to the hardened armourstone retaining wall that would otherwise be constructed based on the City's preferred alternative in the Erosion Control EA, is considered a more natural solution to the erosion and flooding along this reach.	Neutral

Category	Feature/Function	Proposed Activity	Potential Impacts	Recommended Mitigation	Residual Effects
	Trees	Grading, Servicing and Development	The tableland portion of the subject lands is generally open and is utilized for commercial and industrial purposes. Trees are scattered throughout the development and within the Appleby Creek valleylands. 340 private and public trees (tagged and in groups) are proposed for removal to accommodate the proposed development. This includes the removal of 256 individually assessed trees and all 58 trees within Tree Groups A and B, and 26 trees from Tree Group E. Of the 256 individually assessed trees for removal, 126 are private trees. On publicly owned lands, one tree (Tree 478) requires removal within the Oval Court MRA; two (2) trees (Trees 364, 365) require removal within the Fairview Street MRA for culvert works. An additional 87 public trees require removal along the eastern side of the Appleby Creek corridor to allow for the proposed floodplain grading works, biofiltration gallery outlet, and pedestrian bridge crossing. An additional 29 public trees require removal within the Appleby Creek corridor just south of Fairview Street bridge to allow for the proposed culvert replacement regrading works. Crossing details are to be further investigated at detailed design. Any additional trees identified for removal as a result of the detail design process will be replaced in accordance with City requirements. Two (2) trees would be preserved with injury and 259 private and public trees (tagged and in groups) are candidates for preservation. This includes 127 individually assessed trees and 132 trees included in Tree Groups C, D and E. Refer to the Arborist Report (Beacon 2023) for more detail regarding removals.	Trees for preservation will be protected using tree hoarding fencing in accordance with the City of Burlington's Tree Protection and Preservation Specifications (No. SS12A). Tree protection fencing alignments will be finalized at the detailed design stage. The loss of trees and associated habitat and canopy functions can be mitigated over the long term by planting replacement trees. Any trees removed under a permit issued under the City of Burlington's Private Tree By-law (02-2020) or Public Tree By-law (68-2013), will be replaced and/or compensated for as per the requirements of the applicable by-laws. A Tree Replacement/Compensation Plan will be developed in consultation with the City and Owner at the detailed design stage. As indicated throughout this report, based on the City's preferred alternative within the Erosion EA. It is anticipated that all trees within the Appleby Creek corridor north and south of Fairview Street would be/will be removed in order to implement the armourstone retaining walls along each side of the creek. The natural valley slope proposed along the eastern side of Appleby creek, as part of the proposed development, will result in opportunities for tree planting that otherwise would not exist under the City's preferred alternative.	Neutral
	Significant Woodlands	Grading, Servicing and Development	None of the treed communities associated with the Appleby Creek valleylands meet the regional criteria for Significant Woodland.	Areas of the valleylands affected by grading will be revegetated as per CH Guidelines.	Neutral-Positive
	Wetlands	Grading, Servicing and Development	There are no significant wetlands associated with the site. However, there is a small wetland community located in the Appleby Creek valleylands that is much smaller than 2 ha (it is approximately 0.01 ha) and is located approximately 15 m west of the subject lands. This wetland will not be affected by the re-development proposal but will likely be affected by future erosion control works proposed by the City.	Implement the SWM & ESC strategies as recommended in the FSR/SWM Report (Urbantech Consulting 2023). It is recommended that the City's future engineered channel design for the creek corridor integrate pocket wetlands to maintain this type of habitat.	Neutral
	Valleylands/Hazard Lands	Grading, Servicing and Development	As explained in Section 4.3.5, the Appleby Creek valleylands do not meet the criteria of a Significant Valleyland. Grading is occurring on the eastern portion of the Appleby Creek valleyland to adjust the floodplain. The existing Fairview culverts will be reconstructed to contain the floodplain within the creek corridor, eliminate spill over Fairview Street and provide flood free access to the	Negative impacts to the valleylands are proposed to be mitigated or removed by implementing the following measures: • Avoid in water works as feasible; • Minimizing the use of retaining wall associated with the Fairview Street crossing, to the extent possible, while addressing the design objective of a wider flood plain;	Neutral-Positive

Category	Feature/Function	Proposed Activity	Potential Impacts	Recommended Mitigation	Residual Effects
			proposed development, existing development, and the City Park.	• Implement ESC measures as per recommendations of the FSR (Urbantech 2023); • Along a portion of the eastern valley slope, establish a new stable slope and revegetate with appropriate native species; • Limit development to areas outside of the 7.5 m setback to the greater of the proposed stable top of slope or proposed floodplain with the exception of the underground parking which will encroach to within 2m of the flood plain limits along a portion of the northern property boundary. Since the parking structure will be below grade, there will be no negative impact to the extent of the flood plain limits during or post-construction; • Establish fencing at limits of developments to reduce human disturbances and encroachments; and • Naturalize the buffer/setback area between the development and the valleyland.	
	Significant Wildlife Habitat	Grading, Servicing and Development	The SWH screening identified the Appleby Creek as potential candidate SWH for Black-crowned Night-Heron (BCNH), a provincially rare bird. The proposed works in the valleyland will replace much of the existing invasive vegetation with native vegetation which will improve habitat conditions for BCNH. Furthermore, the Appleby Creek Erosion EA has recommended that future creek design include pools and cattail marsh habitat for the purposes benefiting BCNH.	Implement restoration of the valleylands to provide a wider valleyland that can be restored with native vegetation cover. Prior to work taking place in the Appleby Creek corridor, the absence of nesting birds will be confirmed by a qualified avian biologist.	Neutral-Positive
	Fish and Fish Habitat	Grading, Servicing and Development, SWM Facility and Storm Outfall	Appleby Creek supports both coolwater and warmwater fish species. No negative impacts to fish habitat are anticipated. The redevelopment will introduce protection measures such as buffers, SWM and BMP measures that presently do not exist. The proposed development is not anticipated to interfere with groundwater flows. Groundwater levels are below the creek elevation and the creek contributes to recharge.	Implement ESC measures recommended in the FSR/SWM Report (Urbantech Consulting 2023). To ensure that sediments are contained on the site and do not enter the watercourse. It is recommended that an ESC Plan be prepared at the detailed design stage. Additionally, detailed ESC reports and drawings will be prepared in support of the channel / culvert permit applications and subdivision road (Oval Court) and site plan submissions. Implement stormwater design to meet water quality and water quantity objectives. The stormwater system will be designed to improve the quality of runoff. In addition to the traditional stormwater management system that will direct all storm flows to a single outlet at Fairview Street, a clean water system will also collect runoff from a greenspace at the north end of the property and outlet to the upstream reach of the creek. Following the proposed works outlined in the erosion EA, the proposed redevelopment will result in a widened valley	Neutral-Positive

Category	Feature/Function	Proposed Activity	Potential Impacts	Recommended Mitigation	Residual Effects
				corridor and enhanced/increased setback between the watercourse (fish habitat) and the adjacent development to the east. Submit a request for project review to DFO prior to construction. Secure necessary permits from CH prior to construction.	
Wildlife	**Birds**	Grading, Servicing and Development	Based on the available information, no significant changes to the composition of the avian community is anticipated. The avian community that is present is adapted to noise, light and activities associated with the current industrial, rail and transit station. Other than the proposed pedestrian bridge all future human activities will occur further from the valley than under current conditions. The species that comprise the community are not highly sensitive, so the composition of the community is not expected to change because of the change in human uses in the area. Over the longer term, following restoration and enhancement of the valleylands, it is anticipated that habitat conditions for birds will be improved. The proposed redevelopment could result in increased potential for bird strikes.	Undertake all vegetation / tree clearing between August and early April so as not to impact breeding birds and not contravene the *Migratory Birds Convention Act.* Establish fencing (without gates) at rear of lots to reduce human disturbances and encroachments. Implement Bird Friendly measures in building design and lighting at the detailed design stage.	Neutral
	Amphibians	Grading, Servicing and Development	There is no suitable amphibian breeding habitat on the subject lands.	No mitigation required.	Neutral
Species at Risk (SAR)	**SAR Habitat**	Grading, Servicing and Development	The ecological surveys and habitat assessments indicate that the study area does not support habitat for endangered or threatened species. While endangered species such as Little Brown Myotis were detected in Cultural Woodland and Cultural Thicket (ELC Units 1 and 2a, respectively), the low number of calls are not consistent with roosting habitat.	MECP will be consulted re. habitat for SAR bats by submitting an Information Gathering Form and the Region and City will be copied on these correspondences. Any mitigation requirements identified by MECP will be included in design and construction drawings and implemented.	Neutral

8. Monitoring

To ensure the effectiveness of mitigation measures recommended in the EER/EIA, it will be necessary to implement some basic environmental monitoring. It is recommended that the monitoring program focus on mitigation measures such as erosion and sediment controls, buffer integrity and landscaping.

Monitoring will be completed prior to development to document the existing site conditions, during development to ensure that appropriate protection measures are implemented and performing as designed and following development to assess long term performance.

The proposed environmental monitoring program is presented in **Table 11**. The proposed monitoring program will be subject to input and approval by the City and Conservation Halton.

Table 11. Proposed Monitoring Framework

Ecosystem Component	Objective(s) / Rationale	Monitoring Parameter(s)	Monitoring Indicator(s)	Methods	Frequency & Duration			Responsible Personnel
					Pre-Development	During Construction	Post-Development	
Surface Water Resources	To monitor changes in biotic indices over time as a surrogate measure of water quality	Quality	Benthics	Take samples from Appleby Creek upstream and downstream of the SWM. Determine Biotic Indices.	Once to establish baseline conditions	Annually until 85% Buildout	Annually following 85% Buildout for a maximum of 3 years.	Beacon
	To monitor changes in water temperature over time.	Quality	Temperature	Install Temperature Loggers in creek upstream and downstream of property. Also install air temp logger. Record hourly between March and October	Once to establish baseline conditions	Annually until 85% Buildout	Annually following 85% Buildout for a maximum of 3 years.	Beacon
	To monitor condition and performance of ESC measures	Sediment	ESC Measures (silt fence, SWM, OGS, etc.)	Inspect ESC measures visually.	N/A	Weekly during construction or after rain events greater than 20 mm	Monthly until site and SWM are vegetated and stabilized.	Beacon
Terrestrial Resources	To monitor the site for potential encroachment activities.	Buffer Integrity	Human related disturbance	The interface between the development and natural heritage system will be surveyed to document evidence of human disturbance. Observations will be photo catalogued and categorized according to disturbance type, extent and magnitude of effect.	Once to establish baseline condition	Annually until 85% Buildout	Annually following 85% Buildout for a maximum of 3 years.	Beacon

Ecosystem Component	Objective(s) / Rationale	Monitoring Parameter(s)	Monitoring Indicator(s)	Methods	Frequency & Duration			Responsible Personnel
					Pre-Development	During Construction	Post-Development	
	To monitor the condition and performance of the buffer/enhancement plantings	Buffer Integrity	Condition of buffer and valleyland plantings	Buffers and areas of disturbed valleyland will be planted and naturalized using native species. The condition of these plantings will be assessed using standard vegetation plots.	None	Annually until 85% Buildout	Annually following 85% Buildout for a maximum of 3 years.	Beacon

9. Policy Conformity

The following table (**Table 12**) presents an assessment of the proposal's compliance with applicable Acts and policies.

Table 12. Policy Compliance Assessment

Applicable Policy / Legislation	Relevant Study Findings And Recommendations	Compliance
Federal *Fisheries Act* (1985)	The Appleby Creek supports direct fish habitat. All direct fish habitat will be protected. Potential indirect impacts to fish habitat will be mitigated by implementing a range of measures, including, but not limited to: • A Request for Project Review will be submitted to DFO prior to any in-water works; • Removal of existing partial barriers to fish passage; • Enhanced level treatment through stormwater management; • ESC protection during construction; • LIDs to sustain maintain surface flows to upstream limit of the creek; • Buffer naturalization; and • Removal of waste and debris from channel.	Yes
***Endangered Species Act* (2007)**	Habitat of Endangered and Threatened species is not considered to be present on or adjacent to the study area. While endangered bats were detected, there are no confirmed maternity roosts are present in the area. MECP will be consulted to confirm the presence/absence of regulated habitat prior to development and site alteration and the Region and City will be circulated on related correspondences.	Yes
Provincial Policy Statement (2020) Section 2.1 – Natural Heritage	Fish habitat is confirmed in the study area. See text above re: *Federal Fisheries Act*. Potential Candidate Significant Wildlife Habitat for Black-crowned Night Heron was identified in the Appleby Creek valleyland and measures are proposed enhance its habitat.	Yes
Provincial Policy Statement (2020) Section 2.2 – Water	The proposed development includes improvements to water quality through implementation of LIDs and enhanced SWM as compared to existing conditions where there are no SWM controls as well as improvements to Appleby Creek.	Yes
Provincial Policy Statement (2020) Section 2.3 – Natural Hazards	The FSR has demonstrated that the grading to occur within valley will remove existing development, including Fairview Street, from the Regional Storm floodplain and will provide flood free access/egress to both the proposed development as well as existing development on the east side of the creek and as such, is consistent with PPS policy.	Yes

Applicable Policy / Legislation	Relevant Study Findings And Recommendations	Compliance
Halton Region Official Plan (2018) – Regional Natural Heritage System	The EER/EIA has identified the limits of the Regional Natural Heritage System, which includes the following components: • Key Features (i.e., fish habitat); • Enhancements to key features (include enhancement measures within the valleyland); • Buffers; • Watercourses that are within a Conservation Authority Regulation Limit (Appleby Creek); • Wetlands other than those considered significant under Section 115.3(1)(b) (ELC Unit 4 – Cattail Mineral Shallow Marsh); • Significant Wildlife Habitat for Rare Species (potential candidate for BCNH); and • Regional Storm floodplain Mitigation measures outlined in the EER/EIA ensure that potential negative impacts are avoided or mitigated. There will be no negative impacts to Key Features of the Regional Natural Heritage System and the RNHS will be expanded in relation to its current configuration through the widening of the valley and addition of buffer on the east side of the valley resulting in positive impacts to the RNHS.	Yes
Halton Region Official Plan (2018) – Environmental Quality	The EER/EIA has demonstrated that the valleyland enhancement proposed as part of the proposed development will result in a net benefit to fish within Appleby Creek. Furthermore, existing trees will be integrated into the proposed development to the extent feasible. Tree losses will be offset through streetscaping and plantings associated with LIDs, trails and ecological and landscape buffers, resulting in an overall increase to the Urban Forest canopy and species diversity on the subject lands and in the study area.	Yes
Halton Region Official Plan (2018) Stormwater Outfall in RNHS	There are three existing stormwater outfalls along the eastern valley slopes that service the existing development as well as one outfall south of Fairview Street that services most of Oval Court and some additional lands east of the creek. There is also an existing stormwater outfall on the west side of the creek, at Fairview Street, that services the lands to the west. All these existing stormwater outfalls will be decommissioned and replaced by three outlets: (1) a single outlet that will be constructed on the east side of the proposed upgraded Fairview Street crossing to replace the four existing outfalls on the east side of the creek; (2) a single outlet on the west side of the Fairview Street crossing to replace the existing outlet that will need to be removed to install the upgraded crossing; and, (3) an outlet at the northern	Yes

Applicable Policy / Legislation	Relevant Study Findings And Recommendations	Compliance
	limit of the reach, just south of the rail line, for the proposed biofiltration facility. The two outlets proposed at Fairview Street are replacements of existing outfalls and tie into existing infrastructure within Fairview Street. As such, there is no ability to relocate these outlets and their construction within the NHS is unavoidable. In addition, the eastern outlet will serve to eliminate three existing outfalls within the creek, north of Fairview Street, thereby providing a benefit to the NHS. As per ROP policies 117.1, essential transportation and utility facilities are a permitted use within the NHS. Storm water systems, including outfalls, are considered utility facilities as per ROP Policy 288, and essential is considered necessary and in the public interest after all alternatives are considered, as per ROP Policy 233. The proposed outfalls at the Fairview Street crossing are considered essential as they are it is in the public interest to manage stormwater and address flood hazards and there are no alternatives for discharging stormwater to other locations. In addition, the proposed outlet at the northern limit of this reach, for the biofiltration facility, is considered essential as it has been proposed in order to supplement the creek flows through the Study Area in recognition of the removal of the three existing outfalls between the railway line and Fairview Street.	
City of Burlington Official Plan (2019 consolidation) – Natural Heritage	This EER/EIA has demonstrated that there will be no negative impacts to the ecological form or functions of fish habitat within and adjacent to the subject lands. The proposed buffer plantings and SWM plan result in a net improvement to fish habitat in Appleby Creek. Furthermore, the proposed development has been directed away from hazard lands. The location of the proposed pedestrian crossing of Appleby Creek will need to be reviewed by the City of Burlington and Conservation Halton. See “Conservation Halton Regulation”, below. Compliance with s.6.4 requires that works near Appleby Creek be reviewed by the City of Burlington and CH.	In process – review of proposed pedestrian bridge and SWM plan by the City of Burlington and CH will occur following redevelopment proposal submission
City of Burlington Official Plan (2019 consolidation) – Environmental Evaluation	This EER/EIA includes all the requirements of an Environmental Evaluation, including the identification of buffers and setbacks, as well as the requirements of the Region’s EIA.	Yes
City of Burlington Official Plan (2019 consolidation) – Sustainable Design and Compatibility	The EER/EIA has demonstrated that the proposed redevelopment is compatible with existing significant natural features (i.e., fish habitat) utilizes LID measures to the extent feasible and provides opportunities for active transportation.	Yes

Applicable Policy / Legislation	Relevant Study Findings And Recommendations	Compliance
City of Burlington Official Plan (2019 consolidation) – Stormwater Management	The SWM Plan (Urbantech Consulting 2023) includes a suite of SWM approaches, including multiple types of LIDs as well as traditional end-of-pipe SWM. The SWM Plan has demonstrated that flooding and erosion has been managed to avoid risk to life and property as well as to maintain and enhance fish habitat.	Yes
Conservation Halton Regulation (Ontario Reg. 162/06)	The subject lands include a watercourse, wetlands, and hazard lands (i.e., floodplains and valley feature), all subject to CH regulation. The EER/EIA has confirmed all features that would be subject to CH regulation, and the proposed development will alter the floodplain and valleyland in order to contain the Regional Storm floodplain and remove it from the tablelands and Fairview Street. A 7.5 m vegetated buffer will be applied from the greatest hazard following the proposed valleyland grading. CH policy permits floodplain alterations where such alterations have been contemplated through an EA. The city's Erosion EA included the potential for creek widening in this location as part of a future development application. Some elements of the development, such as a proposed pedestrian crossing Appleby Creek, valleyland grading SWM outfalls and a portion of the underground parking will require permits from Conservation Halton. Appropriate mitigation measures have been identified and will need to be implemented to mitigate potential impacts to the regulated features.	Yes – agency consultation occurred.

10. Natural Heritage Management Recommendations

Table 13 below provides a summary of key design and mitigation measures that are proposed to be implemented at various project stages to protect, maintain, restore and enhance the RNHS where applicable. As many of the recommended mitigation measures are directly or indirectly related to implementation of environmental management systems such as stormwater management, erosion and flood mitigation, construction management, the source technical studies (e.g., FSR) should be consulted for additional details.

Table 13. Recommendations Related to Mitigating Impacts to RNHS

Project Stage(s)	Recommendation
All	• Implement monitoring of various biophysical parameters as per Table 10.
Detailed Design	• Complete detailed design for valleyland works, pedestrian crossing, and Fairview Street crossing in coordination with the City's EA project design. • Complete detailed design of pedestrian span bridge that minimizes ecological footprint. If glass facades are proposed on the pedestrian bridge, mitigation for bird strikes should be incorporated. • Complete detailed design for biofiltration swale at the northern end of the subject lands to provide clean water inputs to the upper reach of Appleby Creek to mitigate loss of inputs resulting from combining the existing outfalls. • Complete detailed landscaping plans for the development site and prioritize use of locally native species and, where possible, exclusively. No invasive or aggressively spreading non-native species shall be utilized to landscape the site. • Complete detailed landscaping plans for the valleyland setback in accordance with CH Guidelines. These plans should focus on provision of buffer functions including fencing and signage to discourage pets and people from entering the NHS. • Complete valleyland restoration plans in accordance with CH Guidelines. These plans should focus on restoring and enhancing fish and wildlife habitat and promoting biodiversity. • Complete detailed ESC plans. • Building designs to incorporate measures to mitigate bird strikes. • Light plans to minimize light pollution.
Permitting	• Undertake a DFO Self-Assessment and Request for Project Review • Consult with MECP re. habitats of endangered species prior to development and site alteration and copy Region and City on related correspondences • Obtain CH permits for proposed works in regulated areas.

Construction	• Respect applicable construction timing windows for fish and wildlife
	  ○ For in-water works, the timing window is from June 15th – March 31st.
	  ○ For vegetation removals, the timing window is between August and early April.
	  ○ For tree clearing, subject to confirmation from MECP that endangered bat habitat is present within the subject property, the timing window is from November 16 to March 14.
	  ○ Timing windows are to be confirmed with appropriate agencies prior to initiation of construction
	• Implement ESC Plans
	• Implement Tree Protection Plans
	• Implement Construction Management Plan.
	• Implement Groundwater Management Plans (i.e. dewatering, etc.)
	• Undertake the proposed valleyland and crossing works to mitigate erosion and flooding.

11. Conclusion

This EER/EIA has been prepared in support of a site-specific development application for the subject lands on behalf of the Branthaven Development Corp. in support of a redevelopment proposal for properties located at 720, 735 and 740 Oval Court and 5135 and 5155 Fairview Street in the City of Burlington. This report has been prepared in accordance with the Terms of Reference approved by the City, Region and Conservation Halton.

The information presented in this report is comprehensive and based on available background studies, site-specific field assessments and analyses completed to date. It integrates the findings of companion technical studies prepared by members of the multi-disciplinary EER/EIA Study Team and is intended to be read in conjunction with the FSR/SWM (Urbantech Consulting 2023) and other technical studies.

In summary, this EER/EIA has:

- Provided a comprehensive summary of federal, provincial, regional, conservation authority and municipal environmental regulations and policies that govern land use planning and development within the study area;
- Updated the existing knowledge base of biophysical resources and ecological functions within the study area by consolidating available background information and supplementing it with more detailed information and analyses from site-specific technical studies;
- Identified the relative significance and sensitivities of natural heritage features and areas within the study area according to applicable policies and regulations;
- Identified biophysical constraints to development based on consideration of physical constraints (utilities/infrastructure), natural heritage constraints (i.e., Regional Natural Heritage System), and natural hazard constraints (i.e., flooding and erosion);
- Identified opportunities for enhancement of Key Features of the Regional Natural Heritage System;
- Recommended limits of development for use in developing the proposed site plan;
- Described the proposed Site Plan;
- Described all components of the proposed development (grading, servicing, stormwater, trails, etc.);
- Assessed and evaluated the potential impacts of these changes on the refined Regional Natural Heritage System;
- Recommended measures for avoiding and/or mitigating potential impacts;
- Included a proposed Monitoring Framework for agency review; and
- Assessed compliance of the proposed development with applicable environmental legislation, policies and regulations.

Both the EER/EIA and the proposed Site Plan were developed with input from the EER/EIA Study Team. One of the principal design objectives for the Site Plan was to achieve environmental protection and to integrate the development into the surrounding landscape in a manner that enhanced the condition and function of the valleyland. Such an approach was necessary to satisfy the various regulatory requirements for protection of fish habitat and the Region's NHS policies. Additionally, to satisfy the various environmental protection requirements, it was necessary for the ultimate proposed development design to be limited to those lands that are part of the formerly developed lands and situated outside the boundaries of the refined Regional Natural Heritage System.

The only permanent components of the proposed redevelopment that will overlap with the Regional Natural Heritage System are the replacement of the Fairview Street crossing and storm outfall, the proposed pedestrian bridge crossing and an outlet from the proposed biofiltration gallery at the northern limit of the subject lands. Although not part of the Regional Natural Heritage System, a small portion of the underground parking structure is proposed within Conservation Halton's 7.5 m regulatory allowance adjacent to the Regional Storm flood plain. Given that the structure is underground, no impacts to the floodplain, during or post construction, are anticipated.

As discussed in **Section 7** of this report, the biofiltration gallery is proposed for water balancing purposes and to supplement flows in the creek which will have a positive effect. Additionally, the buffer to the Appleby Creek valley will allow for maintenance of surface drainage from these areas to the creek and will be an improvement over current conditions given that existing development/paved parking areas extend to the top of bank. Furthermore, we note that the developable area of the subject lands relative to the upstream drainage area of the creek is minimal and as such, the small area of uncontrolled runoff from the site directed to the creek will have minimal impact on the system. However, the proposed SWM will result in an overall improvement to the stormwater flows leaving the site given that there are currently no quantity or quality controls in place. Therefore, we do not anticipate negative impacts to Appleby Creek.

By limiting the redevelopment to areas outside the Regional Natural Heritage System (with the exception of the valleyland grading that will encroach into, and expand, the Regional Natural Heritage System and the new Fairview Street culvert, biofiltration gallery and pedestrian crossing), direct impacts have been largely avoided. Notwithstanding, flood mitigation works along Appleby Creek will have a temporary short-term impact. The impact assessment presented in the EER/EIA is focused primarily on mitigating potential indirect impacts and reduced levels of risk. The impact assessment considered the effects of site preparation activities (clearing, grading), construction (servicing, roads, buildings), and post-construction activities on physical and biological resources of the property and surrounding natural area. Based on the development form and the provision of enhanced open space, negative impacts to terrestrial and aquatic habitat are not anticipated. As is demonstrated through the impact assessment matrix in **Table 10**, the proposed development will have a net ecological benefit relative to the existing land use. This is because the proposed development implements environmental protection measures such as buffers and setbacks to natural features (i.e., valleylands, watercourse, fish habitat) and environmental management systems (i.e., SWM, LIDs) that serve to improve the quality of water discharging to the valley and creek system. Additionally, it is proposed that the valleyland buffer be naturalized using locally appropriate native species.

The Regional Natural Heritage System encompasses all sensitive and significant natural heritage resources associated with the subject lands. Additionally, a buffer has been added to the RNHS (as one does not currently exist). This buffer is proposed to be planted with native species which will result in improvements to the ecological form and function of Appleby Creek and habitat improvements for fish.

In conclusion, it is the opinion of Beacon that:

- The proposed redevelopment will not negatively affect the refined Regional Natural Heritage System provided that the recommended mitigation measures specified in this report (and in the companion technical studies) are appropriately implemented; and
- The proposed redevelopment is in compliance with applicable legislation, regulations and policies.

Monitoring recommendations were made based on the field and impact assessments and include observations of the storm outlet to evaluate performance and monitor for evidence of erosion from the introduction of flows to the floodplain. Monitoring requirements will be reviewed and refined, as appropriate, during the detailed design phase based on agency input.

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Appendix A

Environmental Impact Assessment Terms of Reference and Agency Correspondence

April 13, 2021 BEL 218416

Brynn Nheiley
Manager of Development Planning
Department of Community Planning
City of Burlington
426 Brant Street
Burlington, ON L7R 3Z6

Re: Red-Lined Final Terms of Reference for Scoped Environmental Evaluation Report / Environmental Impact Assessment in Support of Redevelopment of 720, 735 & 740 Oval Court and 5135 and 5155 Fairview Street, City of Burlington, Ontario

Dear Ms. Nheiley:

Beacon Environmental Limited (Beacon) has been preparing a Scoped Environmental Evaluation Report / Environmental Impact Assessment (EER/EIA) in support of redevelopment of 720, 735 & 740 Oval Court and 5135 and 5155 Fairview Street, City of Burlington, Ontario (as shown in **Attachment A**).

Draft Terms of Reference (TOR) for this EER/EIA were previously submitted on June 3, 2019, and comments on that submission were received from Conservation Halton (CH) and Region of Halton staff on October 16, 2019 and October 17, 2019, respectively. These comments were taken into consideration and Revised TOR were resubmitted on October 21, 2019. Regional staff provided additional comments for the Revised TOR on November 13, 2019. The October 2020 TOR were submitted, then within the updated pre-consultation notes dated March 29, 2021, the Region provided a comment stating that these TOR are revisited to ensure the extent of the required study is still appropriate. Beacon is of the opinion that this most recent TOR (April 2021) is still applicable to the current proposed development (Drawing A-101, Core Architects 2021). Additionally, within the updated pre-consultation notes, CH asked that the TOR be updated to reflect the proposed pedestrian crossing. These comments are included in **Attachment B**.

Conservation Halton (CH) also provided their input for the Revised TOR (October 21, 2019) on December 18, 2019, which included a single comment regarding the recommended a 30 m fisheries setback be applied to Appleby Creek, but had otherwise signed off on the TOR. In response to this comment, Jennifer Lawrence and Associates and Beacon prepared a memorandum dated January 28, 2020 explaining why a 30 m fisheries setback was not warranted in this situation. In response to the memorandum, CH confirmed in their correspondence of March 27, 2020 that the appropriate setback would be determined though the EER/EIA. This correspondence and letter have been included in this TOR as **Attachment C**.

This Final TOR addresses the outstanding comments from the pre-consultation notes dated March 29, 2021 (these modifications are coloured red), no other changes to the TOR have been made.

We trust that the enclosed Final TOR are acceptable to all parties. Should you or the circulated agencies have any questions, please do not hesitate to contact the undersigned at (519) 835-6455.

Prepared by:
Beacon Environmental



Ken Ursic, B.Sc., M.Sc.
Principal, Senior Ecologist

cc. Thomas Kastelic – Branthaven Development Corp.
Emma DeFields – Conservation Halton
Adam Huycke – Region of Halton
Jennifer Lawrence – Jennifer Lawrence and Associates

BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Red-lined Final Terms of Reference for Scoped Environmental Evaluation Report / Environmental Impact Assessment in Support of Redevelopment of 720, 735 & 740 Oval Court and 5135 and 5155 Fairview Street, City of Burlington, Ontario

Prepared For:

Branthaven Development Corp.

Prepared By:

Beacon Environmental Limited

Date:	*Project:*
April 13, 2021	**218416**

Final Terms of Reference for EER/EIA

On behalf of Branthaven Development Corp. (Branthaven), Beacon Environmental Limited (Beacon) has prepared the following Final TOR for a Scoped EER/EIA in support of the redevelopment of properties located at 720, 735 and 740 Oval Court and 5135 and 5155 Fairview Street in the City of Burlington, herein referred to as the subject lands (**Attachment A**). The subject lands are 4.59 hectares and are comprised of existing development situated immediately east of the Appleby GO Station and Appleby Creek, and west of Sherwood Park. The proponent intends to redevelop the subject lands into a transit-oriented community designed for residential, retail and commercial uses subject to obtaining the necessary planning approvals for such a community.

Within the City of Burlington's new Official Plan (April 2018), the subject lands were identified as part of a future Mobility Hub that will be comprised of Mixed-Use Nodes and Intensification Corridors. At the time of writing this TOR, the City of Burlington has put the Mobility Hub studies on hold while they re-examine the adopted Official Plan. This re-examination of their Official Plan has almost concluded and the Mobility Hub work is planned to start again in 2021.

The Region indicated in their comments dated November 13, 2019 that if the comprehensive studies for the Mobility Hub were not completed in advance of this site plan application, that it was their expectation that the Oval Court EER/EIA would include a comprehensive analysis of the Mobility Hub Study Area to ensure the City's goals and objectives are met. As noted above, at the time of writing this TOR, the Mobility Hub project is on hold, however, certain studies within the Mobility Hub study area have already been completed that provide insight into existing conditions. This includes the Appleby Creek Flood and Erosion EA studies, completed by the City of Burlington, which identifies existing areas of flooding and erosion concerns along with recommended mitigation measures. This EER/EIA will integrate the findings of these studies and will consider the natural heritage opportunities and constraints of the broader Mobility Hub Study Area based on a desktop analysis of existing natural heritage and natural hazard data. This desktop analysis is scoped to that portion of the Appleby Creek within the Mobility Hub study area given that any direct or indirect impacts associated with the proposed development would be limited to the Appleby Creek watershed and would not have any impacts on the Sheldon Creek watershed which is also within the Mobility Hub study area.

The subject property is identified as part of the future Appleby GO Central Precinct and Fairview Frequent Transit Corridor Precinct. These precincts have been identified for a mix of future high rise and mid-rise residential, retail and commercial uses. Additionally, the precinct plan identifies a potential active transportation corridor (i.e., pedestrian bridge) crossing of Appleby Creek between the subject lands and the Appleby GO Station.

The study area for the EER/EIA will extend from the subject lands to the railway corridor to the north, 10 m into Sherwood Park to the east, to Fairview Street along the southern boundary and will include the valleylands of Appleby Creek to the west (shown on **Attachment A**). As the subject lands are situated adjacent to the Appleby Creek valleylands (which are identified as part of the City's NHS as identified on Schedule M), the proposed redevelopment is subject to policy 2.5 and requires that an EER/EIA be prepared to assess the potential impacts of a re-development proposal on Key Natural Features of the NHS. Additionally, these valleylands are regulated by Conservation Halton (CH) and any development or site alterations proposed within or adjacent to it is subject to Conservation Halton (CH) policies and permitting requirements.

As per City policy 2.5e, the EER/EIA will be completed in accordance with the 2015 Region of Halton EIA guidelines. The Regional EIA guidelines are very comprehensive and require addressing potential impacts on a broad range of natural heritage features and functions, many of which are not associated with the subject lands. Given that the subject lands are located in an urbanized setting, it is proposed that the EER/EIA requirements be scoped. Policy 2.5 g allows for scoping through consultation with the agencies. During our site visit on October 19, 2018, we confirmed with CH staff that the EER/EIA could be scoped, and planning staff indicated they would review the Terms of Reference and provide guidance on the extent of scoping they can support. In keeping with the Region's EIA Guidelines (2015), the EER/EIA will include:

- A description of the key features and their adjacent lands in the study area;
- A discussion of the diversity and connectivity of key features with recommendations for how these features and their functions may be improved;
- The study area will be extended to 120 m from key features when considering possible impacts as a result of the development;
- An assessment of the proposed development against the federal Species at Risk Act, where necessary;
- Studies to determine the presence of Significant Wildlife Habitat;
- Inclusion of direct, indirect and cumulative impacts of the proposed development on the ecological form and function of the Natural Heritage System and adjacent lands within the Impact and Mitigation section of the EER/EIA;
- An evaluation of proposed development against all relevant policy and regulations; and
- A discussion of the possible effects of increased impervious area and related stormwater issues.

Background Review

Beacon will obtain and review all background information relevant to natural heritage resources in the study area to identify any natural areas (i.e. ANSI's, etc.) that are designated by Conservation Halton or other agencies. These resources include:

- Region of Halton Official Plan;
- City of Burlington Official Plan;
- Natural Heritage Information Centre;
- Ministry of the Environment, Conservation and Parks (MECP) – Client's *Guide to Preliminary Screening for Species at Risk* (May 2019);
- Consultation with the MECP regarding a Species at Risk (SAR) screening for the property, which will be appended to the report;
- Physiography of Southern Ontario (Chapman and Putnam 1984);
- Halton Natural Areas Inventory;
- Data request to Conservation Halton for data from long-term monitoring in the study area;
- Bird Studies Canada;
- Herpetological Atlas;
- Ontario Butterfly Atlas; and
- Ontario Mammal Atlas.

We understand that the City recently completed an environmental assessment (EA) for flood mitigation in Appleby Creek and is currently completing an erosion EA (Draft released September 25, 2019). Additionally, we understand that Dillon Consulting is completing a Scoped Environmental Impact Study for the City of Burlington for the lands located with the Appleby Mobility Hub. We will review the information from these studies and integrate within the EER/EIA where appropriate.

Policy Framework

Beacon will review and outline all federal, provincial, municipal and agency policies and regulations relevant to the study area and the proposed development. Additionally, Beacon will assess the proposed development against these relevant legislation and policies. The following resources will be reviewed for this purpose:

- Provincial Policy Statement (2020);
- Halton Region Official Plan (2018);
- City of Burlington Official Plan – Office Consolidation 2017;
- New City of Burlington Official Plan – Official Plan Adopted by Burlington City Council (November 2020);
- City of Burlington Flood and Erosion Mitigation EAs;
- Conservation Halton Policies and Regulation;
- *Endangered Species Act* (2007);
- Federal *Fisheries Act*; and
- *Migratory Birds Act*.

Characterization of the Biophysical Environment

To characterize the biophysical features and functions associated with the study area, we propose to complete the following ecological surveys:

- Leaf Off Assessment of trees in the valleyland to determine potential for bat roosting sites;
- Tree Inventory & Plan for subject lands and adjacent valleylands;
- Breeding amphibian surveys in accordance with Marsh Monitoring Program starting in early spring (three surveys) with the addition of walking Appleby Creek and listening for calling amphibians outside the prescribed three-minute window;
- Breeding bird surveys in accordance with Ontario Breeding Bird Atlas between late May and July 5th (two surveys);
- Reptile surveys (incidental by flipping cover objects and surveying for basking turtles);
- Acoustic monitoring for bats;
- Aquatic Habitat Assessment of Appleby Creek;
- Ecological Land Classification; and
- Floristic survey to screen for rare plants.

Incidental observations of wildlife will be noted and discussed in the EER/EIA.

The dripline, as staked by the Regional Forester on October 19, 2018, will be included in the characterization of the study area and will be shown on all figures.

The findings from other relevant technical studies that have been or are being completed by other consultants on the project team will be discussed and integrated with the EER/EIA.

Any correspondence relating to the consultation with MECP regarding the *Endangered Species Act* will be appended to the EER/EIA.

Evaluation of Significance and Sensitivities

Beacon will review the ecological data collected through the characterization work to determine the significance and sensitivity of the natural heritage resources in the study area. A significant woodland assessment in accordance to Section 277 of the Regional Official Plan will be conducted. Beacon will provide a description of the natural heritage features of the study area, including the valleylands and any potential significant wildlife habitat, fish habitat, habitat of SAR and wildlife connectivity.

The EER/EIA will provide a summary of the resulting significant natural heritage resources and areas. The significance of features will be evaluated using provincial and municipal criteria for the various natural heritage elements outlined in the provincial policy, regional and local official plans. We will rely upon current species status lists to determine the significance of species observed. This will be used to confirm the presence of and extent of any Key Natural Features.

Constraints and Opportunities

A constraint and opportunities analysis will be undertaken to identify constraints to development as well as opportunities to enhance the NHS. The constraint analysis will summarize the levels of protection required for the various Key Natural Features, including recommended buffers. Additionally, the EER/EIA will summarize natural hazard related constraints using information from the geotechnical consultant and others. The natural heritage and natural hazard constraints, including setbacks, will be used to establish development limits and guide the development design. Mapping included in the report will map staked boundaries and present the appropriate buffers and setbacks to the NHS adjacent to the subject lands over recent aerial mapping.

The EER/EIA will also identify opportunities for enhancements to Key Natural Features of the NHS within the study area where feasible. Opportunities to be considered will include water quality improvements, erosion mitigation, and low impact development (LID). The EER/EIA will include recommendations, where feasible, for all restoration and enhancement opportunities to maximize buffering capacity of the proposed buffer area.

Description of the Development Proposal

The EER/EIA will include a description of the proposed development including a summary of the following:

- Statement of purpose/rationale for development;
- Draft Plan;
- Grading & Servicing Plans;
- Stormwater Management Plan;
- A description of development related activities; and
- Development Schedule / Timeline.

Impact Assessment and Mitigation

This EER/EIA will include an assessment of potential development related impacts to Key Natural Features of the NHS. Potential direct and indirect impacts associated with the proposed development will be assessed for various development related activities and their effect on natural heritage resources, hydrogeology, hydrology, and geomorphology. The direct and indirect impacts related to site preparation and development will be also be assessed and described in terms of their short and long-term effects on the biophysical environment.

The impact assessment will include recommendations for a range of mitigation measures that can be used to avoid or reduce development related impacts to Key Natural Features of the NHS. Measures to be considered include buffers and setbacks, timing restrictions, stormwater management, sediment control, and infiltration management. Additionally, opportunities for enhancements to key natural heritage features will be recommended. CH's "Landscaping and Tree Preservation Guidelines" and "Erosion and Sediment Control Guideline for Urban Construction" will be consulted as part of this process.

The net or residual effects of the proposed development activities on the various components of the NHS will be determined as either negative, neutral or positive once mitigation measures are applied. Rationale for the assessment will be provided and the EER/EIA will demonstrate that the proposed development will result in no negative impacts to natural features comprising the NHS.

It should be noted that Branthaven and their consultant team are presently working with the City and CH on a solution to address flooding in the area. There is a possibility that the solution may require alterations to portions of the valleylands (i.e. creek re-alignment, floodplain modification). The impact assessment will also address impacts associated with these activities.

Additionally, the EER/EIA will evaluate the proposed pedestrian crossing across Appleby Creek and will include a preferred crossing location as well as mitigation measures to minimize impacts (i.e. type of crossing, construction methods, timing of works, etc.).

Policy Conformity

The EER/EIA will include a section that summarizes how the proposal conforms with the various applicable environmental policies and regulations.

Monitoring

Based on the findings of the EER/EIA, a monitoring program may be required to evaluate the effectiveness of any proposed mitigation measures or environmental management strategies that will be implemented (i.e. creek re-alignment, floodplain modifications, buffers plantings, LID's, etc.).

Additional Studies

The findings and recommendations from other technical studies will be integrated into the EER/EIA where appropriate.

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

- Confirmation that the study has been completed in accordance with this red-lined TOR, with the TOR included as part of the appendices;
- All field data sheets from the completed surveys;
- A list of all agencies and individuals contacted during report preparation;
- Hard copies of the EER/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 (available upon request); and
- Boundary survey, which where appropriate, have been confirmed by a Municipal or Conservation Authority staff person.

Attachment A





C:\Dropbox\Dropbox (Beacon)\All GIS Projects\2018\218416 Oval Court\MXD\2019-05-28_Figure01_SiteLocation_218416.mxd

Site Location	Figure 1
Environmental Evaluation Report/Environmental Impact Assessment (EER/EIA) - Oval Court Redevelopment, City of Burlington	
BEACON ENVIRONMENTAL	Project: 218416 Last Revised: May, 2019
Client: Branthaven Development Corp	Prepared by: DU Checked by: AC
N 1:2,500	Inset Map:1:45,000

Contains information licensed under the Open Government License–Ontario Orthoimagery Baselayer: FBS Halton 2017

Attachment B

Anna Corrigan

From: Huycke, Adam <Adam.Huycke@halton.ca>
Sent: Wednesday, November 13, 2019 11:52 AM
To: Anna Corrigan; 'Minaji, Rosalind'
Cc: Ken Ursic; Andrew Eldebs; Emma DeFields; Jennifer Lawrence; Pasquini, Alexsandria; Keliacius, Monika
Subject: RE: ToR for Revised Scoped EER/EIA for Oval Court, City of Burlington
Attachments: RE: ToR for Scoped EER/EIA for Oval Court, City of Burlington

Good Afternoon Anna:

Further to your October 21, 2019 submission on the Revised TofR for a Scoped EER/EIA for Oval Court, Regional Staff offer the following comments for your consideration:

- As provided in our October 17, 2019 comments on the first submission of the TofR for a Scoped EER/EIS for Oval Court, Regional Staff continue to be of the opinion that the completion of the comprehensive analysis of the natural heritage and natural hazard constraints associated with the Appleby GO Station *Major Transit Station Area* (MTSA) should be completed in advance of any site specific studies being initiated. To be clear, Regional Staff are of the opinion that should the site specific analysis and subsequent development approval be sought for the subject lands in advance of the completion of the Region's and City's comprehensive analysis, that it is the expectation of the Region that the study area for the scope of the TofR would be expanded beyond the study area referred to in Figure 1. Regional Staff therefore reserve the right to reconsider our comments of the Scope of Work for the EER/EIA depending upon the timing of the submission of the development applications currently being proposed.
- The introduction states that the proponent intends to redevelop the subject lands into a *transit-oriented community designed for residential, retail and commercial uses* however no development application or concept plan was provided within the TofR. While stating this Regional Staff note that approval of the City adopted Official Plan, designations and policies has not occurred to date. The TofR should be amended to reflect this.
- The TofR should be updated to state that the dripline of the woodlands will be staked, surveyed by the proponent, and that the Regional Forester will confirm the dripline, if not already completed. The dripline should be shown on all development plans.
- Regional Staff recommend that the applicant contact Ministry of Environment, Conservation and Parks (MECP) to assist in screening and assessing for all possible species at risk (SAR) on the property as the Region has records of SWH and SAR in proximity to the area. Any correspondence with MECP should be included within the study.

The above noted comments should be addressed in a revised Terms of Reference and circulated for review and approval to Regional, City and Conservation Authority staff.

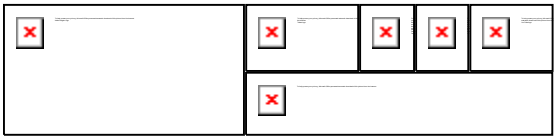
In the event that more details are provided about the proposed development, the Region reserves the right to update these comments as necessary.

Please let me know if you require anything further in this regard.

Sincerely,

Adam

Adam Huycke, MCIP, RPP, CPT
Senior Planner
Planning Services
Legislative & Planning Services
Halton Region
905-825-6000, ext. 7604 | 1-866-442-5866



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From: Anna Corrigan <acorrigan@beaconenviro.com>
Sent: Monday, October 21, 2019 4:52 PM
To: 'Minaji, Rosalind' <Rosalind.Minaji@burlington.ca>
Cc: Ken Ursic <kursic@beaconenviro.com>; Andrew Eldebs <aeldebs@branthaven.com>; Emma DeFields <edefields@hrca.on.ca>; Hudson, Brian <Brian.Hudson@halton.ca>; Huycke, Adam <Adam.Huycke@halton.ca>; Jennifer Lawrence <jennifer@jlplanning.ca>
Subject: ToR for Revised Scoped EER/EIA for Oval Court, City of Burlington

Good afternoon,

Please find attached the Revised ToR for Scoped EER/EIA for Oval Court, City of Burlington.

Regards,

Anna Corrigan, B.Sc.(Hons) / Ecologist
BEACON ENVIRONMENTAL
373 Woolwich Street, Guelph, ON N1H 3W4
T) 519.826.0419 x32 C) 905.767.1720
www.beaconenviro.com

Anna Cunningham

From: Huycke, Adam <Adam.Huycke@halton.ca>
Sent: October 17, 2019 8:40 AM
To: 'Minaji, Rosalind'
Cc: Emma DeFields (edefields@hrca.on.ca); Jennifer Lawrence (jennifer@jlplanning.ca); Andrew Eldebs (aeldebs@branthaven.com); Ken Ursic
Subject: RE: ToR for Scoped EER/EIA for Oval Court, City of Burlington

Good Morning Rosalind:

Regional Staff has now reviewed the *"Terms of Reference for Scoped Environmental Evaluation Report/Environmental Impact Assessment in Support of Redevelopment of 720, 735 & 740 Oval Court and 5135 and 5155 Fairview Street, City of Burlington, ON"* prepared by Beacon Environmental dated June 3, 2019. We offer the following for consideration by the City and the proponent in review of the proposed Environmental Report/Environmental Impact Assessment.

In consideration the of the proposed Scope Environmental Report/Environmental Impact Assessment, Regional Staff note that comprehensive planning for the Appleby Go Major Transit Station Area is currently underway in accordance with A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2019) and the Region's Official Plan (2009). As a component of this exercise, the City and the Region have been working to defined the natural heritage and hazards constraints associated with this area (e.g. Mobility Hubs Subwatershed Plans, Appleby Creek Flood and Erosion EA).

Based upon the above, Regional Staff are of the opinion that in accordance with Provincial and Regional policy, the comprehensive analysis of the natural heritage system/hazards associated with this area, and by extension, the constraints associated with the subject lands is more appropriately analysed at a comprehensive scale verses the scale of analysis being proposed in the Scope Environmental Report/Environmental Impact Assessment.

Scoped Environmental Evaluation Report/Environmental Impact Assessment (EER/EIA) Terms of Reference (ToR)

Notwithstanding the above, Regional Staff offer the following comments on the submitted scope of work:

The subject properties are located on lands that are partially within and adjacent to Halton's Natural Heritage System and are partially within and adjacent to lands designated Regional Natural Heritage System on Map 1 of the 2009 ROP. Additionally, the lands contain or are adjacent to:

- Features identified as Key Features, as illustrated on Map 1G of the 2009 ROP, including:
    - Candidate Significant Woodlands
    - Candidate habitat of endangered or threatened species
    - Significant wildlife habitat
    - Potential fish habitat
- Watercourses and floodplain areas regulated by Conservation Halton

Regional Staff recommends that the following comments be addressed and integrated into a revised TOR for further agency review, and when appropriate, approval:

1. The subject lands are located within the Appleby Mobility Hub and the City of Burlington is preparing a Scoped Environmental Impact Study with Dillon Consulting for this study area. Once this study has been completed and approved, any recommendations or mitigation measures pertaining to this subject lands should be included in this TOR/study.

2. The introduction states that the proponent intends to redevelop the subject lands into a *transit-oriented community designed for residential, retail and commercial uses* however no development application or concept plan has been submitted. Given the fact that comprehensive planning for this area has not concluded, Regional Staff are not in a position to support the proposed residential uses for the subject lands. Regional Staff recommend that since the comprehensive planning for this area has not been concluded and the appropriate land uses have not been determined, a phased approach to the study is considered as additional mitigation and monitoring may be required as more details of the project are identified.
3. **Characterization of the Biophysical Environment** – A significant woodlands assessment is required in accordance with Section 277 of the Regional Official Plan.
4. The dripline of the woodlands should be staked, surveyed and confirmed by the Regional Forester, if not already completed. The dripline should be shown on all development plans.
5. We recommend that the applicant contact Ministry of Environment, Conservation and Parks (MECP) to assist in screening and assessing for all possible species at risk (SAR) on the property as the Region has records of SWH and SAR in proximity to the area. Any correspondence with MECP should be included within the study.
6. Please include recommendations, where feasible, for all restoration and enhancement opportunities to maximize buffering capacity of the proposed buffer area.
7. CH staff provides environmental advisory and technical review services to the Region in relation to the protection of certain natural heritage features and areas and natural hazard land management. As such, it is recommended that CH staff comments relating to these matters be addressed to their satisfaction prior to the approval of this TOR.

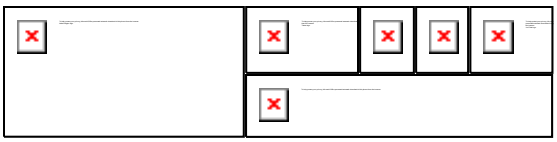
The above noted comments should be addressed in a revised Terms of Reference and circulated for review and approval to Regional, City and Conservation Authority staff. In the event that more details are provided about the proposed development, the Region reserves the right to update these comments as necessary.

We trust the above is of assistance to the City and the proponent. Please let us know if you require anything further in this regard.

Sincerely,

Adam

Adam Huycke, MCIP, RPP, CPT
Senior Planner
Planning Services
Legislative & Planning Services
Halton Region
905-825-6000, ext. 7604 | 1-866-442-5866



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From: Anna Corrigan [acorrigan@beaconenviro.com]
Sent: 03 June 2019 17:02
To: Minaji, Rosalind
Cc: Ken Ursic; 'Andrew Eldebs'; Jennifer Lawrence; 'brian.hudson@halton.ca'; 'edefields@hrca.on.ca'
Subject: ToR for Scoped EER/EIA for Oval Court, City of Burlington

Hello,

Please find attached the Terms of Reference for the Scoped Environmental Evaluation Report/Environmental Impact Assessment in Support of Redevelopment of 720, 735 & 740 Oval Court and 5135 and 5155 Fairview Street, City of Burlington, Ontario.

We look forward to receiving your feedback.

Anna Corrigan, B.Sc.(Hons) / Ecologist
BEACON Environmental
373 Woolwich Street, Guelph, ON N1H 3W4
T) 519.826.0419 x32 C) 905.767.1720
www.beaconenviro.com<http://www.beaconenviro.com/>

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Pre-Consultation – Updated Notes

720, 735, 740 Oval Court and 5135 & 5155 Fairview Street – March 29, 2021

Background:
No requirement for an additional Pre-Consultation Meeting. A Pre-Consultation Request was received from the proponent on February 16, 2021 to update Pre-Consultation Notes from the previous Meeting held on October 23, 2019. The Pre-Consultation Request was circulated to internal departments and commenting agencies on February 23, 2021 with a comment deadline of March 17, 2021. A request to update the Checklist of Required Information for Complete Application was circulated at that time.

Description of Site:
The total landholding consists of multiple parcels (720, 735, 740 Oval Court and 5135 & 5155 Fairview Street) with a total site area of approximately 4.5 hectares (11.12 acres) and frontage along Fairview Street. Existing land uses include office and industrial buildings and uses. Demolition of the existing buildings is included as a component of the overall redevelopment concept.

Adjacent and surrounding land uses include the Appleby GO Station (station platform and surface parking area) and Appleby Creek immediately to the west (and rail corridor to the north); Sherwood Forest Park to the east; commercial/industrial land uses to the north (on the north side of the rail corridor); and, low density residential land uses to the south (on the south side of Fairview Street).

Description of Development Concept:
The proposed development contemplates eight (8) mixed-use towers (ranging in height between 11 and 30 storeys) and a total of 2,086 residential units (one-bedroom; one-bedroom + den; two-bedroom models) are proposed. A total of 6,828.37 m^2 of office and 2,219.67 m^2 of retail space is proposed. The proposal also contemplates a daycare and a library. The gross floor area of the proposed redevelopment is 210,628.72 m^2 and would be completed as a phased development. Combined proposed residential/office/retail/other parking includes a total of 2,886 parking spaces.

Planning Comments:

City of Burlington Official Plan (1997), as amended

The subject lands are designated 'Mixed Use Corridor – Employment' (Schedule 'B' – Comprehensive Land Use – Urban Planning Area) of the City of Burlington Official Plan (1997), as amended.

'Mixed Use Corridor – Employment' Designation Policies (Part III, Section 5.3.4)

- Notwithstanding the policies of Part III, Subsection 5.3.2 (Mixed Use Corridors – General Policies), the following Mixed Use Corridor locations are primarily intended for higher intensity, transit and pedestrian oriented employment development and are subject to the policies of Part III, Subsection 5.3.4:

  (i) Cooke Boulevard;
  (ii) Waterdown Road;
  (iii) North side of Plains Road West, between Howard Road and Cooke Boulevard, except the north-east corner of Plains Road West and Howard Road and the north-west corner of Plains Road East and Cooke Boulevard.
  (iv) Plains Road East, between the Queen Elizabeth Way and the CNR at Glendor Avenue;
  (v) North side of Fairview Street, between Drury Lane and Guelph Line;

(vi) North side of Fairview Street, between Walker's Line and Sherwood Forest Park, except the 0.7 hectare property at 4175 Fairview Street, and the north-east corner of Fairview Street and Walker's Line and except the 6.5 hectare property at 4415 Fairview Street;
(vii) Appleby Line, between the Queen Elizabeth Way and Mainway;
(viii) Legion Road and Grahams Lane;
(ix) West side of Appleby Line, between Thomas Alton Boulevard and Palladium Way;
(x) The south-east corner of Walker's Line and Palladium Way and the north-east corner of Walker's Line and Dundas Street;
(xi) South-west corner of Walker's Line and Palladium Way; and,
(xii) 920 to 932 Brant Street.

The subject lands are located on the north side of Fairview Street; east of Walker's Line; and, west of Sherwood Forest Park and are subject to the policies of Section 5.3.4 (Mixed Use Corridor – Employment).

- The following uses may be permitted in the Mixed Use Corridor – Employment locations: industrial uses; a broad range of office uses; a limited range of retail, service commercial and personal service uses which serve the day to day needs of employees; financial institutions and services, entertainment, recreation and other community facilities such as libraries and day care centres and motor vehicle dealerships.

- Mixed Use Corridors – Employment lands are intended to provide for the retail and service commercial needs of the employment uses and their employees within and immediately adjacent to the Corridor. In addition, retail uses related to home improvement shall be permitted.

- In Mixed Use Corridor – Employment locations, residential uses shall be prohibited. In addition, individual retail and service commercial uses shall be limited to a maximum size as set out in the Zoning By-law.

- Zoning By-law regulations affecting Mixed Use Corridor – Employment locations shall be based on the following factors:

    (i) The maximum floor area ratio of development at any site shall be 1.0:1, except industrial uses, where the maximum floor area ratio shall be 0.5:1;
    (ii) The maximum building height shall be six storeys, except for industrial uses, where the maximum building height shall be two storeys;
    (iii) Buildings should be located so as to front and face the street, to provide a sense of human comfort and pedestrian scale and interest, and in close proximity to the street and to transit services; and,
    (iv) Off-street parking needs may be reduced for sites with transit-supportive designs or shared parking arrangements.

- The zoning of individual sites may not allow for the full range of permitted uses or the full extent of development intensity at every location based on site specific factors that may include, but not be limited to, traffic, land use compatibility, market impact, natural hazards and features, and environmental factors such as soil contamination.

- Transit-supportive and pedestrian-oriented urban design shall be required in the development of Mixed Use Corridor – Employment sites.

- Proposals for the re-designation of lands designated Mixed Use Corridor – Employment to allow non-employment uses, or to add a range of uses to the Mixed Use Corridor – Employment designation that are primarily permitted in a non-employment designation, shall be evaluated based on meeting the following criteria:

(i) The proposal shall only be considered in conjunction with the Comprehensive Review provisions identified in the Provincial Policy Statement and the policies of the Provincial Plans;
(ii) The proposal shall not detrimentally affect the short and long-term employment land needs of the City;
(iii) The intensity and characteristics of the proposed non-employment uses shall not detrimentally impact the viability, desirability, or the proper servicing of existing and future surrounding land uses;
(iv) The site's physical and natural characteristics, development constraints and location shall justify the consideration of non-employment uses at the subject location;
(v) The redesignation of lands abutting major transportation corridors including railways, highways and major arterial roads shall be discouraged;
(vi) Support studies as identified in Part VI, Section 5.3, Other Studies Policies of the Plan are prepared;
(vii) In addition to (i) through (iv) above, the redesignation shall also meet at least two of the following conditions:

i. The amount of land affected is minor in area based on the projected land requirements within the planning horizon of the Plan;
ii. The development of the site is not feasible for employment uses within the planning horizon of the Plan;
iii. There are no alternative sites, designated and approved for the proposed use elsewhere in the City;
iv. The proposal will have a beneficial impact on the surrounding uses and the broader community;
v. The development of the land for non-employment uses will meet a public need identified by City Council resolution.

An 'Employment Use' is defined as *the use of lands within a designated Employment, Employment Commercial or Mixed Use Corridor – Employment Area for business and economic activities, including, but not limited to, manufacturing, warehousing, offices and accessory retail and ancillary facilities, but does not include retail and service commercial uses unless they are accessory to employment uses.*

City of Burlington New Official Plan

On November 30, 2020, the Region of Halton issued a Notice of Decision approving the new Burlington Official Plan. Section 17(27) of the Planning Act (R.S.O. 1990, as amended) sets out that all parts of an approved official plan that are not the subject of an appeal will come into effect on the day after the last date for filing a notice of appeal - that date being December 22, 2020 for the new Burlington Official Plan. The appeal record submitted to the Local Planning Appeal Tribunal (LPAT) by the Region of Halton indicates that a total of 48 appeals to various parts of the new Burlington Official Plan were received during the appeal period.

Although the City is preparing a working version of the new Official Plan, it is the LPAT that will issue Orders throughout the appeal process to establish and confirm which portions of the Plan remain subject to appeal, and which portions are in effect. The City anticipates that the first of these Orders will be issued by the LPAT following the initial case management conference in this matter, which has yet to be scheduled. At the appropriate time, City staff will also bring forward a repeal by-law(s) for the former Burlington Official Plan (1997, as amended).

As the LPAT process advances, the working version of the Burlington Official Plan, 2020 is subject to change. Users of the document must satisfy themselves as to the legal status and applicability of the polices. Interested parties are encouraged to monitor the City of Burlington's website for updates regarding the LPAT process, the Burlington Official Plan, 2020 and the Burlington Official Plan, 1997:

https://www.burlington.ca/en/services-for-you/Official-Plan-Review.asp

'Urban Corridor - Employment' (Schedule 'C' – Land Use-Urban Area) within a 'Primary Growth Area' (Schedule 'B-1' – Growth Framework). The subject lands are located within the Appleby GO Major Transit Station Area (MTSA) Special Planning Area (Schedule 'H' – Appleby GO MTSA Special Planning Area) and located on a MTSA Primary Connector (i.e. Fairview Street).

- The Urban Corridor – Employment designation is intended for higher intensity employment uses. Given that major retail and residential uses are prohibited, these sites are expected to transition to accommodate employment and at-grade accessory retail and service commercial uses.
- 'Urban Corridor - Employment' designation encourages higher intensity, transit-supportive and pedestrian-oriented mixed use development in a compact built form, and to ensure an employment function on these lands, while retaining compatibility with the surrounding area.
- Transit-supportive and pedestrian-oriented design shall be required in the development of Urban Corridor – Employment lands.
- Urban Corridor – Employment lands are intended to provide for the retail and service commercial needs of the employment uses and their employees within and immediately adjacent to the Corridor.
- Uses permitted within the 'Urban Corridor - Employment' designation may include:

    - Industrial uses;
    - Office uses;
    - Accessory retail and service commercial uses which serve the day to day needs of employees;
    - Home improvement and home décor sales;
    - Automotive commercial uses, including large-scale motor vehicle dealerships existing on the date the Plan comes into effect;
    - Entertainment uses; and,
    - Recreation uses.

- A maximum floor area ratio of development of 2.0:1 is an appropriate built form in Urban Corridor – Employment lands. An increase to this floor area ratio may occur through a site-specific Zoning By-law Amendment or minor variance application, without the need for an amendment to the Official Plan, provided that the objectives of the 'Urban Corridor - Employment' designation are maintained.
- The minimum building height shall be two (2) storeys, except for industrial uses where no minimum height is required; and the maximum building height shall not exceed six (6) storeys. Where required to ensure compatibility, four (4) to six (6) storey buildings may be required to be terraced back from adjacent residential areas and/or the street.
- Urban Corridor – Employment lands shall be served by frequent transit corridors
- The addition of non-employment uses through a site-specific Official Plan Amendment shall only be permitted on lands outside the Region of Halton Employment Area where:
    (i) The subject lands meet the overall policy intent of the Urban Corridor – Employment designation; and,
    (ii) The proposed development ensures the inclusion of sufficient space to retain a similar number of jobs currently located on the site, or where the site is currently underutilized or vacant, the number of jobs proposed on the site should achieve 50 jobs per net hectare; and,
    (iii) Where the proposed development is located within an MTSA Special Planning Area and is proposed in advance of an area-specific plan the policies of Section 8.1.2 (Major Transit Station Areas) of this Plan shall apply.

Section 8.1.2 – Major Transit Station Areas (MTSAs)

- Policy objectives of the MTSAs include the development of compact, pedestrian, environmentally sustainable and transit-supportive places each with a distinct character and to promote intensification in order to achieve transit-supportive residential and employment density targets.
- To require a mix of uses within development and throughout each MTSA that will strengthen the live/work/shop relationship and support the creation of complete communities.

- To support the retention and expansion of existing employment function and encourage new employment functions and employment uses which are compatible with other uses and serve to make each MTSA an employment destination within the city.
- To provide low-rise, mid-rise and tall building forms, where appropriate, that support a variety of demographics in MTSAs and to provide opportunities for a range of small and medium-scale retail and service commercial uses that serve the needs of residents and employees in the MTSAs.
- To promote the accommodation of a diverse range and mix of household sizes, household incomes and housing tenure.
- To ensure that there is an appropriate transition in scale, intensity, height, massing and spacing of development including appropriate transitions between various land uses.

- In advance of the completion of *area-specific plans* or major planning studies and the approval of the implementing Official Plan amendments for the *Major Transit Station Areas*, the policies contained in Subsection 8.1.2 of this Plan, *shall* apply to *development applications* in the MTSA Special Planning Areas and Urban Growth Centre, as shown on Schedule B, of this Plan.
- *Development applications* preceding the completion of an area-specific plan or major planning study and the approval of the implementing Official Plan amendments *shall* have regard for the Province's Mobility Hubs and Transit- Supportive Guidelines, *shall* implement Regional and Provincial major transit station area policies and *shall* be consistent with the goals and objectives of the existing land use designation as contained in this Plan.
- *Development* in *MTSAs should* be planned to achieve *transit-supportive* densities in accordance with the Province's Transit Supportive Guidelines and the existing and planned level and type of transit service. The full extent of maximum *development* permissions on lands located in each *MTSA may* not be achievable on every site, due to site-specific factors including, but not limited to, *compatibility*, environmental impacts, hazard lands, transportation issues, *cultural heritage resources* and/or *infrastructure* capacity.
- *Development shall* contain a mix of land uses and *transit supportive development* that supports the achievement of *complete communities* through a more *compact built form*, while ensuring *compatibility* with surrounding areas is achieved.

Employment Lands Policy Summary

As noted in PB-04-18 Revised Proposed New Official Plan Recommended for adoption and in PL-22-20 New Official Plan – Region of Halton Draft Notice of Decision, lands recommended for redesignation that are City-designated employment lands, that are not within the Region's Employment Area, have proceeded through the approval of the adopted Official Plan. Where located within a Major Transit Station Area (MTSA) Special Planning Area, these lands will retain the existing employment-oriented land use designation on Schedule C of the Official Plan (2020) until such time as the respective area-specific plans are approved. These lands are expected to be redesignated as a result of the area-specific plan for each respective area. Where these lands are not within a MTSA Special Planning Area a new land use designation has been established in either Schedule C: Land Use – Urban Area or Schedule E: Land Use – Uptown Urban Centre. Please see Appendix E of PB-04-18: Lands recommended for redesignation found within the Areas of Employment as defined by the City's existing Official Plan that are not located on the Halton Region's Employment Area overlay, for more details. The purpose of this appendix is to provide a record of the lands proposed to be redesignated within the existing Area of Employment, as defined in the City's existing Official Plan, that are not located within the Region of Halton Employment Area overlay.

Based on the development proposed, an **amendment to the City of Burlington Official Plan is required.**

NOTE: Section 22(2.1) of the *Planning Act* states that no person or public body shall request an amendment to a new official plan before the second anniversary of the first day any part of the plan comes into effect. Exceptions include where a council has declared by resolution that such a request is permitted (including a specific request, a class of requests or in respect of such requests generally).

***Current Zoning* (Mixed Use Corridor – Employment Oriented ('MXE') Zone**

The submission of the Pre-Consultation Request Form indicated a proposed zoning category to a site-specific Regional Commercial Exception ('CR-XX') Zone. Site-specific amendments proposed may include those to permitted uses, zone provisions and regulations, including but not limited to, maximum permitted building height and residential density.

Based on the development proposed, an **amendment(s) to the Zoning By-law is/are required.**

Preliminary Planning Comments

A request for a Technical Pre-Consultation Review was submitted in December 2020 and circulated to applicable internal departments on December 16, 2020 with a comment deadline of January 29, 2021. Community Planning Department Technical Pre-Consultation Comments were provided to the proponent on January 28, 2021. It is noted that these comments are to be read in conjunction with the Pre-Consultation Meeting Notes and Checklist from October 2019 and these Updated Pre-Consultation Comments (March 2021). Due to the expiry of the October 2019 Pre-Consultation Meeting Notes, updated Pre-Consultation Comments and Checklist of Required Information for Complete Application are to be re-issued.

- **Urban Design**
  The proposed development is to be evaluated against the applicable design principles and guidelines of the City's Tall Building Guidelines. Official Plan policies related to architectural and urban design will need to be reflected in the proposed development and in the particulars of the amending zoning by-law. Should the application(s) proceed as a proposal for a tall building, the City of Burlington *Tall Building Guidelines* are applicable to the proposed development. A copy of these guidelines can be found at https://www.burlington.ca/uploads/92/Doc_636984525830848089.pdf.

- **Planning**
  The City of Burlington initiated a Mobility Hub Study/Precinct Plan in 2016. The project was subsequently put on hold with recent changes to Provincial policy (i.e. Growth Plan) which gave upper-tier municipalities (i.e. Region of Halton) the authority to establish Major Transit Station Area (MTSA) boundaries and densities. This initiative is ongoing at the Region through the work being done as part of the Regional Official Plan Update (Municipal Comprehensive Review). The City is anticipating confirmation from the Region of the final boundaries and densities for the MTSAs within City limits, which will then be implemented through the completion of an Area-Specific Plan (i.e. Secondary Plan) for lands in the vicinity of the Appleby GO Station to establish the appropriate policy framework.

- **Employment Lands**
  The proposed conversion of existing employment lands would be subject to the applicable policies and criteria of the City of Burlington Official Plan (1997) and New Official Plan. Region of Halton Official Plan policies (i.e. Employment Lands Mapping) and Provincial policy with respect to Employment Lands Conversions, including the requirement for a municipal comprehensive review, will apply.

Proponents are to confirm applicability of and conformity to these policies, and others, upon the submission of any development application(s), including planning rationale where these policies cannot be met.

- Please prepare and submit a 'revisions matrix table' which illustrates the specific revisions that have been made to the proposal since the original Pre-Consultation Meeting in October 2019.

- The subject lands are located adjacent to an existing rail corridor. Official Plan policy discourages development of sensitive (i.e. residential) land uses adjacent to rail lands with a proviso that such development proposals are accompanied by technical studies (i.e. vibration and/or noise) within 75 metres and 300 metres, respectively, of a railway right-of-way or railway yard.

Community Planning Department staff will require significant planning rationale, including proposed measures that may mitigate the location of a sensitive land use in this location and context.

Heritage Planning Comments

The lands known as 720, 735, 740 Oval Court and 5135 & 5155 Fairview Street are not listed on the City of Burlington Municipal Register nor are they designated pursuant to the *Ontario Heritage* Act. Further, there are no identified cultural heritage resources identified on any lands adjacent to the subject properties.

Application Requirements

- **Official Plan Amendment and Zoning By-law Amendment Applications are required.**
- Prior to submitting the application, a Pre-Application Community Meeting is required. Please refer to the provided Applicant's Guide to Pre-Application Public Consultation.
    - The Pre-Application Community Meeting is to be organized by the Applicant and must be held before the submission of an application(s).
    - Circulation of the meeting invitation to residents and tenants within 120 metres of the development site will be completed by the City for a fee. Provide a PDF of the meeting invitation on the applicant's letterhead for distribution. Notice must be sent a minimum of 20 days in advance of the meeting.
    - Please notify the Ward Councillor, and the Coordinator of Development Review of the date, time and location of the meeting. Be sure your meeting location is accessible and close to the development site. Due to the current COVID-19 situation, the meeting may be held virtually. Please contact Kyle Plas, Coordinator of Development Review, at kyle.plas@burlington.ca for further instructions on hosting a virtual meeting.
    - During the meeting, provide a detailed overview of the development proposal and allow time for questions and comments from the public. Take notes of the discussion.
    - As part of a complete application, the applicant must provide Pre-Application Community Meeting Minutes which include a written summary of public input received at the meeting. As part of the Planning Justification Report, the applicant must explain how this public input was used to modify the development proposal.

The proponent submitted a request a for Pre-Application Community Meeting in December 2020. A virtual Pre-Application Community Meeting was held on February 11, 2021 (7:00 PM to 9:00 PM). A Development Projects Webpage has been created and is live (burlington.ca/ovalcourt) and Notices were sent on January 25, 2021.

- Prior to submitting the application, consultation with the Burlington Urban Design Advisory Panel (BUD) will be required.
    - An Urban Design Brief will be required to explain how the City's Urban Design Guidelines have been addressed and how the comments of BUD have been taken into account.
    - A copy of the BUD meeting minutes must be submitted with the application. BUD Terms of Reference are provided as an attachment.

A Burlington Urban Design Advisory Panel (BUD) Meeting was held on January 21, 2020. Meeting Minutes were provided to the proponent on February 10, 2021 for submission as part of a Complete Application.

- A Shadow Study will be required to show how the proposed buildings and site designs will impact adjacent development, the public realm, proposed outdoor amenity areas, and surrounding public open spaces and private outdoor amenity areas. Please refer to the City's Shadow Study Guidelines and Terms of Reference (attached) when preparing the Shadow Study.
- A Quantitative Wind Assessment ('Wind Tunnel Test') will be required to show how the proposed building and site design will impact pedestrian comfort on the street and surrounding public and private open space areas. Please refer to the City's Pedestrian Level Wind Study Guidelines and Terms of Reference.

- Please consider sustainable building design in your proposed development. An introductory letter from the Burlington Sustainable Development Committee and a copy of the Burlington Sustainable Building and Development Guidelines are provided as an attachment.
- A Planning Justification Report is required:
    - to discuss the impact of Provincial, Regional, and local planning policy on the proposed development;
    - to explain why the requested increase in height, density, and floor area ratio is desirable and represents good planning;
    - to discuss how the results of the required technical studies have been used to refine the redevelopment proposal;
    - to explain how input received at the pre-submission neighbourhood meeting has been used to refine the proposal;
    - to explain how input received from the Burlington Urban Design Review Panel has been used to refine the proposal;
    - to explain how the proposed development is compatible with surrounding land uses, including height, setbacks, massing and design and community features.

- Community Benefits (Section 37) may be required.

Region of Halton Planning Comments (Updated March 2021):

Regional Official Plan, 2009

Designation: Urban Area (Built Boundary)

Urban Area

- The Urban Area (Section 77) policies support a compact form of growth that is supportive of transit and non-motorized forms of transportation, that takes place commensurately both within and outside of the *Built Boundary*, and is focused on the *development* of *Intensification Areas*. Further, development within the Urban Area is subject to Local Official Plan policy and direction. The ROP also provides identifying that the proper integration of uses with the surrounding neighbourhoods through urban design.
- The subject lands are located in close proximity to Appleby Go Station, which is identified as being a Major transit Station Area on Map 1 of the ROP. Major Transit Station Areas (MTSA) are regional identified *Intensification Areas.* These areas are to achieve increased residential and employment densities (as prescribed by the Region's Official Plan) in order to ensure viability of the existing planning transit function.
- In accordance with Provincial Growth Plan (2019) policy, for *major transit station area* on *priority transit corridors*, *upper-tier municipalities* (Halton Region) in consultation with the *lower-tier municipality* (City of Burlington) will delineate the boundaries of these areas in accordance with provincial direction. Please note that the Region is currently engaged in the Municipal Comprehensive Review (MCR) process, and that a decision on the region's growth strategy, including a decision on the Major Transit Station Area (MTSA) boundaries has not been provided to date.
- Additionally, the Region's Official Plan (Section 48, 77 (5) and Section 81 (3)) provides that *Area Specific Plans* are required for the development of new *Intensification Areas*. An approved *Area Specific Plan* would provide for the planned comprehensive development for the area. Any application received in advance of the approval of an *Area Specific Plan* may be considered premature. Should a development application be submitted in advance of completion of the Area Specific Plan process, careful consideration of the proposed intensification of use for the subject lands needs to be given in the context of the Region's growth management strategy.
    - Matters to be addressed should an application be submitted in advance of the completion of the Regional Comprehensive Review and City of Burlington *Area Specific Plan* for this area:
        - Consideration and evaluation of Section 77(5) of the ROP;
        - Comprehensive evaluation of the municipal services within the area consistent with the Region's Area Servicing Plan requirements;

        - Comprehensive evaluation of traffic impacts for the area and the proposed development (also subject to City of Burlington input).
        - Comprehensive analysis of flooding, floodplains and Regional Natural Heritage System impacts.

- Section 84 of the ROP speaks to the goal of housing is to supply the Region with an adequate mix of housing types. Additional housing polices in the ROP speak to making efficient use of serviced lands to increase the supply of housing, and encouraging Local Municipalities and the development industry to be innovative in housing designs.
- Section 89 of the Regional Official Plan require that approvals for all new development within the Urban Area be on the basis of connection to Halton's municipal water and wastewater systems, unless otherwise exempt by other policies of this Plan.

Regional Natural Heritage System:

- The subject properties are located on lands that are partially within and adjacent to Halton's Natural Heritage System and are partially within and adjacent to lands designated Regional Natural Heritage System on Map 1 of the 2009 ROP. Additionally, the lands contain or are adjacent to:
    - Features identified as Key Features, as illustrated on Map 1G of the 2009 ROP, including:
        - Candidate Significant Woodlands
        - Candidate habitat of endangered or threatened species
        - Significant wildlife habitat
        - Potential fish habitat
    - Watercourses and floodplain areas regulated by Conservation Halton

- In accordance with ROP policy, the completion of a Subwatershed Study as part of the Area Specific Plan process is required. This report will form the basis for any environmental implementation report.
- In accordance with Regional Official Plan policy, an Environmental Impact Assessment is required to support the redevelopment of these lands. Of note, on October 17, 2019, the Region provided a detailed response to the City and the proponent on the Terms of Reference for the scoping of an Environmental Impact Assessment. Regional Staff are of the opinion that the Terms of Reference should be revisited to ensure that the extent of required study remains appropriate.

Potential for Site Contamination

- In accordance with S.147(17) of the Region's Official Plan states that a property is to be free of contamination prior to any development/change of use taking place.
    - Submission of a Regional Environmental Site Screening Questionnaire is required in addition to A Phase 1 (at minimum) (to O. Reg 153/04 standards and with a Letter of Reliance). Additional Environmental Site Assessments may be required depending upon the recommendation(s) of the Phase 1 ESA. A mandatory Records of Site Condition filing appears to be required as the proposal will result in a change in use to a more sensitive land use.

Archaeological Potential

- According to Regional mapping, the subject lands are not identified as having archaeological potential. As these lands have been previously developed and disturbed by related activities, an archaeological assessment is not required. The owner/developer is cautioned that should archaeological resources be uncovered onsite, that the appropriate authorities are contacted.

Land use Compatibility, D-Series Guidelines Assessment:

- The subject lands are located in close proximity to a number of uses that have the potential for adverse effects on the proposed use. In addition, the proposed use may pose additional impact and restriction on the adjacent employment areas. In accordance with Provincial and Regional direction, Land Use Compatibility Assessment is required to support the proposed use. This assessment is to include noise,

vibration, dust and air quality impact assessment and may subject to a Peer Review. In accordance with Regional Official Plan policy, the cost of such Peer Review will be at the applicants cost.

- In addition to the above, the subject lands are located in close proximity to an active railway corridor. In accordance with Regional Official Plan policy, the following studies are required to address railway impacts/adverse effects:
    - Noise Impact Study
    - Vibration Study
    - Air Quality Assessment (may be subject to Peer Review)

Waste Management:

- A Waste Management Plan is required to address waste collection for the proposed development. Please reference the Region's Development Design Guidelines for Source Separation of Solid Waste for site design requirements/dimensions.

Municipal Servicing:

- There are Halton Region local watermains within Fairview Street and Oval Court Road adjacent to the proposed development. There is a trunk watermain within Fairview Street adjacent to the proposed development. No trunk watermain service connection laterals will be permitted.
- There is a Halton Region local wastewater main within Oval Court adjacent to the proposed development. There is a Halton Region trunk wastewater main (sanitary sewer) within Fairview Street adjacent to the proposed development. Any proposed trunk wastewater main connection requires special review and Regional permission to connect into, and it should be noted that permission is not always guaranteed.
- The developer should undertake to locate the size and location of all watermains, water services, water meters, wastewater mains (sanitary sewers), wastewater (sanitary) services, stormwater mains and stormwater services that exist within the road right-of-ways, to the properties and within the properties and place them on an Existing Site Servicing Plan drawings within their reports. Public and private utility companies can be utilized for this purpose.
- An Area Servicing Plan is required as part of the Major Transit Station Area (MTSA) Area Specific Plan study to support the comprehensive planning for servicing to support the area and planned growth. This exercise should be completed in advance of any site-specific development applications and the completion of site specific servicing reports (please see planning comments above). Should a development application be submitted in advance of the completion of the Area Specific Plan process as previously discussed, the scope of an Functional Servicing Report will need to be discussed and approved by the Region, the City and Conservation Halton.
- To support a complete application following the approval of an Area Specific Plan, a Functional Servicing Report will required to be prepared by the developer's civil engineering consultant (watermains, water services, fire hydrants, sanitary sewer mains, sanitary sewer services, stormwater mains and stormwater services) to show options for how the property is proposed to be serviced according to City of Burlington and Halton Region standards. Local watermain and wastewater main (sanitary sewer) hydraulic analysis should be completed by the developer's consultant as well for the local sewers and the drainage area down the to the nearest trunk sewer. The consultant should include details about other developments properties in the drainage area in their analysis of the local sewers (if any). The report should speak to the number/type of units proposed and the phasing of the development with respect to the impacts on the Region's water distribution system and wastewater collection system. Phasing, timing of the development, and required/available capacity shall be detailed in the report. The consultant will include details about potential external main upsizing or main extensions to accommodate the development, etc..
- The FSR should speak to how it aligns with any greater Area Servicing Plan that is undertaken for the undermentioned municipal Planning Studies, including the upcoming Region's Official Plan Review, and required Master Servicing Plans, Background Studies and formal Programs.
- The FSR report should incorporate Fire Flow Rate Testing. The proponent should undertake fireflow rate testing of representative Regional fire hydrants in the area, with the proponent's fireflow contractor and Region forces present. Include within the Report a copy of the fireflow rate testing results, and the Fire

Underwriters Survey (FUS) requirements for the development. This information will help to assist in informing the watermain design and watermain hydraulic modelling analysis that is being undertaken by the proponent's consultants.

- Further to the formal hydraulic analysis requirement, the developer's consultant can utilize the Region's current water and wastewater models (if required). The developer's civil consulting engineering firm will be required to enter into a Data License Agreement prior to obtaining any digital information from the Region.
- The FSR should include information related to all the other Utilities infrastructure in the area and potential conflicts.
- The FSR should show the existing site services and note how they are proposed to be decommissioned to make way for the development.
- New development must be on the basis of full municipal services.
- The developer should be aware of the Region's Multi-Unit Servicing Policy with respect to the number and location of water meters.
- Regional policies state that water and sanitary services cannot cross lot lines, the owner will ensure this throughout the process. Each lot must be independently serviced if it is proposed to be a separate lot.
- Any major servicing works required for this project would fall under the Regional Servicing Agreement process, including securities, Agreement registration, developer's liability insurance and the payment of Agreement fees.
- Servicing of a standard nature is required to go through the Regional Services Permit process.
- The size and scope of, utility trench and road cut, road restoration shall be to the satisfaction of the City of Burlington for local roads.
- Watermain and wastewater main (sanitary) servicing capacity is not guaranteed at the LOPA and ZBA stage. Servicing of development in the Burlington area of Halton Region is on a first-come-first-serve basis. The owner can pre-consult about servicing capacity with the Region at any time in the future going forward. This current development proposal capacity will be reviewed closely and commented upon at the time of Planning application receipt. Should a servicing capacity issue be identified at that time then it will have to be dealt with, working through it with the Region. Servicing capacity is deemed to be in hand at the issuance of a Regional Servicing Agreement, Special Financial Agreement, and Regional Services Permit, which is reviewed and obtained toward the end of the City's Site Plan approval process, or Regional Servicing Agreement.
- As always, acquiring land for development purposes and hiring consultants, at this time, is at the risk of the developer.
- Any water services and sanitary services that currently exist to the property that will not be utilized for any reason will be required to be disconnected right at the respective main by the developer.
- The developer's site servicing consultant can consult with the Region at any time regarding their proposed draft site servicing water design, wastewater design and identified utility conflicts (including storm).
- The Region would like to receive confirmation in writing when any required formal land assembly has taken place at the LOPA and ZBA stage in order for servicing to conform with Regional Policies, that water and wastewater services do not and will not cross lot lines for different property owners.
- The developer will inform the City, and the Region, whether they will be submitting a Site Plan application at the same time as the LOPA and ZBA applications for timing purposes and issues identification and resolution purposes.

Regional Transportation:

- The subject lands are located in close proximity to a Regional Road 20 (Appleby Line). In accordance with ROP policy direction, the Region will be requiring the following:
  - Traffic Impact Study (TIS): Required
    - The TIS must be completed by a qualified Transportation consultant for the proposed development. The study must be completed as per Halton's Traffic Impact Study Guidelines. The final study, its assumptions & recommendations must be to the satisfaction of Transportation Planning and approved by Halton Region. The TIS Guidelines are available on-line at https://www.halton.ca/The-Region/Regional-Planning/Regional-

Official-Plan-%28ROP%29/About-Regional-Official-Plan-%28ROP%29/Regional-Official-Plan-Guidelines

        - A Scope of Work for the TIS is required for review and approval prior to the start of the study.
        - As previously noted, should a development application be submitted in advance of the competition of the Area Specific Plan, the scope of the TIS will need to be more comprehensive.
    - Noise Study: Required
        - A Noise Study must be completed by a qualified Noise consultant for the proposed development. The study must be completed as per Halton's Noise Abatement Policy and Noise Abatement Guidelines. The final study, its assumptions & recommendations must be to the satisfaction of Transportation Planning and approved by Halton Region
        - A Scope of Work for the Noise Study is required for review and approval prior to the start of the study.

Submission Requirements:

- All submission materials on a USB
- Applicable Regional Fee(s)
- Complete Application forms
- Planning Justification Report
- Concept Plans
- Environmental Site Screening Questionnaire, Phase 1 & Phase 2 Environmental Site Assessment (ESA) in addition to any recommended ESA (O.Reg 153/04 standards and with a Letter of Reliance)
- Environmental Impact Assessment
- Area Servicing Plan/Functional Servicing Study
- Traffic Impact Study
- Noise Impact Study
- Vibration Study
- Air Quality Assessment
- Land Use Compatibility Assessment
- Waste Management Plan

For additional information and/or clarification of Region of Halton Planning comments, please contact Adam Huycke at adam.huycke@halton.ca.

Region of Halton Servicing Comments (Updated March 2021):

- There are Halton Region local watermains within Fairview Street and Oval Court Road adjacent to the proposed development. There is a trunk watermain within Fairview Street adjacent to the proposed development. No trunk watermain service connection laterals will be permitted.
- There is a Halton Region local wastewater main within Oval Court adjacent to the proposed development. There is a Halton Region trunk wastewater main (sanitary sewer) within Fairview Street adjacent to the proposed development. Any proposed trunk wastewater main connection requires special review and Regional permission to connect into, and it should be noted that permission is not always guaranteed.
- The developer should undertake to locate the size and location of all watermains, water services, water meters, wastewater mains (sanitary sewers), wastewater (sanitary) services, stormwater mains and stormwater services that exist within the road right-of-ways, to the properties and within the properties and place them on an Existing Site Servicing Plan drawings within their reports. Public and private utility companies can be utilized for this purpose.
- An Area Servicing Plan is required for the Major Transit Station Area (MTSA) Special Planning Area, including the proposed development, the timing and scoping are to be discussed. A Functional Servicing Report is required to be prepared by the developer's civil engineering consultant (watermains, water services, fire hydrants, sanitary sewer mains, sanitary sewer services, stormwater mains and stormwater

services) to show options for how the property is proposed to be serviced according to City of Burlington and Halton Region standards. Local watermain and wastewater main (sanitary sewer) hydraulic analysis should be completed by the developer's consultant as well for the local sewers and the drainage area down the to the nearest trunk sewer. The consultant should include details about other developments properties in the drainage area in their analysis of the local sewers (if any). The report should speak to the number/type of units proposed and the phasing of the development with respect to the impacts on the Region's water distribution system and wastewater collection system. Phasing, timing of the development, and required/available capacity shall be detailed in the report. The consultant will include details about potential external main upsizing or main extensions to accommodate the development, etc..

- The FSR should speak to how it aligns with any greater Area Servicing Plan that is undertaken for the undermentioned municipal Planning Studies, including the upcoming Region's Official Plan Review, and required Master Servicing Plans, Background Studies and formal Programs.
- The FSR report should incorporate Fire Flow Rate Testing. The proponent should undertake fireflow rate testing of representative Regional fire hydrants in the area, with the proponent's fireflow contractor and Region forces present. Include within the Report a copy of the fireflow rate testing results, and the Fire Underwriters Survey (FUS) requirements for the development. This information will help to assist in informing the watermain design and watermain hydraulic modelling analysis that is being undertaken by the proponent's consultants.
- Further to the formal hydraulic analysis requirement, the developer's consultant can utilize the Region's current water and wastewater models (if required). The developer's civil consulting engineering firm will be required to enter into a Data License Agreement prior to obtaining any digital information from the Region.
- The FSR should include information related to all the other Utilities infrastructure in the area and potential conflicts.
- The FSR should show the existing site services and note how they are proposed to be decommissioned to make way for the development.
- New development must be on the basis of full municipal services.
- The developer should be aware of the Region's Multi-Unit Servicing Policy with respect to the number and location of water meters.
- Regional policies state that water and sanitary services cannot cross lot lines, the owner will ensure this throughout the process. Each lot must be independently serviced if it is proposed to be a separate lot.
- Any major servicing works required for this project would fall under the Regional Servicing Agreement process, including securities, Agreement registration, developer's liability insurance and the payment of Agreement fees.
- Servicing of a standard nature is required to go through the Regional Services Permit process.
- The size and scope of, utility trench and road cut, road restoration shall be to the satisfaction of the City of Burlington for local roads.
- Watermain and wastewater main (sanitary) servicing capacity is not guaranteed at the LOPA and ReZoning stage. Servicing of development in the Burlington area of Halton Region is on a first-come-first-serve basis. The owner can pre-consult about servicing capacity with the Region at any time in the future going forward. This current development proposal capacity will be reviewed closely and commented upon at the time of Planning application receipt. Should a servicing capacity issue be identified at that time then it will have to be dealt with, working through it with the Region. Servicing capacity is deemed to be in hand at the issuance of a Regional Servicing Agreement, Special Financial Agreement, and Regional Services Permit, which is reviewed and obtained toward the end of the City's Site Plan approval process, or Regional Servicing Agreement.
- The property is located within a City of Burlington MTSA, Mixed Use Nodes and Intensification Areas, and Primary Growth Area, within the city. Halton has initiated a Regional Municipal Comprehensive review process, ie. the Halton Region Official Plan review for the Region. Halton Region has also initiated a Water and Wastewater Master Servicing Plan review exercise for the Region, together with, and in time, Background Studies and formal Programs. Please see the Planning comments for more context.
- As always, acquiring land for development purposes and hiring consultants, at this time, is at the risk of the developer.

- Any water services and sanitary services that currently exist to the property that will not be utilized for any reason will be required to be disconnected right at the respective main by the developer.
- The developer's site servicing consultant can preconsult with the Region at any time regarding their proposed draft site servicing water design, wastewater design and identified utility conflicts (including storm).
- The Region would like to receive confirmation in writing when any required formal land assembly has taken place at the LOPA and ReZoning stage in order for servicing to conform with Regional Policies, that water and wastewater services do not and will not cross lot lines for different property owners.
- The developer should prepare a Solid Waste Management Plan to the satisfaction of the Region. The Plan shall have regard for the Region's Solid Waste Management Guidelines. The Solid Waste Management Guidelines are available on-line at http://www.halton.ca , Regional Official Plan (ROP) Guidelines, Development Design Guidelines for Source Separation of Solid Waste.
- The developer will inform the City, and the Region, whether they will be submitting a Site Plan application at the same time as the LOPA and ReZoning applications for timing purposes and issues identification and resolution purposes.

For additional information and/or clarification of Region of Halton Servicing comments, please contact John Kisneris at john.kisneris@halton.ca.

Conservation Halton Comments (Updated March 2021):

Ontario Regulation 162/06

Conservation Halton (CH) regulates all watercourses, valleylands, wetlands, Lake Ontario and Hamilton Harbour shoreline and hazardous lands, as well as lands adjacent to these features. The subject properties are adjacent to lands traversed by Appleby Creek and contain the flooding and erosion hazards associated with that watercourse. CH regulates a distance of 7.5 metres from the greater of the limit of the flooding or erosion hazard for this particular site. Permission is required from CH prior to undertaking any development within CH's regulated area and must meet CH's *Policies and Guidelines for the Administration of Ontario Regulation 162/06* (https://conservationhalton.ca/policies-and-guidelines).

As per CH Policy, no new development (structures, fill, grading, parking, etc.) is permitted within CH's regulated area, and, at a minimum, safe access and egress will need to be provided in accordance with the Provincial Policy Statement for proposed development.

The following regulated hazards will need to be delineated through technical studies on a topographic survey, signed and stamped by an Ontario Land Surveyor:

- **Regulatory floodplain**, through a comprehensive floodplain analysis. Updated hydrologic/hydraulic models are required. Modelling from the Mobility Hub study may be used as the baseline for this purpose. Contact City and CH regarding specific requirements.
- **Physical top of bank** as staked by CH staff on October 19, 2018.
    - Please provide CH a digital copy of this survey to confirm its use for the future application
- **Long term stable top of bank** as determined through a geotechnical slope stability assessment prepared by a qualified geotechnical engineer (to be retained by the applicant). The long term stable top of bank will either be coincident with or further landward of the staked top of bank.
- **Meander Belt** as determined through fluvial geomorphologic assessment. Please contact CH to confirm specific requirements before undertaking assessments.

The above will need to be delineated for both existing and proposed conditions.

Any development (i.e. infrastructure, etc.) that is proposed within the regulated area (e.g. creek modification, stormwater outfalls, culverts, bridges) will be subject to CH Policies and require CH Permits.

All other proposed development (structures, fill, grading, underground/surface parking, etc.) must be outside of the regulated area (i.e. further than 7.5m from the creek hazards). It must be demonstrated that the proposed development can be constructed without disturbance to the regulated area.

Further preconsultation with CH staff is recommended to confirm requirements for CH to consider the pedestrian bridge. As per CH Policy, watercourse crossings shall be minimized and designed in accordance with CH Policies 2.19 – 2.20. Access to the valley corridor for watercourse crossings shall be minimized and designed to take advantage of existing impacted or open areas on the valley slope. At a minimum, the design of the proposed pedestrian bridge will need to allow for natural channel migration, fish/terrestrial passage, sediment transport, and minimize risk to infrastructure, among other requirements. The technical studies required for the proposed development will need to provide enough detail to assess and support the proposed crossing.

As underground parking is proposed, a hydrogeological study, including water balance, is necessary to ensure the development will not impact the creek. CH's "Requirements for completion of hydrogeological studies to facilitate Conservation Halton's review, November 2014" should be referenced in preparation of the study; available online: https://www.conservationhalton.ca/policies-and-guidelines

Planning Act Applications

Through the forthcoming Planning Applications, CH will recommend that the regulated lands (i.e. 7.5m from the greater of the limit of the flooding or erosion hazards) be zoned for protection (e.g. O2) and placed into public ownership. As such, new lot lines should be outside of the regulated area. Through the Planning process, any existing development within the regulated area should be removed and the lands restored in accordance with CH's Landscaping and Tree Preservation Guidelines.

Major creek alterations require justification and evaluation through a comprehensive study such as a subwatershed study or Environmental Assessment (EA) and must meet CH Policy 2.19. Staff understands that the proposed development is relying on works that are to be completed in accordance with the City's Appleby Creek Flood and Erosion EAs. Upgrades to the existing Fairview Street bridge/culvert may need to occur prior to development to ensure flood free access and egress is provided. At minimum, safe access and egress will be required. If the proposed development relies on proposed creek/hazard modifications, all supporting documentation must be submitted for review and approval through this application in order to confirm zoning boundaries and development limits. Such works would need to be completed to the satisfaction of CH prior to development, and may need to occur in support of the ZBA application. As such, coordination with the City in this regard is recommended.

CA/Halton MOU

CH requests to review the following per the Memorandum of Understanding with the Region and City:

- Stormwater Management (SWM) Report – CH works with City staff in determining the SWM criteria. Additional information would be required to assess whether any outlets to the regulated area could be supported as a CH Permit would be required. Stormwater should be directed to existing storm sewers if possible. Staff recommends pre-to-post water balance and incorporation of Low Impact Development (LID) features.
- Environmental Impact Assessment (EIA)
    - The EIA should follow the Terms of Reference (ToR) approved by the City, Region and CH
        - As per email from A. Cunningham to E. DeFields on November 24, 2020, the ToR dated October 2, 2020 should be updated to indicate that the EIA will evaluate the proposed pedestrian crossing and will include a preferred crossing location as well as mitigation measures to minimize impacts (i.e. type of crossing, construction methods, timing of works, etc.) in anticipation of the final Precinct Plan continuing to show an active transportation link between the Oval Court lands and the Appleby GO Station
    - The EIA should assess the presence of fish habitat and determine appropriate buffers to demonstrate no negative impact on fish habitat

General Submission Requirements:

- Topographic survey delineating hazards and 7.5m regulatory allowance, for existing and proposed conditions
- Constraints plan delineating existing and proposed hazard lands, regulated allowance, fisheries setback from bankfull, NHS limits and buffers, etc.
- Site Plan and Engineering Drawing Set, including existing and proposed conditions (i.e. grading, servicing, erosion & sediment control plans)
- Landscape and Tree Preservation Plans; Restoration Plans
- Geotechnical Slope Stability Assessment, prepared by a qualified geotechnical engineer
- Hydrogeological Study (including water balance)
- Comprehensive Floodplain Analysis, hydraulic and hydrologic modelling for existing and proposed conditions (consult with CH and City staff to confirm specifics). Modelling from the Mobility Hub study may be used as the baseline for this purpose
- Meanderbelt and fluvial geomorphological assessment considering proposed works (consult with CH staff to confirm specific requirements before commencing assessment)
- Stormwater Management Report / Functional Servicing Report
- Environmental Impact Assessment
- Conservation Halton Permits for any work within the Regulated Area

CH Fees

Please contact CH prior to applying to confirm fees based on the current years fee schedule at the time of submission. An estimate based on 2021 fee schedule is below:
OPA (Large >2ha) = $18,994
ZBA (Large >2ha) = $18,994 x 0.75 (combined application fee) = $14,245.5
Total = $33,239.5
***additional fees will apply for CH Permits**

Please note that CH has had prior meetings and correspondence with the applicant's team, which should be referenced for further requirements along with the above preconsultation notes (see below):

- **October 19, 2018**: Top of bank staking by CH staff
- **November 12, 2018**: CH Letter re: preliminary hydraulic analysis/flood mitigation
- **December 12, 2018**: Informal preconsultation meeting at City
- **April 5, 2019**: Meeting at CH office re: creek modifications
- **April 15, 2019**: Email - April 5th meeting minutes (J. Lawrence to E. DeFields)
- **May 22, 2019**: Email - CH follow up to April 5th meeting minutes (E. DeFields to J. Lawrence)
- **October 23, 2019**: Formal preconsultation at the City
- **December 12, 2019**: Meeting at City with Aquafor Beech re: Erosion Control EA
- **October 16, 2019, December 18, 2019, March 17, 2020, November 20, 2020**: Correspondence re: Environmental Impact Assessment Terms of Reference

For additional information and/or clarification of Conservation Halton comments, please contact Ola Panczyk at opanczyk@hrca.on.ca.

City of Burlington Engineering Services Comments (Updated March 2021):

Right of Way:

1. Fairview Street is a City of Burlington owned road. Fairview Street has a deemed road allowance width of 36m along the frontage of the subject lands. The actual road allowance width of Fairview Street appears to be at least 36m. No widening appears to be required; however, we defer to Planning to confirm ultimate ROW widths.
2. Oval Court is a City of Burlington owned road. Oval Court has a deemed road allowance width of 20m. The actual road allowance width of Oval Court appears to be 20m and the radius of the existing cul de

sac appears to exceed the City's minimum radius of 16m. No widening appears to be required; however, we defer to Planning to confirm ultimate ROW widths.

3. The City of Burlington's Capital Budget and Forecast indicates the following projects near to the subject lands:
    a. In 2026, Fairview Street (west of Appleby Line) is scheduled for resurfacing; and
    b. In 2027, Appleby Line (south of Fairview Street) is scheduled for reconstruction.

General Comments:

1. Please pre-consult with Burlington Hydro regarding their servicing requirements, as all hydro servicing is to be buried.
2. Please pre-consult with Union Gas, regarding their servicing requirements.
3. Please consider the locations of existing street trees, utility boxes and poles, and street lights when proposing driveway entrances.
4. Please consider pedestrian movements in any underground and at-grade parking areas. Please ensure there are delineated areas for pedestrians to safely enter/exist any elevator and/or stairwell. These areas should be clear of the vehicle travel lanes.
5. Please contact the City's Accessibility Coordinator, Judi Lytle (judi.lytle@burlington.ca), to confirm the required number, type and location of barrier-free parking spaces and any other accessible features that should be considered as part of the site.
6. Please be advised that precondition surveys of surrounding buildings may be required prior to the start of any construction related works and vibration monitoring may be required for the duration of construction. If necessary, these requirements and the related details will be addressed as part of the site plan application.

Environmental:

1. **Phase One and Phase Two Environmental Site Assessments (ESA) are required to make the application complete.** The ESAs shall be completed in accordance with O.Reg. 153/04, as amended. If the Phase One and/or Phase Two ESA indicate remedial site works are required, then a remediation plan shall be included with the submission to make it complete. All reports shall be accompanied by a letter of reliance that confirms the City and Region may rely upon the ESA information. Please be advised that if the reports are not completed in accordance with O. Reg. 153/04, as amended, the application will be deemed incomplete.
2. Please refer to the accompanying checklist for further details.

Geotechnical:

1. **A Geotechnical Investigation is required to make the application complete.** The Geotechnical Investigation shall:
    a. Assess groundwater and any concerns that may require special consideration, including but not limited to foundation drainage and/or underground stormwater storage. It is recommended that groundwater monitoring wells be installed (if necessary) as soon as possible so that readings can be taken in all seasons and detailed in the geotechnical report. If temporary and/or permanent groundwater dewatering is expected, it will be necessary to provide for a quantity estimate and quality analysis.
        - Any quantity estimate should indicate if a Permit To Take Water from the MECP will be necessary. Additionally, any pumping to the municipal storm sewer shall not exceed the allowable post-construction site discharge rate.

- Any quality analysis shall verify whether the groundwater condition satisfies the City's Storm Sewer Discharge By-law requirements. Please note the by-law is under review, so please contact Jeff McIsaac (jeff.mcisaac@burlington.ca) for an updated list of discharge parameters.

b. Assess any existing retaining walls/slopes and confirm the impact from the proposed construction works and/or provide recommendations for how best to resolve grade differences with adjacent properties.
c. Assess soil conditions, as they relate to any proposed Low Impact Development techniques, including but not limited to infiltration galleries and bioretention swales.
d. Assess and provide recommendations for scope of precondition surveys and vibration monitoring for surrounding buildings, if necessary, which are to be completed prior to the start of any construction related works and may be required for the duration of construction. As noted above, if necessary, these requirements and the related details will be addressed as part of the site plan application.

2. If a hydrogeology consultant is necessary, staff request that the geotechnical consultant provide direction on further and/or more detailed studies to ensure the City's concerns are addressed.
3. Please refer to the accompanying checklist for further details.

***Construction and Mobility Management*:**

1. **A Construction and Mobility Management Plan (CMMP) is required to make the application complete.** A detailed CCMP, that is completed in accordance with the City's Construction and Mobility Management Policy, is required to ensure that the construction works can be completed in a manner that is to the satisfaction of the Director of Engineering Services and the Director of Transportation Services. Use of the City's road allowance for construction staging, etc. has not been approved. To assess the impact of construction works on residents, vehicles, pedestrians and local businesses, the CMMP is to provide for the required information, including but not limited to:
    a. CMMP that is plotted to scale on 24" x 36" sheet
    b. Proposed limits of construction
    c. Proposed construction staging areas, including any staging areas required on the City's road allowance for concrete pours, material deliveries, site servicing, etc. and written justification for any construction staging areas on the City's road allowance
    d. Proposed temporary/permanent encroachments on the City's road allowance and written justification of any required encroachment on the City's road allowance
    e. Proposed truck haulage routes and location of truck stacking
    f. Proposed location of mud mat and vehicle wash down area
    g. Proposed location of crane assembly and swing radius
    h. Proposed traffic control measures, specifically addressing signage and/or any lane closures/restrictions
    i. Pedestrian control measures, specifically addressing signage and pedestrian routing
    j. Construction phasing plans with a separate plan providing for the details of each construction phase (i.e. earthworks and foundation excavation, servicing, surface concrete and asphalt works, building construction, landscaping)
    k. Cross sections for the foundation/basement (minimum of one per foundation wall) providing for adjacent property lines and offset dimensioning, including for the City's road allowance, and detailing excavation shoring, tiebacks, rock anchors, foundation walls, foundation drainage, etc.

2. Please refer to the accompanying checklist for further details.

Noise and Vibration Feasibility Study:

1. **A Noise and Vibration Feasibility Study is required to make the application complete.** The Noise and Vibration Feasibility Study shall be completed in accordance with MECP's Environmental Noise Guideline (Publication NPC-300).

   The Noise and Vibration Feasibility Study shall also consider and provide comment on the following:
   a. Classification of the property – Class 1, as per NPC-300
   b. Impact of environmental noise on the proposed development, i.e. identify adjacent existing (or future, if feasible) mechanical equipment and stationary sources that may impact the proposed development. If mitigation is necessary, provide recommendations for mitigation.

      Please be advised that although NPC-300 indicate 60dBA in an OLA (both at ground and upper levels) with warning clauses may be acceptable, the City will require that all possible measures be taken to control the noise in the OLA to 55dBA or less and only if not feasible will exceedance be considered. Please provided calculations for any exceedance that confirm the necessary mitigation to achieve each dBA that is greater than 55dBA, i.e. 60dBA requires a 3m noise barrier, 59dBA requires a 3.5m noise barrier, 58dBA requires a 4.0m noise barrier, etc.

      Please also be advised that although NPC-300 indicates private terraces/balconies less than 4.0m deep do not require mitigation, if private terraces/balconies are proposed then the City will require a warning clause which speaks to the following: "*Purchasers/tenants are advised that the private terraces of each unit are less than 4.0m deep and therefore are not required to have noise mitigation measures installed, as per Ministry of the Environment, Climate and Park guidelines. Sound levels due to road/train traffic may interfere with some private terrace/balcony activities."*

   c. Impact of the proposed development on neighboring noise sensitive receptors and spaces
   d. Impact of the proposed development on proposed development's noise sensitive receptors and spaces
   e. Impact of construction related vibration on neighboring dwellings/structures. Please be advised that precondition surveys of surrounding buildings may be required (with other landowner's consent) prior to commencing construction works and as a condition of Draft Site Plan Approval. Furthermore, vibration monitoring may be required for the duration of construction as a condition of Draft Site Plan Approval. The detailed limits of the precondition surveys and vibration monitoring would be confirmed by a Professional Engineer specializing in vibration as a condition of Draft Site Plan Approval. The Geotechnical Engineer may need to be consulted in this regard. We would ask that the consultant advise at this stage the (estimated) study limits.
   f. For any proposed off-site mitigation, written confirmation from other landowner(s) of their agreement to allow for and maintain mitigating measures will be required for the application to be completed. Further, confirmation of a formal agreement may be required.
   g. Impact of vibration on the proposed development from any railway lines within 500m of the site.
   h. Copy of the concept site plan to be included in the report to ensure the study is based on an up to date Site Plan design.

i. Study to use roadway capacity volumes or volumes provided by the City Transportation Services Department for any STAMSON (or other model) calculations. A copy of the related correspondence is to be appended to the study.
j. Study shall provide for appended copies of correspondence from any other City departments and any other vested agency, including but not limited to GO/Metrolinx, for traffic/train counts, as necessary.
k. All STAMSON (or other model) calculations are to be appended to the study.
l. Details of any recommended mitigation is to be included in the report, i.e. window glazing, façade requirements, etc.
m. Actual noise measurements to be included in the report, if necessary
n. Key plan of site and surrounding area, as necessary, to show the location of any points of reception
o. A minimum of one receptor for each floor of each side of each building is required as well as for each outdoor living areas. Receptors for surrounding residential is also required.
p. A table clearly outlining each receptor ID and the allowable noise level, unmitigated noise level and mitigated noise level for each ID is required.
q. A sketch providing for the location and details of any recommended mitigation is required.

2. Please refer to the accompanying checklist for further details.

Stormwater Management:

1. **A Stormwater Management (SWM) Report is required to make the application complete.** Please be advised that City of Burlington adopted new Stormwater Management Design Guidelines with new IDF curves in June 2020: https://www.burlington.ca/en/services-for-you/Stormwater.asp.

   The SWM report shall satisfy the criteria provided by the City's Stormwater Engineer. Please be advised that Conservation Halton and the MTO may provide criteria as well and if so the most stringent criteria shall apply.

   Please be advised that rooftop storage will not be credited towards the site's quantity control unless the requirements as outlined in the Stormwater Management Design Guidelines are met. Rainwater harvesting is however permitted for other purposes, including but not limited to grey water collection for flushing of toilets, irrigation for landscaping, etc.

   Please be advised that if a basement or underground parking structure is proposed then groundwater must be assessed, and any long-term dewatering must be identified, quantified and incorporated into the stormwater management design of the site. Any short-term construction dewatering and/or long-term dewatering require preliminary estimates for pumping and management purposes. Details of any groundwater collection system and/or foundation drainage system are to be provided. If groundwater is to be discharged from the site by way of the City's storm sewer then confirmation that the groundwater quality satisfies the requirements of the City's discharge criteria will also be necessary.

   The SWM Report shall also consider and provide comment on the following:
   a. Existing drainage patterns and infrastructure, including but not limited to surface grading, is to be discussed and maintained, if feasible.
   b. Stormwater storage, including but not limited to locations and details, is to be discussed.
   c. Full size/scalable, signed/stamped pre-development, post-development, site servicing and site grading plans are to be appended. Please ensure any regulated areas, spill areas and any related elevations are clearly identified and labeled on the drawings.
   d. Quantity control is to be regulated by way of an orifice tube, not a plate.

e. Capacity of receiving stormwater system is to be confirmed.
f. Integrity of receiving stormwater system is to be confirmed. A pre and post construction video inspection will be required for any site service connection and surrounding City storm sewer.
g. Control structures and their locations are to be detailed by way of cross sections.
h. Storm sewer design calculation are to be appended. Please be advised that the 5-year design storm shall be controlled and contained underground and with no surface ponding.
i. Low Impact Development stormwater management techniques, in accordance with the Credit Valley Conservation Authority and Toronto Region Conservation Authority guidelines or any MECP guidelines, are encouraged.

2. Please refer to the accompanying checklist for further details.

Detailed Engineering Drawings:

1. **Detailed engineering drawings are required to make the application complete.** All engineering drawings are to be coordinated and use the same base layering as all other disciplines. Please reference:
   - The Site Plan Guidelines: (https://www.burlington.ca/en/services-for-you/resources/Planning_and_Development/development_Applications/SitePlanGuidelinesason-2014-nc.pdf); and
   - The Engineering Services Standard Drawings: (https://www.burlington.ca/en/modules/document/document.aspx?param=2Z3nvEAH3UVGGP5lA5HbUqeKsQeQuAleQuAl)
2. For all drawings, please ensure enough site area for exterior lighting poles, utility meters, pedestals, transformers, etc. Utilities for private developments are to be located on private lands and to the satisfaction of the related agency.
3. For Site Servicing Plan:
   a. Site Engineering defers to the Region of Halton and the City's Building Department (for OBC) to comment on potable water and waste water servicing
   b. Storm sewers cannot be located under buildings
   c. Show all existing and proposed servicing and indicate what is to happen to existing servicing (i.e. reuse, remove, abandon). If existing servicing is to be reused, the infrastructure's condition will need to be inspected and certified by the Professional Engineer.
   d. Show all information for maintenance holes, catchbasins, etc. and sewers, including but not limited to OPSD, pipe slope, material, length, inverts, crossings and separations, etc.
   e. Provide for a detail of each referenced specification. A separate Details and Notes plan may be required.
   f. Daylighting of buried infrastructure is required to confirm actual elevations. Engineering drawings must contain accurate locations and inverts for connections and crossings to ensure the proposed site design is feasible. Prior to commencing any daylighting (or any other works) on the City's road allowance, please contact Engineering Services to obtain a Permit for Construction on Private Property.
4. For Site Grading Plan:
   a. Provide for the following for all buildings:
      - Underside of footing elevation (UFE)
      - Underside of basement floor elevation (UBF)
      - Finished floor elevation (FFE)
      - Top of foundation wall elevation (TFW)
      - Openings in foundation
   b. Show top and bottom of curb elevations and curb depressions
   c. Show accessible ramps
   d. Show pavement and finished ground elevations and drainage directions with gradients
   e. Show surface ponding limits and elevations for 100-year design storm
   f. Provide for top and bottom of retaining wall elevations for both proposed and existing walls
   g. Provide for major overland flow routes

h. Show proposed fencing
i. Provide for finished ground elevations on adjacent properties, enough to determine existing drainage patterns.

Please be advised that surface ponding in accessible parking spaces will not be supported.

5. For Excavation Shoring System Details:
   a. All elements of the underground parking structure, including but not limited to any excavation shoring wall, shoring pile locations, tie-back extents, etc, are required to be located within the limits of the subject property. In order to assess the feasibility of the proposed development the engineering details of the underground parking structure will be required.
   b. Drawings, sections, etc. related to the excavation shoring system are to be stamped and certified by a Professional Engineer.
6. Please refer to the accompanying checklist for further details.

For additional information and/or clarification of City of Burlington Engineering Services comments, please contact Jeff McIsaac at jeff.mcisaac@burlington.ca.

Urban Forestry & Landscape Comments (Updated March 2021):

Re: Existing Trees

1. A Tree Preservation Plan and Arborist Report are required for all existing trees greater than 10cm DBH on site and on adjacent properties within 3m of the property lines, and trees of any size on city property. See the City of Burlington: Pre-Submission Checklist for requirements.
2. Any existing trees on the subject site should be considered for preservation. Trees that are injured or removed under the provisions of a private tree permit will need to be replaced using the City's method of calculation. The tree's size, as well as the overall condition rating will impact the total number of cm's required to be replaced. Generally, one replacement tree is required for every 10 cm diameter removed. It is recommended that the replacement trees are replanted on the subject site. If there is no room on site for the replacement trees, there will be a charge of $400 per replacement tree. This information and calculations should be included in the submitted Arborist Report and Tree Preservation Plan.
3. Removal or damage to trees on neighboring properties within 3.0m of the property line and boundary trees (which are protected under the Provincial Forestry Act (RSO 1990) Section 10) will require:

   - The adjacent property owners shall be consulted and made aware of the proposed development and potential impacts to their trees and boundary trees and requested to submit in writing that there are no concerns with proposed treatment of the existing trees.

   OR

   - A qualified professional (as defined in Pre-Submission Checklist) shall be retained to address the potential impacts on the neighbor's trees and/or boundary trees and provide a letter or report confirming in their opinion regarding impacts to the boundary trees from proposed construction. The arborist letter or report shall also include the preservation methods, including pruning and fertilizing, that can be implemented by the owner to ensure the health of trees on neighboring properties.

4. **If** trees on private property are proposed to be removed prior to Site Plan approval, a Tree Permit is required for removal or injury of trees on private property within the Urban Planning Area Boundary of the City of Burlington, in accordance with the Private Tree Bylaw 20-2020, including the payment of the Tree Permit fee and compensation for trees required to be removed. A Private Tree Permit

application should be applied for through the online application system: https://webforms.burlington.ca/Roads-and-Parks-Maintenance/Private-Tree-Permit-Application.

5. There are city trees in the right-of-way along Fairview Street, and trees in Sherwood Forest Park and in the naturalized area along Appleby Creek, west of the site, that are considered city trees. Removal of city trees will require council approval. Removal of city trees should be avoided where possible, and proposal for removal will require an arborist's assessment of health and structural condition prior to the request being accepted. Additionally, alternate layouts and construction measures should be considered to preserve healthy city trees and discussed in the Arborist's Report, and in the absence of alternatives, justification provided for any requested removals.
6. A Tree Permit is required for any and all works around city trees, in accordance with Public Tree Bylaw 68-2013, including the payment of the Tree Permit fee and securities for trees to be retained. The details of the Tree Permit will be finalized at the Site Plan stage.
7. All existing public and private trees to be retained require tree protection fencing. Please see the City of Burlington Tree Preservation and Protection Specification SS12A for further tree protection details. Minimum Tree Protection Zones (MTPZ) and Critical Root Zones (CRZ) should be clearly shown and labeled on the Tree Inventory and Preservation Plan, in addition to tree protection fencing. Any encroachments into the MTPZ of existing trees to retain should be discussed in the Arborist Report.
8. Show existing trees to be preserved and tree preservation fencing on the Construction Management and Mobility Plan.
9. A qualified professional (as defined in the City of Burlington's Pre-submission Checklist) may be required to be retained to address potential impact on the existing trees on site and boundary trees during excavation operations to ensure no damage to the protected trees or their root systems. Requirement to be determined at the Site Plan stage.
10. **Do not remove any trees from the site until after the Zoning and Official Plan Amendment applications have been approved.**

Re: Landscape

1. A Landscape Concept Plan will be required, showing general layout and intent of what is proposed for landscape buffer and area plantings, outdoor amenity areas, along the pedestrian promenade, fence location and types and pedestrian circulation. See the Pre-Submission Checklist for requirements.
2. Any recommendations or issues of compatibility (e.g. noise, light, uncomfortable wind conditions) noted in the Planning Justification Report, Noise Report and Wind Study should be addressed and reflected on the Landscape Concept Plan, for example with buffer planting, screens and fencing, trellises or awnings for outdoor areas including pedestrian walkways and amenity areas.
3. Clearly show the limits of the underground parking on the Landscape Concept Plan and ensure there is sufficient soil volume for full sized large canopy trees.
    a. Minimum required soil volumes range from $15m^3$ to $30m^3$, depending on the tree species and planting layout (e.g. soil volume share in a continuous trench for multiple trees, use of structural soil cells or engineered structural soil.)
    b. The draft City Tree Planting Guidelines specify $30m^3$ of soil per tree in a single tree pit, $15m^3$ per tree in a shared planting environment. Excavation for each planting environment should be 0.75m to 1.2m depth and should not exceed 1.5m depth. Smaller rooting volume (minimum $15\text{-}20m^3$) may be proposed for smaller trees.
    c. Enough space between the property lines and the limit of underground parking should be provided to grow large canopy trees that will not need to be removed when the underground parking garage requires repairs (i.e. trees planted on the roof slab of the underground parking garage).

4. Once the number of parking spaces is finalized, confirm the required number of Type "A" and Type "B" barrier free parking spaces required. Type "A" shall be 3400 mm in width and signed to indicate Van Accessible Parking. Type "B" shall be 2750 mm as per city zoning by-law. As per city zoning by-law, the access aisle shall be 2000 mm. The access aisle is to be clearly identified and can be shared by both spaces. Please see GAATES Figure 2.6.4.1 (page 127) for Van Accessible Signage detail.

   Locate the barrier free parking spaces closest to the elevator lobby and not crossing vehicular traffic in the underground parking garage.

   Contact the city's Accessibility Coordinator if you have any questions: Judi Lytle, 905-335-7600, ext. 7865, judi.lytle@burlington.ca.
5. Show bicycle parking and snow storage locations.
6. Show and dimension pedestrian walkways and connections to the city sidewalk (1500mm minimum width, 1800mm recommended) and the city sidewalk across the Ironstone Drive frontage. Consider the width of the pedestrian walkways minus the doors that open out to ensure pedestrians don't need to walk on vehicular driveways.
7. Consider pedestrian safety and accessibility along the pedestrian walkways, including lighting and seating areas.
8. Show the location of air vents/shafts.
9. Show conceptually the proposed layout and use of outdoor amenity areas.

For additional information and/or clarification of Urban Forestry & Landscape comments, please contact Tania Dowhaniuk at tania.dowhaniuk@burlington.ca.

Parks Design & Construction Comments:

Park Dedication Comments

- Park dedication will be a requirement of this development
- Park dedication will be calculated in accordance with the current City Park Dedication Policies and By-law. Recently Bill 197 was introduced by the Province reestablishing the alternative rates for calculating parkland dedication, cash in lieu of parkland dedication and situations where parkland dedication and Cash in lieu of parkland dedication are combined.
- If the development is to proceed in advance of the completion of the Area Specific Plan, parkland dedication to establish a public park as an expansion of Sherwood Forest Park may be required as a condition of this development
- Public parkland will be free of encumbrances such as parking garages, utilities and roadways and will face a public road.
- Private owned, publicly accessible open space (POPS) can enhance the publicly owned open space network, however isn't considered a replacement to parkland dedication. The City is willing to discuss the use of POPS for this development as required.
- The Oval Court Master Plan dated December 4, 2020 proposes a portion of the Courtyard Mews and a play equipment in Sherwood Forest Park.
    - Sherwood Forest Park has a play structures in both the west and east sections of the park. If the applicant believes a play structure is required, it should be located within the limits of the development.
    - The city supports the development of open space gathering areas, however the master plan should demonstrate how the Courtyard Mews is located within the limits of the development.
    - A transition from the development into the park is supported. The design of this transition should be coordinated in consultation with Marion Rabeau, Senior Landscape Architect and Project Manager for the Sherwood renewal Project

- Interest from the community to establish a pedestrian /cycling connection to the GO station through park and this development. The applicant with work with the city's project manager to consider this connection.
- Please provide greater detail of the effects of winds on the sport field to the east of the development.
- All privately owned publicly accessible open space will require an agreement with the City to ensure uninterrupted access.
- All privately own publicly accessible spaces will be constructed to adhere to the City of Burlington Accessibility Standards
- The City will require the hazard lands as defined by Conservation Halton be conveyed to the City as identified in Official Plan Policies.
- The City supports the master plans efforts to create an enhanced public realm as part of the inner streets and courtyard mews

For additional information and/or clarification of Parks Design & Construction comments, please contact Rob Peachey at rob.peachey@burlington.ca.

Transportation Services Comments (Updated March 2021):

- Please refer to our Burlington Citywide Parking Standards Review for applicable parking rates for this proposal. Lower parking rates will not be supported by Transportation Planning staff - see the following URL https://www.burlington.ca/en/services-for-you/city-wide-parking-standards-review.asp Note: The parking rates for residential land uses were appealed to the Local Planning Appeals Tribunal (LPAT) and are therefore not yet in force and effect. Required rates are reflected in the Zoning By-law and a variance will be required.
- Please refer to our Site Plan Guidelines for applicable design standards for structured parking and ground floor
- Transportation Planning staff will review the Traffic Impact Study and provide feedback.
- Please provide truck turning templates to demonstrate the functionality of the accesses, loading spaces and underground parking.
- Note: This is a development that falls within the QEW Prosperity Corridor Study Area. The developer can speak to Kaylan Edgcumbe about this study
- As part of the submission, we will require a Construction Management Plan. For construction, staff will not support temporary closure of vehicle lanes, bike lanes, boulevards, sidewalks, etc.

For additional information and/or clarification of Transportation Services comments, please contact Danijel Ozimkovic at danijel.ozimkovic@burlington.ca.

CN Rail Comments:

The subject site is located adjacent to a CN Main Line. It should be noted that CN has concerns of developing/densifying sensitive uses abutting our railway right-of-way. This is due to noise, vibration and potential trespass issues that will result. Development of sensitive uses in proximity to railway operations cultivates an environment in which land use incompatibility issues are exacerbated. CN's guidelines reinforce the safety and well-being of any existing and future occupants of the area.

It appears that the proposed development does meet the minimum required setback of 30 meters (conceptual site plan, 04-12-2020). Non-sensitive uses such as parking spaces, snow storage etc. can be located within the required setback, however any sensitive uses must be located a minimum of 30 meters from the railway corridor (measured from the CN property line). CN urges the municipality to pursue the implementation of the following criteria as conditions of a project approval:

- Safety setback of habitable buildings from the railway rights-of-way to be a minimum of 30 metres in conjunction with a safety berm. The safety berm shall be adjoining and parallel to the railway rights-of-way with returns at the ends, 2.5 metres above grade at the property line, with side slopes not steeper than 2.5 to 1.

- The Owner shall engage a consultant to undertake an analysis of noise. At a minimum, a noise attenuation barrier shall be adjoining and parallel to the railway rights-of-way, having returns at the ends, and a minimum total height of 5.5 metres above top-of-rail. Acoustic fence to be constructed without openings and of a durable material weighing not less than 20 kg. per square metre of surface area. Subject to the review of the noise report, the Railway may consider other measures recommended by an approved Noise Consultant.
- Ground-borne vibration transmission to be evaluated in a report through site testing to determine if dwellings within 75 metres of the railway rights-of-way will be impacted by vibration conditions in excess of 0.14 mm/sec RMS between 4 Hz and 200 Hz. The monitoring system should be capable of measuring frequencies between 4 Hz and 200 Hz, ±3 dB with an RMS averaging time constant 1 second. If in excess, isolation measures will be required to ensure living areas do not exceed 0.14 mm/sec RMS on and above the first floor of the building.
- The Owner shall install and maintain a chain link fence of minimum 1.83 metre height along the mutual property line.
- Any proposed alterations to the existing drainage pattern affecting railway property must receive prior concurrence from the Railway and be substantiated by a drainage report to the satisfaction of the Railway.

CN would like to have the opportunity to review the:

- plan, cross section and specifications of the proposed safety berm,
- noise study and mitigation measures,
- vibration study and mitigation measures,
- plan illustrating the location of the safety fence,
- SWM report,

Please, take note that in the event of the proposal moving forward, CN will be seeking to enter into a development agreement with the owner, the registration of an environmental easement on title, as well as a warning clause.

For additional information and/or clarification of CN Rail comments, please contact Ashkan Matlabi at ashkan.matlabi@cn.ca.

Metrolinx Comments:

Thank you for circulating the pre-submission consultation application to Metrolinx for review. I understand the applicant is contemplating a mixed-use community consisting of multiple towers ranging in heights from 11-storeys to 30-storeys, park space, retail and office uses, and daycare facilities. I note the subject lands (720, 735, and 740 Oval Court and 5135, 5155 Fairview Street) are located immediately adjacent to Metrolinx's Oakville Subdivision, which carries GO Transit ridership on the Lakeshore West Line. My comments on the subject application are noted below:

1. Metrolinx's Adjacent Development Guidelines requires sensitive (residential) uses to be set back a minimum of 30 metres from the railway right-of-way. I note the Conceptual Site Plan demonstrates this setback. I have no further comment in this regard.

2. Per Metrolinx's Adjacent Development Guidelines, the aforementioned horizontal setback is required in conjunction with a 2.5 metre high safety berm, measured from grade at the property line, with side slopes not exceeding 2.5:1 located at the intervening space between the development and the railway right-of-way. In the event that a safety berm of this configuration cannot be achieved on site, a safety barrier (e.g. crash wall) providing equivalent derailment protection may be considered. Note that the safety barrier design must undergo technical review by Metrolinx's Technical Advisor, AECOM.

3. The applicant is required to submit a noise and vibration study, prepared by a qualified professional, to determine whether the proposed development will be impacted by noise and vibration levels which exceed MECP guidelines. Should this be the case, the proponent should incorporate appropriate mitigation measures. The proponent may obtain Metrolinx's most up to date rail forecast by submitting a request to raildatarequests@metrolinx.com.

4. Generally speaking, Metrolinx is supportive of the introduction of new connections to GO stations, particularly the type currently proposed which provides a direct connection. I request the applicant provide additional information on the proposed connection, including how the connection meets Metrolinx's Third Party Entrance Connection Requirements. In addition, I request further information regarding the ownership of the ravine lands on which the bridge to Appleby GO Station is being contemplated.

5. The applicant is required to submit a stormwater management report demonstrating that any grading changes on the subject lands will not impact Metrolinx property (rail corridor).

6. In order to prevent unauthorized access to the neighbouring rail corridor, fencing must be provided along the boundary line. The current standard is a 2.43 metre high, non-cutable, non-climbable, high-security fence.

7. In accordance with Section 3.9 of the Federation of Canadian Municipalities and Railway Association of Canada's Guidelines for New Development in Proximity to Railway Operations, the Owner shall grant Metrolinx an environmental easement for operational emissions, which is to be registered on title. I have included a copy of the form of easement for the applicant's information.

8. As part of Metrolinx's GO Expansion program, a vegetation clearance zone has been established along the railway right-of-way. This zone extends 7 metres from the centreline of the outermost track. Within this area, tall growing vegetation (like trees) are not allowed. Some low-lying vegetation, such as decorative grasses or shrubs, may be accommodated. More information on this program can be found on the Metrolinx Engage website, found here.

For additional information and/or clarification of Metrolinx comments, please contact Tony To at tony.to@metrolinx.com.

Attachment C

January 28, 2020

Ms. Emma DeFields
Conservation Halton
2596 Britannia Road West
Burlington, ON
L7P 0G3

Dear Ms. DeFields:

Re: Terms of Reference – Scoped EER/EIA
Oval Court
City of Burlington

Further to your email to Beacon Environmental dated December 18, 2019 and our phone conversation on January 13, 2020, the EER/EIA Study Team noted that in the last round of commenting on the EER/EIA Terms of Reference, Conservation Halton (CH) staff included a new comment that relates to application of a 30 metre development setback from the bankfull channel of Appleby Creek on the basis of this creek reach being classified as a warmwater sportfish watercourse. From our phone conversation, it was clarified that this 30 m development setback is not a ***requirement*** pursuant to CH's Ontario Regulation 162/06 and associated CH policies but is rather a ***recommendation*** pursuant to CH's MOU with the Region.

While we appreciate the clarification, it has been our experience on other files in urban areas in Halton that such recommendations eventually become expectations, and if not met, can become difficult to resolve further into the planning and design process. As was expressed during our phone conversation, the EER/EIA Study Team and proponent are of the opinion that the recommended 30 m development setback to Appleby Creek is unwarranted from a scientific perspective and its application to this site would have the effect of sterilizing otherwise unconstrained lands from potential future redevelopment. Given the extent to which this recommendation would affect the proposed redevelopment, we do not consider it premature to raise this concern at this time.

We are also of the opinion that even in the absence of a completed EER/EIA, there is sufficient information currently available to allow CH to exercise its discretion with respect to applicability of this recommendation in this highly urbanized area. The Appleby Creek valleyland is only 20 - 25 m wide adjacent to the site and the application of a 30 m development setback would be highly disproportionate, particularly for an infill development of an existing fully developed site within an urban area. Furthermore, this setback has not been previously applied to any developments along Appleby Creek in the urban area of the City.

In support of this request for reconsideration, we offer the following additional rationale.

[p] 289.442.2829 [w] jlplanning.ca [e] jennifer@jlplanning.ca
8 Fieldgate Street Dundas ON L9H 6M6

Policy Rationale for Vegetated Buffers to Fish Habitat

Although CH has confirmed that this recommendation has not been made pursuant to Ontario Regulation 162/06, Policy 3.6 (Riparian Buffers and Fish Habitat) within CH's *Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document* (dated revised February 25, 2016) outlines the rationale for providing vegetated buffers to fish habitat which is helpful to reference.

Specifically, this policy notes that *changes to riparian vegetation can alter watercourse temperatures and that the introduction of sediment, pesticides or other deleterious substances degrades water quality*. The policy further states that a *vegetated buffer adjacent to watercourses can assist in removing some of these substances prior to entering the watercourse and that the provision of adequate vegetated buffers is essential to the maintenance and enhancement of fish habitat* (emphasis added).

The EER/EIA Study Team agrees with the rationale for riparian buffers stated in the policy and would like to clarify that:

a) the proposed redevelopment does not propose to alter the existing riparian vegetation and would capitalize on opportunities to improve and enhance the condition of riparian vegetation by replacing non-native invasive vegetation with native vegetation that is more beneficial to the fish community; and
b) the proposed development will implement 7.5 m landscaped valleyland buffers, enhanced stormwater management measures, and erosion control measures which will have the combined effect of improving water quality over the current condition.

The Appleby Creek valley and its riparian zone is already well vegetated. Under the proposed redevelopment, an additional 7.5 m vegetated buffer from the greatest hazard will need to be provided. This automatically ensures that the riparian buffer vegetation, under a redevelopment scenario, will be greater than the existing conditions. As a result, it is anticipated that the proposed re-development will not result in any increases to water temperature related to riparian vegetation as the vegetation will increase post-development.

Sediment, pesticides and other deleterious substances will similarly be handled through the provision of erosion and sediment controls during construction and the provision of on-site stormwater management measures post-development. The Oval Court drainage area currently has little to no stormwater quality controls in place. It is likely that the newer developments within Oval Court may have quality control measures in place (such as an Oil Grit Separator), but the majority of the site does not. Any re-development would result in an improvement to water quality through the provision of on-site quality and quantity controls. Finally, the policy notes that the provision of a vegetated buffer can assist in removing sediment prior to it entering the watercourse. While this is true within agricultural settings, given the stormwater management requirements that will be placed on any re-development, the only water that will be directed to the creek un-attenuated/un-treated will be that which falls directly on the creek block. As such, the provision of a 30 m vegetative buffer would not provide any greater removal of sediment than would a lesser buffer given the re-development stormwater requirements.

Recent field work completed by the EER/EIA Study Team has confirmed that this reach of Appleby Creek supports a coolwater fishery and a population of rainbow trout. We understand that CH has a similar setback policy that applies to coolwater streams. These recent findings suggest that a healthy fishery can be sustained in the absence of the recommended 30 m development setback and that there are other factors that contribute to water quality improvement and habitat enhancement.

For the reasons stated above, the EER/EIA Study Team is of the opinion that the policy objectives can be achieved without a 30 m development setback.

Natural Heritage Reference Manual

Table 11-3 of the Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005, 2nd Edition (NHRM) (MNRF, March 18, 2010) includes a ***recommendation*** for a 30 m to 15 m area of natural vegetated cover adjacent to warmwater streams. The table notes that the reduced 15 m area of natural vegetated cover is applicable if it has been demonstrated to satisfy PPS Policy 2.1.6. Policy 2.1.6 of the 2005 PPS states the following:

> *Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.3, 2.1.4 and 2.1.5 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.*

The Appleby Creek is a highly altered system from its headwaters to Lake Ontario. In many locations the creek has been realigned into a straight channel with no natural channel design and limited setbacks between the bankfull channel and the property line. In other areas, the creek is contained within private property with no lot line setbacks from the bankfull channel. The most recent developments in this watershed have generally taken place between Upper Middle Road and Highway 407. Given that these are the most recently developed greenfield areas, it is important to understand how/if the 30 m development setbacks for fish habitat were achieved in these areas. This is because greenfield development generally offers a greater ability to implement development setbacks as compared to re-development within existing urban areas.

South of Highway 407 and north of Dundas Street, within the Alton Village, the watercourse has been realigned with natural channel design however, in almost all instances, the distance from the bankfull channel to the property line is between 10 to 20 m. Between Dundas Street and Upper Middle Road, much of the creek has been realigned with natural channel design however, there are three on-line stormwater management ponds along the creek. In this reach, the development setback distance from bankfull channel to property line is in the range of 7 to 15 m. Given that 30 m setbacks were not achieved in the most recent greenfield development, it is respectfully submitted that it is not appropriate to recommend a 30 m development setback for a redevelopment within an existing urban area along this same watercourse.

Future Major Re-Development Potential along Appleby Creek

Other than the GO Mobility Hub Study Area, there are no other areas along Appleby Creek that are identified in the City's Official Plan for major re-development. As a result, the ability to obtain a 30 m development setback from the bankfull channel along Appleby Creek, north or south of Oval Court, is extremely limited. In fact, even obtaining a 30 m development setback on the west side of Appleby Creek, within the GO Station lands, would be extremely difficult given the resultant loss of parking and bus route that would occur.

Summary

Based on the above, the EER/EIA Study Team acknowledges the benefits of riparian buffers in supporting fish habitat and recommends that the EIA/EER is the most appropriate method for defining the most appropriate buffer. The impact of removing additional tableland from redevelopment potential must be weighed against the minimal benefit that would result from the provision of a 30 m vegetated buffer in this one isolated location along Appleby Creek. This is even more important when one considers the limited re-development potential that exists elsewhere along Appleby Creek, outside of the Mobility Hub, based on the City's Official Plan.

It is the EER/EIA Study Team's opinion that the provision of a more stable valley wall (as currently proposed by the owners along Oval Court), a 7.5m lot line setback from the greatest hazard, enhanced plantings within the valley and setback and removal of all development from within the Regional Storm floodplain, will be much more beneficial to the overall system than would a 30 m development setback in this one isolated location.

It is respectfully requested that CH reconsider the recommendation for a 30 m development setback from the bankfull channel and instead recommend that the EER/EIA fulfill Policy 2.1.8 of the 2014 PPS which states the following:

> *Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5 and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.*

By taking this approach, the current condition of the watercourse can be considered along with the benefits of additional riparian vegetation, stormwater management and site plan requirements in order to demonstrate no negative impacts on fish habitat.

We trust the above is of assistance. If you require additional information, please contact the undersigned.

Yours truly,

Jennifer Lawrence, MCIP, RPP
President

cc: Mr. Thomas Kastelic and Mr. Arden Semper, Branthaven
Mr. Glen Hansen, 5135 Fairview Holdings
Mr. Ken Ursic and Ms. Anna Corrigan, Beacon Environmental
Ms. Rosalind Minaji, City of Burlington

Anna Cunningham

From: Emma DeFields <edefields@hrca.on.ca>
Sent: March 27, 2020 11:34 AM
To: Jennifer Lawrence
Cc: Plas, Kyle; Huycke, Adam; Anna Cunningham; Ken Ursic; Thomas Kastelic; Pasquini, Alexsandria; Keliacius, Monika
Subject: RE: ToR for Revised Scoped EER/EIA for Oval Court, City of Burlington

Thanks Jennifer

From: Jennifer Lawrence <jennifer@jlplanning.ca>
Sent: March 27, 2020 11:31 AM
To: Emma DeFields <edefields@hrca.on.ca>
Cc: Plas, Kyle <Kyle.Plas@burlington.ca>; Huycke, Adam <Adam.Huycke@halton.ca>; 'Anna Corrigan' <acorrigan@beaconenviro.com>; Ken Ursic <kursic@beaconenviro.com>; Thomas Kastelic <tkastelic@branthaven.com>; Pasquini, Alexsandria <Alex.Pasquini@halton.ca>; Keliacius, Monika <Monika.Keliacius@halton.ca>
Subject: RE: ToR for Revised Scoped EER/EIA for Oval Court, City of Burlington

Hi Emma,

Thank you for your email and for the follow-up phone call this morning. The purpose of our phone call was just to make sure that I was absolutely clear on what your email was saying. Based on our conversation, you have confirmed that the EIA is the most appropriate mechanism to determine the buffer width and that CH is not requiring/recommending a specific buffer width (i.e., 30m). We will ensure that the report contains the documentation to appropriately classify this watercourse and propose a buffer that will assist in demonstrating no negative impact on fish habitat in accordance with current local, regional and provincial policies.

Take care,

Jennifer

From: Emma DeFields <edefields@hrca.on.ca>
Sent: Tuesday, March 17, 2020 3:36 PM
To: Jennifer Lawrence <jennifer@jlplanning.ca>
Cc: Plas, Kyle <Kyle.Plas@burlington.ca>; Huycke, Adam <Adam.Huycke@halton.ca>; 'Anna Corrigan' <acorrigan@beaconenviro.com>; Ken Ursic <kursic@beaconenviro.com>; Thomas Kastelic <tkastelic@branthaven.com>; Pasquini, Alexsandria <Alex.Pasquini@halton.ca>; Keliacius, Monika <Monika.Keliacius@halton.ca>
Subject: RE: ToR for Revised Scoped EER/EIA for Oval Court, City of Burlington

Good afternoon Jennifer,

Conservation Halton has reviewed the attached letter prepared by yourself and Beacon re: *Terms of Reference-Scoped EER/EIA* (Jan. 28, 2020) relating to fisheries setbacks. We have discussed with the City and Region and it is our opinion that the EER/EIA is the most appropriate mechanism to assess the presence of fish habitat and to determine appropriate buffers. The proponent will need to demonstrate that there will be no negative impact on fish habitat in accordance with current Local, Regional and Provincial Policies. CH will provide technical review and formal comments once the comprehensive studies are submitted.

Please feel free to give me a call with any further questions.

Regards,
Emma

Emma DeFields, MES
Environmental Planner

Conservation Halton
2596 Britannia Road West, Burlington, ON L7P 0G3
905.336.1158 ext. 2335 | Fax 905.336.6684 | edefields@hrca.on.ca
conservationhalton.ca

From: Jennifer Lawrence
Sent: Tuesday, January 28, 2020 9:56 AM
To: Emma DeFields <edefields@hrca.on.ca>; 'Anna Corrigan' <acorrigan@beaconenviro.com>
Cc: Ken Ursic <kursic@beaconenviro.com>; Andrew Eldebs <aeldebs@branthaven.com>; Pasquini, Alexsandria <Alex.Pasquini@halton.ca>; Keliacius, Monika <Monika.Keliacius@halton.ca>; 'Minaji, Rosalind' <Rosalind.Minaji@burlington.ca>; Huycke, Adam <Adam.Huycke@halton.ca>
Subject: RE: ToR for Revised Scoped EER/EIA for Oval Court, City of Burlington

Hi Emma,

Further to our phone conversation on January 13, please find attached a letter prepared by Beacon Environmental and I with respect to the recommendation for a 30 m development setback that was identified at the pre-consultation meeting on October 23 as well as in your email below related to the EER/EIA Terms of Reference. As outlined in the letter, we are requesting that CH reconsider the recommendation for a 30 m development setback. A hard copy of the letter will follow by mail to CH.

Thanks,

Jennifer

From: Emma DeFields <edefields@hrca.on.ca>
Sent: Wednesday, December 18, 2019 6:02 PM
To: 'Anna Corrigan' <acorrigan@beaconenviro.com>
Cc: Ken Ursic <kursic@beaconenviro.com>; Andrew Eldebs <aeldebs@branthaven.com>; Jennifer Lawrence <jennifer@jlplanning.ca>; Pasquini, Alexsandria <Alex.Pasquini@halton.ca>; Keliacius, Monika <Monika.Keliacius@halton.ca>; 'Minaji, Rosalind' <Rosalind.Minaji@burlington.ca>; Huycke, Adam <Adam.Huycke@halton.ca>
Subject: RE: ToR for Revised Scoped EER/EIA for Oval Court, City of Burlington

Hi Anna

We have now completed review of the revised ToR:

- *Revised Terms of Reference for Scoped Environmental Evaluation Report/Environmental Impact Assessment in Support of Redevelopment of 720, 735 & 740 Oval Court and 5135 and 5155 Fairview Street, City of Burlington, Ontario*, dated October 21, 2019

Thank you for incorporating Conservation Halton's (CH's) prior detailed comments. As noted through our preconsultation notes from Oct. 23, 2019, please be advised that a 30 m development setback from bankfull channel of Appleby Creek will apply as this is considered a warmwater sportfish watercourse.

While we have no further comments at this time, we again advise that the City-led studies (e.g. Mobility Hubs, Appleby Creek Flood and Erosion EAs) should provide direction regarding any major creek system modifications and may first be needed depending on the scale, scope and rationale for alterations proposed as part of a site-specific development application. Further to Adam's email below, CH may provide updated comments on the scope of work if additional details on the proposed development are provided, or if site specific analysis and development approval are sought in advance of the Region and City's comprehensive analysis being complete for this area.

Please feel free to contact me with any questions going forward.

Regards,
Emma

Emma DeFields, MES
Environmental Planner

Conservation Halton
2596 Britannia Road West, Burlington, ON L7P 0G3
905.336.1158 ext. 2335 | Fax 905.336.6684 | edefields@hrca.on.ca
conservationhalton.ca

From: Huycke, Adam <Adam.Huycke@halton.ca>
Sent: November 13, 2019 11:52 AM
To: 'Anna Corrigan' <acorrigan@beaconenviro.com>; 'Minaji, Rosalind' <Rosalind.Minaji@burlington.ca>
Cc: Ken Ursic <kursic@beaconenviro.com>; Andrew Eldebs <aeldebs@branthaven.com>; Emma DeFields <edefields@hrca.on.ca>; Jennifer Lawrence <jennifer@jlplanning.ca>; Pasquini, Alexsandria <Alex.Pasquini@halton.ca>; Keliacius, Monika <Monika.Keliacius@halton.ca>
Subject: RE: ToR for Revised Scoped EER/EIA for Oval Court, City of Burlington

Good Afternoon Anna:

Further to your October 21, 2019 submission on the Revised TofR for a Scoped EER/EIA for Oval Court, Regional Staff offer the following comments for your consideration:

- As provided in our October 17, 2019 comments on the first submission of the TofR for a Scoped EER/EIS for Oval Court, Regional Staff continue to be of the opinion that the completion of the comprehensive analysis of the natural heritage and natural hazard constraints associated with the Appleby GO Station *Major Transit Station Area* (MTSA) should be completed in advance of any site specific studies being initiated. To be clear, Regional Staff are of the opinion that should the site specific analysis and subsequent development approval be sought for the subject lands in advance of the completion of the Region's and City's comprehensive analysis, that it is the expectation of the Region that the study area for the scope of the TofR would be expanded beyond the study area referred to in Figure 1. Regional Staff therefore reserve the right to reconsider our comments of the Scope of Work for the EER/EIA depending upon the timing of the submission of the development applications currently being proposed.
- The introduction states that the proponent intends to redevelop the subject lands into a *transit-oriented community designed for residential, retail and commercial uses* however no development application or concept plan was provided within the TofR. While stating this Regional Staff note that approval of the City adopted Official Plan, designations and policies has not occurred to date. The TofR should be amended to reflect this.

- The TofR should be updated to state that the dripline of the woodlands will be staked, surveyed by the proponent, and that the Regional Forester will confirm the dripline, if not already completed. The dripline should be shown on all development plans.
- Regional Staff recommend that the applicant contact Ministry of Environment, Conservation and Parks (MECP) to assist in screening and assessing for all possible species at risk (SAR) on the property as the Region has records of SWH and SAR in proximity to the area. Any correspondence with MECP should be included within the study.

The above noted comments should be addressed in a revised Terms of Reference and circulated for review and approval to Regional, City and Conservation Authority staff.

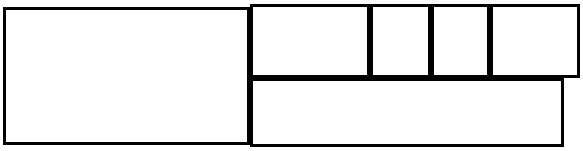
In the event that more details are provided about the proposed development, the Region reserves the right to update these comments as necessary.

Please let me know if you require anything further in this regard.

Sincerely,

Adam

Adam Huycke, MCIP, RPP, CPT
Senior Planner
Planning Services
Legislative & Planning Services
Halton Region
905-825-6000, ext. 7604 | 1-866-442-5866



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From: Anna Corrigan <acorrigan@beaconenviro.com>
Sent: Monday, October 21, 2019 4:52 PM
To: 'Minaji, Rosalind' <Rosalind.Minaji@burlington.ca>
Cc: Ken Ursic <kursic@beaconenviro.com>; Andrew Eldebs <aeldebs@branthaven.com>; Emma DeFields <edefields@hrca.on.ca>; Hudson, Brian <Brian.Hudson@halton.ca>; Huycke, Adam <Adam.Huycke@halton.ca>; Jennifer Lawrence <jennifer@jlplanning.ca>
Subject: ToR for Revised Scoped EER/EIA for Oval Court, City of Burlington

Good afternoon,

Please find attached the Revised ToR for Scoped EER/EIA for Oval Court, City of Burlington.

Regards,

Anna Corrigan, B.Sc.(Hons) / Ecologist
BEACON ENVIRONMENTAL
373 Woolwich Street, Guelph, ON N1H 3W4
T) 519.826.0419 x32 C) 905.767.1720
www.beaconenviro.com

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Appendix B

MECP Consultation Regarding *Endangered Species Act*

Anna Cunningham

From: Species at Risk (MECP) <SAROntario@ontario.ca>
Sent: Wednesday, January 8, 2020 10:32 AM
To: Anna Corrigan
Cc: Ken Ursic
Subject: RE: Oval Court EIA - SAR Screen
Attachments: DRAFT-Proponents Guide to Preliminary Screening-May 2019.pdf

Hello,

Please find attached our Draft Proponent's Guide to Preliminary Screening for Species at Risk.

Once the preliminary screening has been undertaken, please contact us (SAROntario@ontario.ca) with the results. A staff person will then be assigned to your request for review.

Please note that we are working through a significant backlog of submissions and requests, so it will take some time to process your request. Thank you for your patience.

Regards,

Permissions and Compliance
Species at Risk Branch

From: Anna Corrigan <acorrigan@beaconenviro.com>
Sent: October 17, 2019 11:57 AM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Cc: Ken Ursic <kursic@beaconenviro.com>
Subject: Oval Court EIA - SAR Screen

Good morning,

Beacon Environmental Limited (Beacon) was retained by Branthaven Development Corp. to prepare a Scoped Environmental Evaluation Report/Environmental Impact Assessment (EER/EIA) in support of a redevelopment proposal for properties located at 720, 735 and 740 Oval Court and 5135 and 5155 Fairview Street in the City of Burlington, herein referred to as the subject lands. The subject lands comprise 4.59 hectares of existing commercial and industrial development situated north of Fairview Street and south of the CN rail line immediately between Appleby Creek and Sherwood Park (please refer to the attached figure).

As part of the Terms of Reference process for this project, the Region of Halton and Conservation Halton have requested that MECP assist in screening and assessing for all possible species at risk (SAR) in the study area as the Region has records of SWH and SAR in proximity to the area.

Thank you in advance for any guidance you can provide,

Anna Corrigan, B.Sc.(Hons) / Ecologist
BEACON ENVIRONMENTAL
373 Woolwich Street, Guelph, ON N1H 3W4
T) 519.826.0419 x32 C) 905.767.1720
www.beaconenviro.com

Appendix C

Field Data Sheets

Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

Oval Court - Appleby Creek

Notes: Enter map notes



Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion

Wetland
- Provincially Significant Wetland Evaluated
- Non - Provincially Significant Wetland Evaluated
- Unevaluated Wetland

Area of Natural Heritage & Scientific Interest (ANSI)
- Provincially Significant Life Science ANSI
- Provincially Significant Earth Science ANSI

Greenbelt Plan
- Boundary
- River Valley Connections

Land Use Designations
- Protected Countryside
- Towns and Villages
- Hamlets
- Urban River Valley
- Specialty Crop Area

Niagara Escarpment Plan (NEP)
- Boundary
- Parks and Open Space System

Land Use Designations
- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Escarpment Recreation Area
- Urban Area
- Minor Urban Centre

Oak Ridges Moraine Conservation Plan (ORM)
- Boundary

Land Use Designations
- Natural Core Area
- Natural Linkage Area
- Countryside Area
- Rural Settlement
- Palgrave Estates Residential Community
- Settlement Area

0.1 0 0.04 0.1 Kilometers



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BEACON ENVIRONMENTAL

Geomorphology Group
Reach Characteristics

Date: Nov 21/18 **Project:** 218416
Weather: Sunny 1°C **Watercourse:** Appleby Creek
Location: Burlington **Reach:** AC-1

Land Use	☐ Forest	☐ Agricultural	☑ Residential	☐ Reach Break
	☐ Pasture/Meadow	☐ Industrial/Commercial	☑ Other: Park	
Valley/Stream Type	☑ Unconfined	☐ Confined	☐ Partially Confined:	
	☑ Perennial	☐ Intermittent	☐ Ephemeral	☐ Reach Break
Riparian Vegetation	Vegetation Type: ☑ Trees	☑ Shrubs	☑ Grasses	☐ Reach Break
	☑ Herbaceous	Dominant Type: herb.		
	Buffer Zone: ☐ None	☑ Fragmented	☐ Continuous	
	☐ <1 Channel Width	☑ 1-5 Channel Widths	☐ >5 Channel Widths	
	Age Class: ☐ Immature (<5 y.)	☑ Established (5-30 y.)	☐ Mature (>30 y.)	

Channel Characteristics

Planform	Sinuosity:	☑ Low	☐ Moderate	☐ High	☐ Reach Break
	Gradient:	☐ Low	☑ Moderate	☐ High	
	Entrenchment:	☑ Low (dls)	☑ Moderate (uls)	☐ High	
	Riffle-Pool Spacing: 5-10m	Meander Amplitude: N/A			
Bank	Angle:	☐ 0° - 30°	☐ 30° - 60°	☑ 60° - 90°	Undercut:
	Erosion:	☐ <5%	☐ 5 – 30%	☐ 30 – 60%	☑ 60 – 100%
	Failure:	☐ None	☐ Slump	☐ Planar	☑ Mass
	Material:	☑ Clay/silt	☑ Sand	☐ Gravel	☐ Cobble
		☐ Boulder	☑ Other: gabion		
Channel	Riffle Substrate	☐ Clay/silt	☐ Sand	☑ Gravel	☑ Cobble
		☑ Boulder	☑ Other: Shale	Riffle Embeddedness: 20-30 %	
	Pool Substrate	☐ Clay/silt	☐ Sand	☑ Gravel	☑ Cobble
		☑ Boulder	☑ Other: shale, riprap		

	Riffles				Pools			
Bankfull Width (m)	7.0	7.25			5.5	5.5		
Bankfull Depth (m)	0.45	0.40			0.80	0.75		
Wetted Width (m)	4.8	5.0			3.0	4.25		
Wetted Depth (m)	0.15	0.10			0.30	0.35		

Aquatic / Instream	Vegetation: ☐ Emergent	☐ Submergent	☐ Floating	Portion (%): 0	
	Woody Debris: ☐ Not Present	☐ Present in Cutbank	☑ Present in Channel	Density: (Low)/Mod/High	
Turbidity	☑ Clear	☐ Slight	☐ Moderate	☐ High	

Recorded by: SG

BEACON ENVIRONMENTAL

Geomorphology Group
Rapid Geomorphic Assessment (RGA)

Date: Nov 21/18 **Project:** 218416 **Reach:** AC-1

PROCESS	GEOMORPHIC INDICATOR	PRESENT		SCORE
		No	Yes	
Aggradation	1. Lobate bar formation	✓		
	2. Coarse materials in riffles embedded	✓		
	3. Siltation in pools	✓		
	4. Medial / lateral bar formation		✓	
	5. Accretion on point bars	✓		0.14
	6. Poor longitudinal sorting of bed materials	✓		
	7. Deposition in the overbank zone	✓		
	Sum of Indices		1	
Degradation	1. Exposed bridge/culvert footing(s)	✓		
	2. Exposed sanitary/storm sewer/pipeline	✓		
	3. Elevated stormwater outfall(s)	✓		
	4. Undermined gabion baskets/concrete aprons/crib walls		✓	
	5. Scour pool formation downstream of culvert/storm outfall		✓	
	6. Cut face on bar formations	✓		0.3
	7. Head cutting due to knickpoint migration	✓		
	8. Terrace cut through older bar material	✓		
	9. Suspended armour layer visible in bank	✓		
	10. Channel worn into undisturbed overburden/bedrock		✓	
	Sum of Indices		3	
Widening	1. Fallen/leaning trees/fence posts		✓	
	2. Occurrence of large organic debris		✓	
	3. Exposed tree roots		✓	
	4. Basal scour on inside meander bends		✓	
	5. Basal scour on both sides of channel through riffle		✓	
	6. Length of basal scour >50% through reach		✓	0.7
	7. Gabion baskets/armourstone walls/etc. outflanked		✓	
	8. Exposed length of previously buried pipe	✓		
	9. Fracture lines along top of bank/slumping banks	✓		
	10. Exposed building foundation	✓		
	Sum of Indices		7	
Planimetric Form Adjustment	1. Formation of chute(s)		✓	
	2. Single thread to multiple channel	✓		
	3. Evolution of pool-riffle form to low-bed relief form	✓		
	4. Cut-off channel(s)	✓		
	5. Formation of island(s)	✓		
	6. Thalweg alignment out of phase with meander form		✓	
	7. Bar forms poorly formed/reworked/removed		✓	0.43
	Sum of Indices		3	
Stability Index (SI)				0.89

Source: Ministry of the Environment. 2003. Stormwater Management Planning and Design Manual. Document # 4329e. Queen's Printer for Ontario, Ontario, Canada.

Classification:

☐ **In Regime** (≤ 0.20) ☑ **In Transition/Stressed** (0.21 – 0.40) ☐ **In Adjustment** (≥0.41)

Recorded by: SG

BEACON ENVIRONMENTAL

Geomorphology Group
Rapid Stream Assessment Technique (RSAT)

Date: Nov 21/18 **Project:** 218416

Weather: Sunny 1°C **Watercourse:** Appleby Creek

Location: Burlington **Reach:** AC-1

Evaluation Category	Poor	Fair	Good	Excellent
Channel Stability	• <50% of bank network stable. • Recent bank sloughing, slumping or failure frequently observed.	• 50–70% of bank network stable. • Recent signs of bank sloughing, slumping or failure fairly common.	• 71–80% of bank network stable. • Infrequent signs of bank sloughing, slumping or failure.	• >80% of bank network stable. • No evidence of bank sloughing, slumping or failure.
	• Stream bend areas highly unstable. • Outer bank height 1.2 m above stream (2.1 m above stream for large mainstem areas). • Overhang >0.8–1.0 m.	• Stream bend areas unstable. • Outer bank height 0.9–1.2 m above stream (1.5–2.1 m above stream for large mainstem areas). • Bank overhang 0.8–0.9 m.	• Stream bend areas stable. • Outer bank height 0.6–0.9 m above stream bank (1.2–1.5 m above stream bank for large mainstem areas). • Overhang 0.6–0.8 m.	• Stream bend areas very stable. • Height <0.6 m above stream (<1.2 m above stream for large mainstem areas). • Bank overhang <0.6 m.
	• Young exposed tree roots abundant. • >6 recent large tree falls per stream mile.	• Young exposed tree roots common. • 4–5 recent (large) tree falls per stream mile.	• Exposed tree roots predominately old and large, smaller young roots scarce. • 2–3 recent (large) tree falls per stream mile.	• Exposed tree roots old, large and woody. • Generally 0–1 recent (large) tree falls per stream mile.
	• Bottom 1/3 of bank is highly erodible material • Plant/soil matrix severely compromised.	• Bottom 1/3 of bank is generally highly erodible material • Plant/soil matrix compromised.	• Bottom 1/3 of bank is generally highly resistant plant/soil matrix or material.	• Bottom 1/3 of bank is generally highly resistant plant/soil matrix or material.
	• Channel cross-section is generally trapezoidally-shaped.	• Channel cross-section is generally trapezoidally-shaped.	• Channel cross-section is generally V- or U-shaped	• Channel cross-section is generally V- or U-shaped
Point Range	0 1 2	3 4 5	6 7 8	9 10 11

Evaluation Category	Poor	Fair	Good	Excellent
Channel Scouring / Sediment Deposition	• >75% embedded (>85% embedded for large mainstem areas).	• 50–75% embedded (60–85% embedded for large mainstem areas).	• 25–49% embedded (35-59% embedded for large mainstem areas).	• Riffle embeddness <25% sand-silt (<35% for large mainstem areas).
	• Few, if any, deep pools. • Pool substrate >81% sand-silt.	• Low to moderate number of deep pools. • Pool substrate 60–80% sand-silt.	• Moderate number of deep pools. • Pool substrate 30–59% sand-silt.	• High number of deep pools >61 cm (>122 cm for large mainstem areas). • Pool substrate <30% composed of sand-silt.
	• Streak marks and/or "banana" deposits common.	• Streak marks and/or "banana" deposits common.	• Streak marks and/or "banana" deposits uncommon.	• Streambed streak marks and/or banana-shaped sediment deposits absent.
	• Fresh, large sand deposits very common in channel. • Moderate to heavy sand deposition along major portion of overbank area very common.	• Fresh, large sand deposits in channel common. • Small localized areas of fresh sand deposits along top of low banks.	• Fresh, large sand deposits in channel uncommon. • Small localized areas of fresh sand deposits along top of low banks.	• Fresh, large sand deposits in channel rare or absent. • No evidence of fresh sediment deposition on overbank.
	• Point bars moderate to large and unstable with high amount of fresh sand present at most stream bends.	• Point bars moderate to large and unstable with high amount of fresh sand common.	• Point bars small and stable, well vegetated and/or armoured with little or no fresh sand.	• Point bars few, small and stable, well vegetated and/or armoured with little or no fresh sand.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Physical Instream Habitat	• Wetted perimeter <40% of bottom width (<45% for large mainstem areas).	• Wetted perimeter 40–60% of bottom width (45–65% for large mainstem areas).	• Wetted perimeter 61–85% of bottom width (66–90% for large mainstem areas).	• Wetted perimeter >85% of bottom channel width (>90% for large mainstem areas).
	• Dominated by one habitat type (usually runs) and by one velocity and depth condition (slow and shallow) (for large mainstem areas, few riffles present, runs and pools dominant, velocity and depth diversity low).	• Few pools present; riffles and runs dominant; velocity and depth generally slow and shallow (for large mainstem areas, runs and pools dominant, velocity and depth diversity intermediate).	• Good mix between riffles, runs and pools • Relatively diverse velocity and depth of flow.	• Riffles, runs and pool habitat present. • Diverse velocity and depth of flow present (i.e., slow, fast, shallow and deep water).
	• Riffle substrate composition predominately gravel with high percentage of sand. • <5% cobble.	• Riffle substrate composition predominately small cobble, gravel and sand. • 5–24% cobble.	• Riffle substrate composition has good mix of gravel, cobble and rubble material. • 25-49% cobble.	• Riffle substrate composition: cobble, gravel, rubble, boulder mix with little sand. • >50% cobble.
	• Riffle depth <10 cm for large mainstem area.	• Riffle depth 10–15 cm for large mainstem area.	• Riffle depth 15–20 cm for large mainstem areas.	• Riffle depth >8% for large 20 cm mainstem areas.
	• Large pools generally <30 cm deep (<61 cm for large mainstem areas) and devoid of cover/structure.	• Large pools generally 30–46 cm deep (61–91 cm for large mainstem areas) with little or no cover/structure.	• Large pools generally 46–61 cm deep (91–122 cm for large mainstem areas) with some cover/structure.	• Large pools generally >61 cm deep (>122 cm for large mainstem areas) with good overhead cover/structure
	• Extensive channel alteration or point bar formation/enlargement.	• Moderate increase in point bar and/or in amount of channel modification.	• Slight increase in point bar formation/enlargement or slight amount of channel modification.	• No channel alteration or significant point bar formation or enlargement.
	• Riffle/pool ratio: 0.49:1<; >1.51:1	• Riffle/pool ratio: 0.5–0.69:1; 1.31-1.5:1.	• Riffle/pool ratio: 0.9–0.89:1; 1.11–1.3:1.	• Riffle/pool ratio: 0.9–1.1:1.
	• Summer afternoon H_20 temp >80°F.	• Summer afternoon H_20 temp 75–80°F.	• Summer afternoon H_20 temp 68–75°F.	• Summer afternoon H_20 temp <68°F.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Water Quality	• Substrate fouling level: High (>50%).	• Substrate fouling level: Moderate (21–50%).	• Substrate fouling level: Very Light (11–20%).	• Substrate fouling level: 0–10% (rock underside).
	• TDS: >150 mg/L; Brown.	• TDS: 101–150 mg/L; Grey.	• TDS: 50–100 mg/L; Slightly Grey.	• TDS: <50 mg/L; Clear Flow.
	• Objects visible to depth <0.15 m below surface.	• Objects visible to depth 0.15–0.5 m below surface.	• Objects visible to depth 0.5–1 m below surface.	• Clear water – objects visible to depth >1 m below surface.
	• Moderate to strong organic odour.	• Slight to moderate odour.	• Slight organic odour.	• No odour.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Riparian Habitat Conditions	• Riparian area mostly non-woody vegetation. • Narrow riparian area.	• Riparian area predominantly wooded but with major localized gaps.	• Forested buffer generally >31 m wide along major portion of both banks.	• Wide (>60 m) mature forested buffer along both banks.
	• Canopy coverage: <50% shading (30% for large mainstem areas).	• Canopy coverage: 50–60% shading (30–44% for large mainstem areas).	• Canopy coverage: 60–79% shading (45–59% for large mainstem areas).	• Canopy coverage: >80% shading (>60% for large mainstem areas).
Point Range	0 1	2 3	4 5	6 7

Source: Galli, J. 1996. Rapid stream assessment technique, field methods. Metropolitan Washington Council of Governments. 36pp.

Total Overall Score (0–42): 18

Ranking: ☐ Poor (<13) ☑ Fair (13–24) ☐ Good (25–34) ☐ Excellent (35–42)

Recorded by

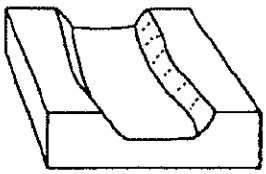
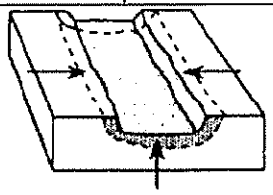
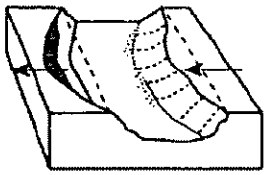
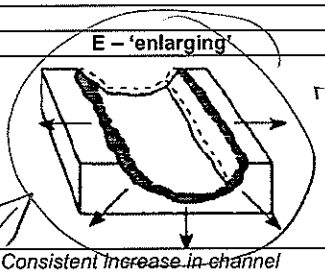
BEACON ENVIRONMENTAL

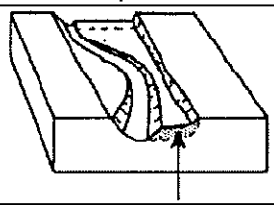
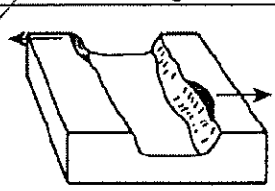
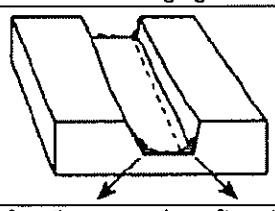
Geomorphology Group
Down's (1995) Model

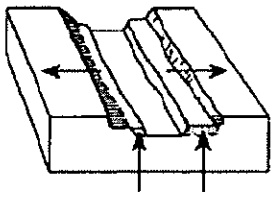
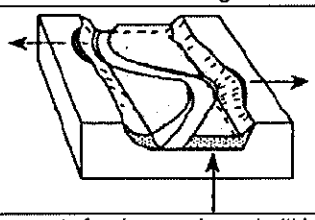
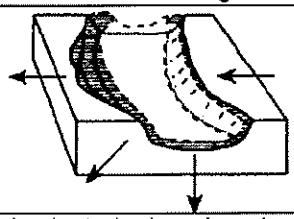
Date: Nov 21/18 **Project:** 218416

Weather: Sunny 1°C **Watercourse:** Appleby Ck

Location: Burlington **Reach:** AC-1

S – 'stable'	D – 'depositional'	M – 'lateral migration'	E – 'enlarging'
			
No observable morphological adjustment in process	***Consistent** decrease in channel width and/or depth*	*Migration of **most** bends; cross-sectional dimensions preserved*	*Consistent increase in channel width and/or depth*
☐ no bank slumping/failure/undercutting	☐ sediment deposition on bed (e.g. bar development, shadow deposits, high embeddedness)	☐ erosion along **outer bank** (e.g. slumping, young tree roots exposed, tree falls, undercutting)	☐ erosion along **both** banks (e.g. slumping, young tree roots exposed, tree falls)
☐ old tree roots exposed	☐ sediment deposited along banks	☐ deposition along **inner bank** (i.e. point bar development)	☐ no bar formation, scoured bed, low embeddedness
☐ no tree falls	☐ no bank erosion	☐ no alluvial terrace	☐ no alluvial terrace
☐ no alluvial terrace	☐ no alluvial terrace		

d – 'depositional'	m – 'lateral migration'	e – 'enlarging'
		
Selective deposition resulting in reduced channel width	*Initiation of alternating bank erosion in straightened channels or migration of only sharpest bends*	*Initiation of continuous erosion, **often** at channel toe*
☐ low-flow channel between outer banks/valley walls	☐ generally straight	☐ channel downcutting (e.g. bed scour, low embeddedness)
☐ alluvial terrace/valley wall	☐ stable except at sharp bends	☐ steep, high banks above bankfull level
☐ valley wall contacts at **few, if any** meander bends	☐ sharp bends with outside bank erosion, point-bar/cut bank development and undercutting	☐ no alluvial terrace
	☐ no alluvial terrace	

C – 'compound'	R – 'recovering'	U – 'undercutting'
		
Aggradation of channel bed with erosion of channel banks	*Development of a sinuous channel within straightened channel, including erosion of alternating valley walls*	*Active bed and outer bank erosion; migration of bend; coarse inner bank deposits*
☐ bank erosion (slumping, exposed tree roots)	☐ straight alluvial terrace/valley wall	☐ erosion along **outer bank** (e.g. slumping, young tree roots exposed, tree falls, undercutting)
☐ sediment deposition on bed (e.g. bar development, shadow deposits, high embeddedness)	☐ valley wall contact and erosion at **majority** of meander bends	☐ deposition along **inner bank** (i.e. point bar development)
☐ alluvial terrace with erosion		☐ scoured bed, low embeddedness, no bar formation
		☐ no alluvial terrace

Source: Downs, P.W. 1995. Estimating the probability of river channel adjustment. *Earth Surface Processes and Landforms.* **20**: 687-705.

Recorded by: SG

BEACON ENVIRONMENTAL

Geomorphology Group
Photos & Notes

Date: Nov 21/18 **Project:** 218416

Weather: sunny 1°C **Watercourse:** Appleby Ck

Location: Burlington **Reach:** Ac-1

Photo / WP #	Notes	Photo / WP #	Notes
173 805	d/s view pot. reach break (less entrenched)	182 820	d/s view, thalweg misalign & scour pool
173 806	u/s view from extent assessed general riffle conditions	183 821	u/s view exposed shale bank
174 807	d/s view - thalweg out of alignment	184 822	d/s view 2° channel / chute formation
175 808	u/s view undermined, outflank gabion	184 823	u/s view east culvert & storm outlet
176 809	u/s view hydraulic constriction, channel @ LB	184 824	u/s view west culvert & storm outlet
176 810	zoom in, u/s view gabion undermined		
176 811	d/s view basal scour & failing gabions		
177 812	d/s view from ped x-ing		
177 813	u/s view from ped x-ing		
178 814	d/s view gabion structure / CSP outflank? scour pool		
179 815	u/s view gabion wall RB undermined		
180 816	d/s view of riffle & gabion wall (RB)		
180 817	u/s view towards Fairview basal scour both side riffle		
181 818	u/s view lateral bar (shale)		
182 819	u/s view 2° channel at Fairview Rd		

Additional Notes:

Recorded by: SG

BEACON ENVIRONMENTAL

Geomorphology Group
Reach Characteristics

Date: Nov 21/18 **Project:** 218416

Weather: Sunny 1°C **Watercourse:** Appleby Ck

Location: Burlington oval Court **Reach:** AC-2

Land Use	☐ Forest	☐ Agricultural	☐ Residential	☐ Reach Break	
	☐ Pasture/Meadow	☑ Industrial/Commercial	☐ Other:		
Valley/Stream Type	☐ Unconfined	☐ Confined	☐ Partially Confined:		
	☑ Perennial	☐ Intermittent	☐ Ephemeral	☐ Reach Break	
Riparian Vegetation	Vegetation Type: ☑ Trees	☑ Shrubs	☑ Grasses	☐ Reach Break	
	☑ Herbaceous	Dominant Type:			
	Buffer Zone: ☐ None	☐ Fragmented	☑ Continuous		
	☐ <1 Channel Width	☑ 1-5 Channel Widths	☐ >5 Channel Widths		
	Age Class: ☐ Immature (<5 y.)	☐ Established (5-30 y.)	☐ Mature (>30 y.)		

Channel Characteristics

Planform	Sinuosity: ☑ Low	☐ Moderate	☐ High	☐ Reach Break	
	Gradient: ☐ Low	☑ Moderate	☐ High		
	Entrenchment: ☐ Low	☑ Moderate	☑ High		
	Riffle-Pool Spacing: 5-10 m	Meander Amplitude: N/A			
Bank	Angle: ☐ 0° - 30°	☐ 30° - 60°	☑ 60° - 90°	Undercut: 0.25	
	Erosion: ☐ <5%	☐ 5 – 30%	☐ 30 – 60%	☑ 60 – 100%	
	Failure: ☐ None	☐ Slump	☐ Planar	☑ Mass	
	Material: ☑ Clay/silt	☑ Sand	☐ Gravel	☐ Cobble	
	☐ Boulder	☐ Other:			
Channel	Riffle Substrate ☐ Clay/silt	☐ Sand	☑ Gravel	☑ Cobble	
	☑ Boulder	☑ Other: Shale	Riffle Embeddedness: 5-25 %		
	Pool Substrate ☑ Clay/silt	☑ Sand	☑ Gravel	☑ Cobble	
	☐ Boulder	☑ Other: till			

	Riffles			Pools			
Bankfull Width (m)	5.5	5.5	7.0	4.75	6.0	5.25	7.0
Bankfull Depth (m)	0.50	0.40	0.35	1.0	0.65	0.75	0.70
Wetted Width (m)	3.0	4.0	4.25	3.75	3.75	3.75	4.5
Wetted Depth (m)	0.15	0.18	0.07	0.55	0.20	0.35	0.35

Aquatic / Instream	Vegetation: ☐ Emergent	☐ Submergent	☐ Floating	Portion (%): 0	
	Woody Debris: ☐ Not Present	☐ Present in Cutbank	☑ Present in Channel	Density: Low/(Mod)/High	
Turbidity	☑ Clear	☐ Slight	☐ Moderate	☐ High	

Recorded by: _____

BEACON ENVIRONMENTAL

Geomorphology Group
Rapid Geomorphic Assessment (RGA)

Date: Nov 21/18 **Project:** 218416 **Reach:** AC-2

PROCESS	GEOMORPHIC INDICATOR	PRESENT		SCORE
		No	Yes	
Aggradation	1. Lobate bar formation	✓		
	2. Coarse materials in riffles embedded	✓		
	3. Siltation in pools	✓	✓	
	4. Medial / lateral bar formation	✓	✓	
	5. Accretion on point bars	✓		
	6. Poor longitudinal sorting of bed materials	✓		
	7. Deposition in the overbank zone	✓		0.14
	Sum of Indices	✓	1	
Degradation	1. Exposed bridge/culvert footing(s)	✓		
	2. Exposed sanitary/storm sewer/pipeline	✓		
	3. Elevated stormwater outfall(s)	✓		
	4. Undermined gabion baskets/concrete aprons/crib walls		✓	
	5. Scour pool formation downstream of culvert/storm outfall		✓	
	6. Cut face on bar formations	✓		
	7. Head cutting due to knickpoint migration (shale)		✓	0.40
	8. Terrace cut through older bar material	✓		
	9. Suspended armour layer visible in bank	✓		
	10. Channel worn into undisturbed overburden/bedrock		✓	
	Sum of Indices			
Widening	1. Fallen/leaning trees/fence posts		✓	
	2. Occurrence of large organic debris		✓	
	3. Exposed tree roots		✓	
	4. Basal scour on inside meander bends		✓	
	5. Basal scour on both sides of channel through riffle		✓	
	6. Length of basal scour >50% through reach		✓	
	7. Gabion baskets/armourstone walls/etc. outflanked		✓	0.70
	8. Exposed length of previously buried pipe	✓		
	9. Fracture lines along top of bank/slumping banks	✓		
	10. Exposed building foundation	✓		
	Sum of Indices			
Planimetric Form Adjustment	1. Formation of chute(s)		✓	
	2. Single thread to multiple channel	✓		
	3. Evolution of pool-riffle form to low-bed relief form	✓		
	4. Cut-off channel(s)	✓		0.43
	5. Formation of island(s)	✓		
	6. Thalweg alignment out of phase with meander form		✓	
	7. Bar forms poorly formed/reworked/removed		✓	
	Sum of Indices		3	
Stability Index (SI)				0.42

Source: Ministry of the Environment. 2003. Stormwater Management Planning and Design Manual. Document # 4329e. Queen's Printer for Ontario, Ontario, Canada.

Classification:

☐ **In Regime** (≤ 0.20) ☐ **In Transition/Stressed** (0.21 – 0.40) ☑ **In Adjustment** (≥0.41)

Recorded by: SG

BEACON ENVIRONMENTAL

Geomorphology Group
Rapid Stream Assessment Technique (RSAT)

Date: Nov 21/18 **Project:** 218116

Weather: sunny 1°C **Watercourse:** Appleby Creek

Location: Burlington Oval Court **Reach:** AC-2

Evaluation Category	Poor	Fair	Good	Excellent
Channel Stability	• <50% of bank network stable. • Recent bank sloughing, slumping or failure frequently observed.	• 50–70% of bank network stable. • Recent signs of bank sloughing, slumping or failure fairly common.	• 71–80% of bank network stable. • Infrequent signs of bank sloughing, slumping or failure.	• >80% of bank network stable. • No evidence of bank sloughing, slumping or failure.
	• Stream bend areas highly unstable. • Outer bank height 1.2 m above stream (2.1 m above stream for large mainstem areas). • Overhang >0.8–1.0 m.	• Stream bend areas unstable. • Outer bank height 0.9–1.2 m above stream (1.5–2.1 m above stream for large mainstem areas). • Bank overhang 0.8–0.9 m.	• Stream bend areas stable. • Outer bank height 0.6–0.9 m above stream bank (1.2–1.5 m above stream bank for large mainstem areas). • Overhang 0.6–0.8 m.	• Stream bend areas very stable. • Height <0.6 m above stream (<1.2 m above stream for large mainstem areas). • Bank overhang <0.6 m.
	• Young exposed tree roots abundant. • >6 recent large tree falls per stream mile.	• Young exposed tree roots common. • 4–5 recent (large) tree falls per stream mile.	• Exposed tree roots predominately old and large, smaller young roots scarce. • 2–3 recent (large) tree falls per stream mile.	• Exposed tree roots old, large and woody. • Generally 0–1 recent (large) tree falls per stream mile.
	• Bottom 1/3 of bank is highly erodible material • Plant/soil matrix severely compromised.	• Bottom 1/3 of bank is generally highly erodible material • Plant/soil matrix compromised.	• Bottom 1/3 of bank is generally highly resistant plant/soil matrix or material.	• Bottom 1/3 of bank is generally highly resistant plant/soil matrix or material.
	• Channel cross-section is generally trapezoidally-shaped.	• Channel cross-section is generally trapezoidally-shaped.	• Channel cross-section is generally V- or U-shaped	• Channel cross-section is generally V- or U-shaped
Point Range	0 1 2	3 4 5	6 7 8	9 10 11

Evaluation Category	Poor	Fair	Good	Excellent
Channel Scouring / Sediment Deposition	• >75% embedded (>85% embedded for large mainstem areas).	• 50–75% embedded (60–85% embedded for large mainstem areas).	• 25–49% embedded (35-59% embedded for large mainstem areas).	• Riffle embeddness <25% sand-silt (<35% for large mainstem areas).
	• Few, if any, deep pools. • Pool substrate >81% sand-silt.	• Low to moderate number of deep pools. • Pool substrate 60–80% sand-silt.	• Moderate number of deep pools. • Pool substrate 30–59% sand-silt.	• High number of deep pools >61 cm (>122 cm for large mainstem areas). • Pool substrate <30% composed of sand-silt.
	• Streak marks and/or "banana" deposits common.	• Streak marks and/or "banana" deposits common.	• Streak marks and/or "banana" deposits uncommon.	• Streambed streak marks and/or banana-shaped sediment deposits absent.
	• Fresh, large sand deposits very common in channel. • Moderate to heavy sand deposition along major portion of overbank area very common.	• Fresh, large sand deposits in channel common. • Small localized areas of fresh sand deposits along top of low banks.	• Fresh, large sand deposits in channel uncommon. • Small localized areas of fresh sand deposits along top of low banks.	• Fresh, large sand deposits in channel rare or absent. • No evidence of fresh sediment deposition on overbank.
	• Point bars moderate to large and unstable with high amount of fresh sand present at most stream bends.	• Point bars moderate to large and unstable with high amount of fresh sand common.	• Point bars small and stable, well vegetated and/or armoured with little or no fresh sand.	• Point bars few, small and stable, well vegetated and/or armoured with little or no fresh sand.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Physical Instream Habitat	• Wetted perimeter <40% of bottom width (<45% for large mainstem areas).	• Wetted perimeter 40–60% of bottom width (45–65% for large mainstem areas).	• Wetted perimeter 61–85% of bottom width (66–90% for large mainstem areas).	• Wetted perimeter >85% of bottom channel width (>90% for large mainstem areas).
	• Dominated by one habitat type (usually runs) and by one velocity and depth condition (slow and shallow) (for large mainstem areas, few riffles present, runs and pools dominant, velocity and depth diversity low).	• Few pools present; riffles and runs dominant; velocity and depth generally slow and shallow (for large mainstem areas, runs and pools dominant, velocity and depth diversity intermediate).	• Good mix between riffles, runs and pools • Relatively diverse velocity and depth of flow.	• Riffles, runs and pool habitat present. • Diverse velocity and depth of flow present (i.e., slow, fast, shallow and deep water).
	• Riffle substrate composition predominately gravel with high percentage of sand. • <5% cobble.	• Riffle substrate composition predominately small cobble, gravel and sand. • 5–24% cobble.	• Riffle substrate composition has good mix of gravel, cobble and rubble material. • 25-49% cobble.	• Riffle substrate composition: cobble, gravel, rubble, boulder mix with little sand. • >50% cobble.
	• Riffle depth <10 cm for large mainstem area.	• Riffle depth 10–15 cm for large mainstem area.	• Riffle depth 15–20 cm for large mainstem areas.	• Riffle depth >8% for large 20 cm mainstem areas.
	• Large pools generally <30 cm deep (<61 cm for large mainstem areas) and devoid of cover/structure.	• Large pools generally 30–46 cm deep (61–91 cm for large mainstem areas) with little or no cover/structure.	• Large pools generally 46–61 cm deep (91–122 cm for large mainstem areas) with some cover/structure.	• Large pools generally >61 cm deep (>122 cm for large mainstem areas) with good overhead cover/structure
	• Extensive channel alteration or point bar formation/enlargement.	• Moderate increase in point bar and/or in amount of channel modification.	• Slight increase in point bar formation/enlargement or slight amount of channel modification.	• No channel alteration or significant point bar formation or enlargement.
	• Riffle/pool ratio: 0.49:1<; >1.51:1	• Riffle/pool ratio: 0.5–0.69:1; 1.31-1.5:1.	• Riffle/pool ratio: 0.9–0.89:1; 1.11–1.3:1.	• Riffle/pool ratio: 0.9–1.1:1.
	• Summer afternoon H_20 temp >80°F.	• Summer afternoon H_20 temp 75–80°F.	• Summer afternoon H_20 temp 68–75°F.	• Summer afternoon H_20 temp <68°F.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Water Quality	• Substrate fouling level: High (>50%).	• Substrate fouling level: Moderate (21–50%).	• Substrate fouling level: Very Light (11–20%).	• Substrate fouling level: 0–10% (rock underside).
	• TDS: >150 mg/L; Brown.	• TDS: 101–150 mg/L; Grey.	• TDS: 50–100 mg/L; Slightly Grey.	• TDS: <50 mg/L; Clear Flow.
	• Objects visible to depth <0.15 m below surface.	• Objects visible to depth 0.15–0.5 m below surface.	• Objects visible to depth 0.5–1 m below surface.	• Clear water – objects visible to depth >1 m below surface.
	• Moderate to strong organic odour.	• Slight to moderate odour.	• Slight organic odour.	• No odour.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Riparian Habitat Conditions	• Riparian area mostly non-woody vegetation. • Narrow riparian area.	• Riparian area predominantly wooded but with major localized gaps.	• Forested buffer generally >31 m wide along major portion of both banks.	• Wide (>60 m) mature forested buffer along both banks.
	• Canopy coverage: <50% shading (30% for large mainstem areas).	• Canopy coverage: 50–60% shading (30–44% for large mainstem areas).	• Canopy coverage: 60–79% shading (45–59% for large mainstem areas).	• Canopy coverage: >80% shading (>60% for large mainstem areas).
Point Range	0 1	2 3	4 5	6 7

Source: Galli, J. 1996. Rapid stream assessment technique, field methods. Metropolitan Washington Council of Governments. 36pp.

Total Overall Score (0–42): 14.5

Ranking: ☐ Poor (<13) ☑ Fair (13–24) ☐ Good (25–34) ☐ Excellent (35–42)

Recorded by SGS

BEACON ENVIRONMENTAL

Geomorphology Group
Photos & Notes

Date: Nov 21/18 **Project:** 218416

Weather: Sunny 19C **Watercourse:** Appleby Ck

Location: Burlington Oval Court **Reach:** AC-2

Photo / WP #	Notes	Photo / WP #	Notes
185 825	2° channel/chute uls view gabion weir ~0.6 east culvert	195 840	uls view gabion (LB)
185 826	uls view 2° channel/chute at west culvert	196 841	uls view shale cascade
186 827	west channel pool (exp till) Wb=3.5m WW=2.25m dp=0.15 dW=0.42	196 842	dls view gabion & undercut bank ~0.25m
187 828	uls view debris jam & 2° flow path / RP	197 843	dls view debris & cascade at gabion wall
188 829	dls view debris jam	197 844	dls view - basal scour at riffle
189 830	dls view pool - channel entrenched	197 845	uls view undermined gabion
189 831	uls view gabion wall (RB) undermined/undercut	198 846	uls view till cascade & GO outfall
189 832	zoom in @ gabion	198 847	dls view from outfall undermined gabion
190 833	uls view basal scour both sides riffle	198 848	zoom in GO outfall
191 834	dls view lateral bar - shale	199 849	dls view - gabion wall at GO1 of (RB)
191 835	apparent storm outlet (LB)	200 850	uls view rock revet & riffle
192 836	dls view exposed shale face	201 851	dls view riffle
192 837	uls view shale cascade ~0.30m	202 852	uls view exposed shale face
193 838	uls view general riffle condition	203 853	dls view exposed shale face at fence line
194 839	uls view exposed shale face	204 854	uls view GO crossing

Additional Notes:

Recorded by: SG

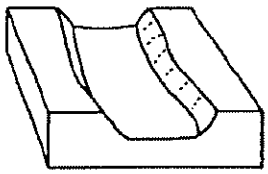
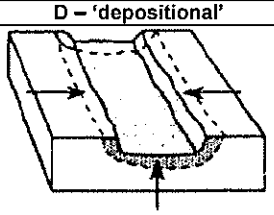
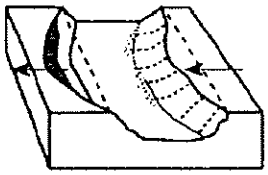
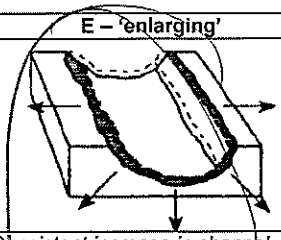
BEACON ENVIRONMENTAL

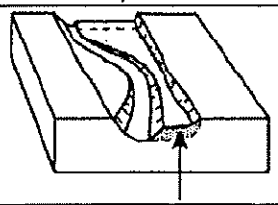
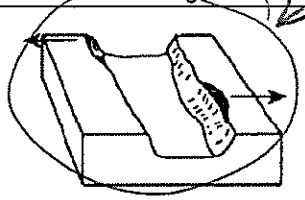
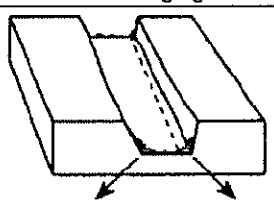
Geomorphology Group
Down's (1995) Model

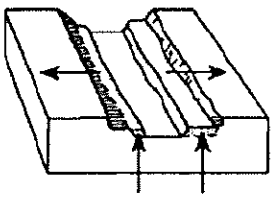
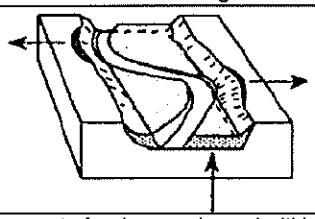
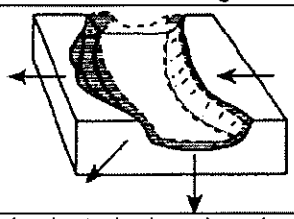
Date: Nov 21/18 **Project:** 218416

Weather: Sunny 1°C **Watercourse:** Appleby Ck

Location: Burlington Oval Court **Reach:** AC-2

S – 'stable'	D – 'depositional'	M – 'lateral migration'	E – 'enlarging'
			
No observable morphological adjustment in process	***Consistent** decrease in channel width and/or depth*	*Migration of **most** bends; cross-sectional dimensions preserved*	*Consistent increase in channel width and/or depth*
☐ no bank slumping/failure/undercutting ☐ old tree roots exposed ☐ no tree falls ☐ no alluvial terrace	☐ sediment deposition on bed (e.g. bar development, shadow deposits, high embeddedness) ☐ sediment deposited along banks ☐ no bank erosion ☐ no alluvial terrace	☐ erosion along **outer bank** (e.g. slumping, young tree roots exposed, tree falls, undercutting) ☐ deposition along **inner bank** (i.e. point bar development) ☐ no alluvial terrace	☐ erosion along **both** banks (e.g. slumping, young tree roots exposed, tree falls) ☐ no bar formation, scoured bed, low embeddedness ☐ no alluvial terrace

d – 'depositional'	m – 'lateral migration'	e – 'enlarging'
		
Selective deposition resulting in reduced channel width	*Initiation of alternating bank erosion in straightened channels or migration of only sharpest bends*	*Initiation of continuous erosion, **often** at channel toe*
☐ low-flow channel between outer banks/valley walls ☐ alluvial terrace/valley wall ☐ valley wall contacts at **few, if any** meander bends	☐ generally straight ☐ stable except at sharp bends ☐ sharp bends with outside bank erosion, point-bar/cut bank development and undercutting ☐ no alluvial terrace	☐ channel downcutting (e.g. bed scour, low embeddedness) ☐ steep, high banks above bankfull level ☐ no alluvial terrace

C – 'compound'	R – 'recovering'	U – 'undercutting'
		
Aggradation of channel bed with erosion of channel banks	*Development of a sinuous channel within straightened channel, including erosion of alternating valley walls*	*Active bed and outer bank erosion; migration of bend; coarse inner bank deposits*
☐ bank erosion (slumping, exposed tree roots) ☐ sediment deposition on bed (e.g. bar development, shadow deposits, high embeddedness) ☐ alluvial terrace with erosion	☐ straight alluvial terrace/valley wall ☐ valley wall contact and erosion at **majority** of meander bends	☐ erosion along **outer bank** (e.g. slumping, young tree roots exposed, tree falls, undercutting) ☐ deposition along **inner bank** (i.e. point bar development) ☐ scoured bed, low embeddedness, no bar formation ☐ no alluvial terrace

Source: Downs, P.W. 1995. Estimating the probability of river channel adjustment. *Earth Surface Processes and Landforms*. **20**: 687-705.

Recorded by: SG

Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

Oval Court - Appleby Creek

Notes: Enter map notes



Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion

Wetland
- Provincially Significant Wetland Evaluated
- Non - Provincially Significant Wetland Evaluated
- Unevaluated Wetland

Area of Natural Heritage & Scientific Interest (ANSI)
- Provincially Significant Life Science ANSI
- Provincially Significant Earth Science ANSI

Greenbelt Plan
- Boundary
- River Valley Connections

Land Use Designations
- Protected Countryside
- Towns and Villages
- Hamlets
- Urban River Valley
- Specialty Crop Area

Niagara Escarpment Plan (NEP)
- Boundary
- Parks and Open Space System

Land Use Designations
- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Escarpment Recreation Area
- Urban Area
- Minor Urban Centre

Oak Ridges Moraine Conservation Plan (ORM)
- Boundary

Land Use Designations
- Natural Core Area
- Natural Linkage Area
- Countryside Area
- Rural Settlement
- Palgrave Estates Residential Community
- Settlement Area

0.1 0 0.04 0.1 Kilometers



This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources and Forestry(OMNRF) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

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BEACON ENVIRONMENTAL

Geomorphology Group
Reach Characteristics

Date: Nov 21/18 **Project:** 218416
Weather: Sunny 1°C **Watercourse:** Appleby Creek
Location: Burlington **Reach:** AC-1

Land Use	☐ Forest	☐ Agricultural	☑ Residential	☐ Reach Break
	☐ Pasture/Meadow	☐ Industrial/Commercial	☑ Other: Park	
Valley/Stream Type	☑ Unconfined	☐ Confined	☐ Partially Confined:	
	☑ Perennial	☐ Intermittent	☐ Ephemeral	☐ Reach Break
Riparian Vegetation	Vegetation Type: ☑ Trees	☑ Shrubs	☑ Grasses	☐ Reach Break
	☑ Herbaceous	Dominant Type: herb.		
	Buffer Zone: ☐ None	☑ Fragmented	☐ Continuous	
	☐ <1 Channel Width	☑ 1-5 Channel Widths	☐ >5 Channel Widths	
	Age Class: ☐ Immature (<5 y.)	☑ Established (5-30 y.)	☐ Mature (>30 y.)	

Channel Characteristics

Planform	Sinuosity:	☑ Low	☐ Moderate	☐ High	☐ Reach Break
	Gradient:	☐ Low	☑ Moderate	☐ High	
	Entrenchment:	☑ Low (dls)	☑ Moderate (uls)	☐ High	
	Riffle-Pool Spacing: 5-10m	Meander Amplitude: N/A			
Bank	Angle:	☐ 0° - 30°	☐ 30° - 60°	☑ 60° - 90°	Undercut:
	Erosion:	☐ <5%	☐ 5 – 30%	☐ 30 – 60%	☑ 60 – 100%
	Failure:	☐ None	☐ Slump	☐ Planar	☑ Mass
	Material:	☑ Clay/silt	☑ Sand	☐ Gravel	☐ Cobble
		☐ Boulder	☑ Other: gabion		
Channel	Riffle Substrate	☐ Clay/silt	☐ Sand	☑ Gravel	☑ Cobble
		☑ Boulder	☑ Other: Shale	Riffle Embeddedness: 20-30 %	
	Pool Substrate	☐ Clay/silt	☐ Sand	☑ Gravel	☑ Cobble
		☑ Boulder	☑ Other: shale, riprap		

	Riffles				Pools			
Bankfull Width (m)	7.0	7.25			5.5	5.5		
Bankfull Depth (m)	0.45	0.40			0.80	0.75		
Wetted Width (m)	4.8	5.0			3.0	4.25		
Wetted Depth (m)	0.15	0.10			0.30	0.35		

Aquatic / Instream	Vegetation: ☐ Emergent	☐ Submergent	☐ Floating	Portion (%): 0	
	Woody Debris: ☐ Not Present	☐ Present in Cutbank	☑ Present in Channel	Density: (Low)/Mod/High	
Turbidity	☑ Clear	☐ Slight	☐ Moderate	☐ High	

Recorded by: SG

BEACON ENVIRONMENTAL

Geomorphology Group
Rapid Geomorphic Assessment (RGA)

Date: Nov 21/18 **Project:** 218416 **Reach:** AC-1

PROCESS	GEOMORPHIC INDICATOR	PRESENT		SCORE
		No	Yes	
Aggradation	1. Lobate bar formation	✓		
	2. Coarse materials in riffles embedded	✓		
	3. Siltation in pools	✓		
	4. Medial / lateral bar formation		✓	
	5. Accretion on point bars	✓		0.14
	6. Poor longitudinal sorting of bed materials	✓		
	7. Deposition in the overbank zone	✓		
	Sum of Indices		1	
Degradation	1. Exposed bridge/culvert footing(s)	✓		
	2. Exposed sanitary/storm sewer/pipeline	✓		
	3. Elevated stormwater outfall(s)	✓		
	4. Undermined gabion baskets/concrete aprons/crib walls		✓	
	5. Scour pool formation downstream of culvert/storm outfall		✓	
	6. Cut face on bar formations	✓		0.3
	7. Head cutting due to knickpoint migration	✓		
	8. Terrace cut through older bar material	✓		
	9. Suspended armour layer visible in bank	✓		
	10. Channel worn into undisturbed overburden/bedrock		✓	
	Sum of Indices		3	
Widening	1. Fallen/leaning trees/fence posts		✓	
	2. Occurrence of large organic debris		✓	
	3. Exposed tree roots		✓	
	4. Basal scour on inside meander bends		✓	
	5. Basal scour on both sides of channel through riffle		✓	
	6. Length of basal scour >50% through reach		✓	0.7
	7. Gabion baskets/armourstone walls/etc. outflanked		✓	
	8. Exposed length of previously buried pipe	✓		
	9. Fracture lines along top of bank/slumping banks	✓		
	10. Exposed building foundation	✓		
	Sum of Indices		7	
Planimetric Form Adjustment	1. Formation of chute(s)		✓	
	2. Single thread to multiple channel	✓		
	3. Evolution of pool-riffle form to low-bed relief form	✓		
	4. Cut-off channel(s)	✓		
	5. Formation of island(s)	✓		
	6. Thalweg alignment out of phase with meander form		✓	
	7. Bar forms poorly formed/reworked/removed		✓	0.43
	Sum of Indices		3	
Stability Index (SI)				0.89

Source: Ministry of the Environment. 2003. Stormwater Management Planning and Design Manual. Document # 4329e. Queen's Printer for Ontario, Ontario, Canada.

Classification:

☐ **In Regime** (≤ 0.20) ☑ **In Transition/Stressed** (0.21 – 0.40) ☐ **In Adjustment** (≥0.41)

Recorded by: SG

BEACON ENVIRONMENTAL

Geomorphology Group
Rapid Stream Assessment Technique (RSAT)

Date: Nov 21/18 **Project:** 218416

Weather: Sunny 1°C **Watercourse:** Appleby Creek

Location: Burlington **Reach:** AC-1

Evaluation Category	Poor	Fair	Good	Excellent
Channel Stability	• <50% of bank network stable. • Recent bank sloughing, slumping or failure frequently observed.	• 50–70% of bank network stable. • Recent signs of bank sloughing, slumping or failure fairly common.	• 71–80% of bank network stable. • Infrequent signs of bank sloughing, slumping or failure.	• >80% of bank network stable. • No evidence of bank sloughing, slumping or failure.
	• Stream bend areas highly unstable. • Outer bank height 1.2 m above stream (2.1 m above stream for large mainstem areas). • Overhang >0.8–1.0 m.	• Stream bend areas unstable. • Outer bank height 0.9–1.2 m above stream (1.5–2.1 m above stream for large mainstem areas). • Bank overhang 0.8–0.9 m.	• Stream bend areas stable. • Outer bank height 0.6–0.9 m above stream bank (1.2–1.5 m above stream bank for large mainstem areas). • Overhang 0.6–0.8 m.	• Stream bend areas very stable. • Height <0.6 m above stream (<1.2 m above stream for large mainstem areas). • Bank overhang <0.6 m.
	• Young exposed tree roots abundant. • >6 recent large tree falls per stream mile.	• Young exposed tree roots common. • 4–5 recent (large) tree falls per stream mile.	• Exposed tree roots predominately old and large, smaller young roots scarce. • 2–3 recent (large) tree falls per stream mile.	• Exposed tree roots old, large and woody. • Generally 0–1 recent (large) tree falls per stream mile.
	• Bottom 1/3 of bank is highly erodible material • Plant/soil matrix severely compromised.	• Bottom 1/3 of bank is generally highly erodible material • Plant/soil matrix compromised.	• Bottom 1/3 of bank is generally highly resistant plant/soil matrix or material.	• Bottom 1/3 of bank is generally highly resistant plant/soil matrix or material.
	• Channel cross-section is generally trapezoidally-shaped.	• Channel cross-section is generally trapezoidally-shaped.	• Channel cross-section is generally V- or U-shaped	• Channel cross-section is generally V- or U-shaped
Point Range	0 1 2	3 4 5	6 7 8	9 10 11

Evaluation Category	Poor	Fair	Good	Excellent
Channel Scouring / Sediment Deposition	• >75% embedded (>85% embedded for large mainstem areas).	• 50–75% embedded (60–85% embedded for large mainstem areas).	• 25–49% embedded (35-59% embedded for large mainstem areas).	• Riffle embeddness <25% sand-silt (<35% for large mainstem areas).
	• Few, if any, deep pools. • Pool substrate >81% sand-silt.	• Low to moderate number of deep pools. • Pool substrate 60–80% sand-silt.	• Moderate number of deep pools. • Pool substrate 30–59% sand-silt.	• High number of deep pools >61 cm (>122 cm for large mainstem areas). • Pool substrate <30% composed of sand-silt.
	• Streak marks and/or "banana" deposits common.	• Streak marks and/or "banana" deposits common.	• Streak marks and/or "banana" deposits uncommon.	• Streambed streak marks and/or banana-shaped sediment deposits absent.
	• Fresh, large sand deposits very common in channel. • Moderate to heavy sand deposition along major portion of overbank area very common.	• Fresh, large sand deposits in channel common. • Small localized areas of fresh sand deposits along top of low banks.	• Fresh, large sand deposits in channel uncommon. • Small localized areas of fresh sand deposits along top of low banks.	• Fresh, large sand deposits in channel rare or absent. • No evidence of fresh sediment deposition on overbank.
	• Point bars moderate to large and unstable with high amount of fresh sand present at most stream bends.	• Point bars moderate to large and unstable with high amount of fresh sand common.	• Point bars small and stable, well vegetated and/or armoured with little or no fresh sand.	• Point bars few, small and stable, well vegetated and/or armoured with little or no fresh sand.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Physical Instream Habitat	• Wetted perimeter <40% of bottom width (<45% for large mainstem areas).	• Wetted perimeter 40–60% of bottom width (45–65% for large mainstem areas).	• Wetted perimeter 61–85% of bottom width (66–90% for large mainstem areas).	• Wetted perimeter >85% of bottom channel width (>90% for large mainstem areas).
	• Dominated by one habitat type (usually runs) and by one velocity and depth condition (slow and shallow) (for large mainstem areas, few riffles present, runs and pools dominant, velocity and depth diversity low).	• Few pools present; riffles and runs dominant; velocity and depth generally slow and shallow (for large mainstem areas, runs and pools dominant, velocity and depth diversity intermediate).	• Good mix between riffles, runs and pools • Relatively diverse velocity and depth of flow.	• Riffles, runs and pool habitat present. • Diverse velocity and depth of flow present (i.e., slow, fast, shallow and deep water).
	• Riffle substrate composition predominately gravel with high percentage of sand. • <5% cobble.	• Riffle substrate composition predominately small cobble, gravel and sand. • 5–24% cobble.	• Riffle substrate composition has good mix of gravel, cobble and rubble material. • 25-49% cobble.	• Riffle substrate composition: cobble, gravel, rubble, boulder mix with little sand. • >50% cobble.
	• Riffle depth <10 cm for large mainstem area.	• Riffle depth 10–15 cm for large mainstem area.	• Riffle depth 15–20 cm for large mainstem areas.	• Riffle depth >8% for large 20 cm mainstem areas.
	• Large pools generally <30 cm deep (<61 cm for large mainstem areas) and devoid of cover/structure.	• Large pools generally 30–46 cm deep (61–91 cm for large mainstem areas) with little or no cover/structure.	• Large pools generally 46–61 cm deep (91–122 cm for large mainstem areas) with some cover/structure.	• Large pools generally >61 cm deep (>122 cm for large mainstem areas) with good overhead cover/structure
	• Extensive channel alteration or point bar formation/enlargement.	• Moderate increase in point bar and/or in amount of channel modification.	• Slight increase in point bar formation/enlargement or slight amount of channel modification.	• No channel alteration or significant point bar formation or enlargement.
	• Riffle/pool ratio: 0.49:1<; >1.51:1	• Riffle/pool ratio: 0.5–0.69:1; 1.31-1.5:1.	• Riffle/pool ratio: 0.9–0.89:1; 1.11–1.3:1.	• Riffle/pool ratio: 0.9–1.1:1.
	• Summer afternoon H_20 temp >80°F.	• Summer afternoon H_20 temp 75–80°F.	• Summer afternoon H_20 temp 68–75°F.	• Summer afternoon H_20 temp <68°F.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Water Quality	• Substrate fouling level: High (>50%).	• Substrate fouling level: Moderate (21–50%).	• Substrate fouling level: Very Light (11–20%).	• Substrate fouling level: 0–10% (rock underside).
	• TDS: >150 mg/L; Brown.	• TDS: 101–150 mg/L; Grey.	• TDS: 50–100 mg/L; Slightly Grey.	• TDS: <50 mg/L; Clear Flow.
	• Objects visible to depth <0.15 m below surface.	• Objects visible to depth 0.15–0.5 m below surface.	• Objects visible to depth 0.5–1 m below surface.	• Clear water – objects visible to depth >1 m below surface.
	• Moderate to strong organic odour.	• Slight to moderate odour.	• Slight organic odour.	• No odour.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Riparian Habitat Conditions	• Riparian area mostly non-woody vegetation. • Narrow riparian area.	• Riparian area predominantly wooded but with major localized gaps.	• Forested buffer generally >31 m wide along major portion of both banks.	• Wide (>60 m) mature forested buffer along both banks.
	• Canopy coverage: <50% shading (30% for large mainstem areas).	• Canopy coverage: 50–60% shading (30–44% for large mainstem areas).	• Canopy coverage: 60–79% shading (45–59% for large mainstem areas).	• Canopy coverage: >80% shading (>60% for large mainstem areas).
Point Range	0 1	2 3	4 5	6 7

Source: Galli, J. 1996. Rapid stream assessment technique, field methods. Metropolitan Washington Council of Governments. 36pp.

Total Overall Score (0–42): 18

Ranking: ☐ Poor (<13) ☑ Fair (13–24) ☐ Good (25–34) ☐ Excellent (35–42)

Recorded by

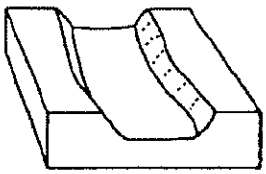
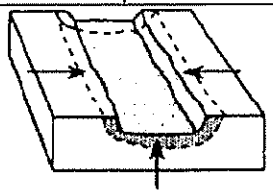
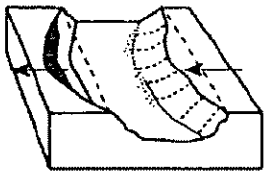
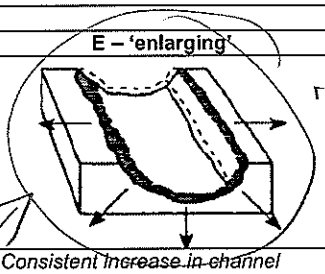
BEACON ENVIRONMENTAL

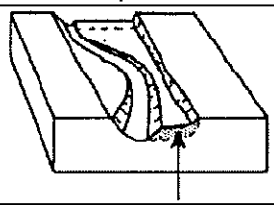
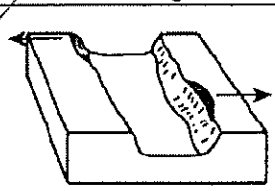
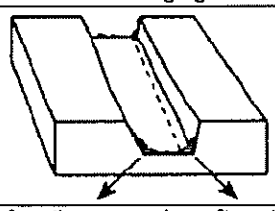
Geomorphology Group
Down's (1995) Model

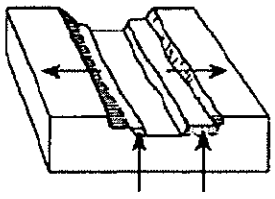
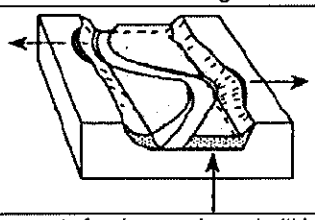
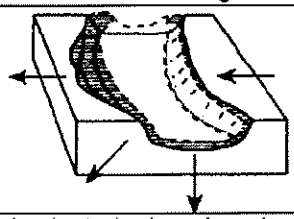
Date: Nov 21/18 **Project:** 218416

Weather: Sunny 1°C **Watercourse:** Appleby Ck

Location: Burlington **Reach:** AC-1

S – 'stable'	D – 'depositional'	M – 'lateral migration'	E – 'enlarging'
			
No observable morphological adjustment in process	***Consistent** decrease in channel width and/or depth*	*Migration of **most** bends; cross-sectional dimensions preserved*	*Consistent increase in channel width and/or depth*
☐ no bank slumping/failure/undercutting	☐ sediment deposition on bed (e.g. bar development, shadow deposits, high embeddedness)	☐ erosion along **outer bank** (e.g. slumping, young tree roots exposed, tree falls, undercutting)	☐ erosion along **both** banks (e.g. slumping, young tree roots exposed, tree falls)
☐ old tree roots exposed	☐ sediment deposited along banks	☐ deposition along **inner bank** (i.e. point bar development)	☐ no bar formation, scoured bed, low embeddedness
☐ no tree falls	☐ no bank erosion	☐ no alluvial terrace	☐ no alluvial terrace
☐ no alluvial terrace	☐ no alluvial terrace		

d – 'depositional'	m – 'lateral migration'	e – 'enlarging'
		
Selective deposition resulting in reduced channel width	*Initiation of alternating bank erosion in straightened channels or migration of only sharpest bends*	*Initiation of continuous erosion, **often** at channel toe*
☐ low-flow channel between outer banks/valley walls	☐ generally straight	☐ channel downcutting (e.g. bed scour, low embeddedness)
☐ alluvial terrace/valley wall	☐ stable except at sharp bends	☐ steep, high banks above bankfull level
☐ valley wall contacts at **few, if any** meander bends	☐ sharp bends with outside bank erosion, point-bar/cut bank development and undercutting	☐ no alluvial terrace
	☐ no alluvial terrace	

C – 'compound'	R – 'recovering'	U – 'undercutting'
		
Aggradation of channel bed with erosion of channel banks	*Development of a sinuous channel within straightened channel, including erosion of alternating valley walls*	*Active bed and outer bank erosion; migration of bend; coarse inner bank deposits*
☐ bank erosion (slumping, exposed tree roots)	☐ straight alluvial terrace/valley wall	☐ erosion along **outer bank** (e.g. slumping, young tree roots exposed, tree falls, undercutting)
☐ sediment deposition on bed (e.g. bar development, shadow deposits, high embeddedness)	☐ valley wall contact and erosion at **majority** of meander bends	☐ deposition along **inner bank** (i.e. point bar development)
☐ alluvial terrace with erosion		☐ scoured bed, low embeddedness, no bar formation
		☐ no alluvial terrace

Source: Downs, P.W. 1995. Estimating the probability of river channel adjustment. *Earth Surface Processes and Landforms.* **20**: 687-705.

Recorded by: SG

BEACON ENVIRONMENTAL

Geomorphology Group
Photos & Notes

Date: Nov 21/18 **Project:** 218416

Weather: sunny 1°C **Watercourse:** Appleby Ck

Location: Burlington **Reach:** Ac-1

Photo / WP #	Notes	Photo / WP #	Notes
173 805	d/s view pot. reach break (less entrenched)	182 820	d/s view, thalweg misalign & scour pool
173 806	u/s view from extent assessed general riffle conditions	183 821	u/s view exposed shale bank
174 807	d/s view - thalweg out of alignment	184 822	d/s view 2° channel / chute formation
175 808	u/s view undermined, outflank gabion	184 823	u/s view east culvert & storm outlet
176 809	u/s view hydraulic constriction, channel @ LB	184 824	u/s view west culvert & storm outlet
176 810	zoom in, u/s view gabion undermined		
176 811	d/s view basal scour & failing gabions		
177 812	d/s view from ped x-ing		
177 813	u/s view from ped x-ing		
178 814	d/s view gabion structure / CSP outflank? scour pool		
179 815	u/s view gabion wall RB undermined		
180 816	d/s view of riffle & gabion wall (RB)		
180 817	u/s view towards Fairview basal scour both side riffle		
181 818	u/s view lateral bar (shale)		
182 819	u/s view 2° channel at Fairview Rd		

Additional Notes:

Recorded by: SG

BEACON ENVIRONMENTAL

Geomorphology Group
Reach Characteristics

Date: Nov 21/18 **Project:** 218416

Weather: Sunny 1°C **Watercourse:** Appleby Ck

Location: Burlington oval Court **Reach:** AC-2

Land Use	☐ Forest	☐ Agricultural	☐ Residential	☐ Reach Break	
	☐ Pasture/Meadow	☑ Industrial/Commercial	☐ Other:		
Valley/Stream Type	☐ Unconfined	☐ Confined	☐ Partially Confined:		
	☑ Perennial	☐ Intermittent	☐ Ephemeral	☐ Reach Break	
Riparian Vegetation	Vegetation Type: ☑ Trees	☑ Shrubs	☑ Grasses	☐ Reach Break	
	☑ Herbaceous	Dominant Type:			
	Buffer Zone: ☐ None	☐ Fragmented	☑ Continuous		
	☐ <1 Channel Width	☑ 1-5 Channel Widths	☐ >5 Channel Widths		
	Age Class: ☐ Immature (<5 y.)	☐ Established (5-30 y.)	☐ Mature (>30 y.)		

Channel Characteristics

Planform	Sinuosity: ☑ Low	☐ Moderate	☐ High	☐ Reach Break	
	Gradient: ☐ Low	☑ Moderate	☐ High		
	Entrenchment: ☐ Low	☑ Moderate	☑ High		
	Riffle-Pool Spacing: 5-10 m	Meander Amplitude: N/A			
Bank	Angle: ☐ 0° - 30°	☐ 30° - 60°	☑ 60° - 90°	Undercut: 0.25	
	Erosion: ☐ <5%	☐ 5 – 30%	☐ 30 – 60%	☑ 60 – 100%	
	Failure: ☐ None	☐ Slump	☐ Planar	☑ Mass	
	Material: ☑ Clay/silt	☑ Sand	☐ Gravel	☐ Cobble	
	☐ Boulder	☐ Other:			
Channel	Riffle Substrate ☐ Clay/silt	☐ Sand	☑ Gravel	☑ Cobble	
	☑ Boulder	☑ Other: Shale	Riffle Embeddedness: 5-25 %		
	Pool Substrate ☑ Clay/silt	☑ Sand	☑ Gravel	☑ Cobble	
	☐ Boulder	☑ Other: till			

	Riffles			Pools			
Bankfull Width (m)	5.5	5.5	7.0	4.75	6.0	5.25	7.0
Bankfull Depth (m)	0.50	0.40	0.35	1.0	0.65	0.75	0.70
Wetted Width (m)	3.0	4.0	4.25	3.75	3.75	3.75	4.5
Wetted Depth (m)	0.15	0.18	0.07	0.55	0.20	0.35	0.35

Aquatic / Instream	Vegetation: ☐ Emergent	☐ Submergent	☐ Floating	Portion (%): 0	
	Woody Debris: ☐ Not Present	☐ Present in Cutbank	☑ Present in Channel	Density: Low/(Mod)/High	
Turbidity	☑ Clear	☐ Slight	☐ Moderate	☐ High	

Recorded by: _____

BEACON ENVIRONMENTAL

Geomorphology Group
Rapid Geomorphic Assessment (RGA)

Date: Nov 21/18 **Project:** 218416 **Reach:** AC-2

PROCESS	GEOMORPHIC INDICATOR	PRESENT		SCORE
		No	Yes	
Aggradation	1. Lobate bar formation	✓		
	2. Coarse materials in riffles embedded	✓		
	3. Siltation in pools	✓	✓	
	4. Medial / lateral bar formation	✓	✓	
	5. Accretion on point bars	✓		
	6. Poor longitudinal sorting of bed materials	✓		
	7. Deposition in the overbank zone	✓		0.14
	Sum of Indices	✓	1	
Degradation	1. Exposed bridge/culvert footing(s)	✓		
	2. Exposed sanitary/storm sewer/pipeline	✓		
	3. Elevated stormwater outfall(s)	✓		
	4. Undermined gabion baskets/concrete aprons/crib walls		✓	
	5. Scour pool formation downstream of culvert/storm outfall		✓	
	6. Cut face on bar formations	✓		
	7. Head cutting due to knickpoint migration (shale)		✓	0.40
	8. Terrace cut through older bar material	✓		
	9. Suspended armour layer visible in bank	✓		
	10. Channel worn into undisturbed overburden/bedrock		✓	
	Sum of Indices			
Widening	1. Fallen/leaning trees/fence posts		✓	
	2. Occurrence of large organic debris		✓	
	3. Exposed tree roots		✓	
	4. Basal scour on inside meander bends		✓	
	5. Basal scour on both sides of channel through riffle		✓	
	6. Length of basal scour >50% through reach		✓	
	7. Gabion baskets/armourstone walls/etc. outflanked		✓	0.70
	8. Exposed length of previously buried pipe	✓		
	9. Fracture lines along top of bank/slumping banks	✓		
	10. Exposed building foundation	✓		
	Sum of Indices			
Planimetric Form Adjustment	1. Formation of chute(s)		✓	
	2. Single thread to multiple channel	✓		
	3. Evolution of pool-riffle form to low-bed relief form	✓		
	4. Cut-off channel(s)	✓		0.43
	5. Formation of island(s)	✓		
	6. Thalweg alignment out of phase with meander form		✓	
	7. Bar forms poorly formed/reworked/removed		✓	
	Sum of Indices		3	
Stability Index (SI)				0.42

Source: Ministry of the Environment. 2003. Stormwater Management Planning and Design Manual. Document # 4329e. Queen's Printer for Ontario, Ontario, Canada.

Classification:

☐ **In Regime** (≤ 0.20) ☐ **In Transition/Stressed** (0.21 – 0.40) ☑ **In Adjustment** (≥0.41)

Recorded by: SG

BEACON ENVIRONMENTAL

Geomorphology Group
Rapid Stream Assessment Technique (RSAT)

Date: Nov 21/18 **Project:** 218116

Weather: sunny 1°C **Watercourse:** Appleby Creek

Location: Burlington Oval Court **Reach:** AC-2

Evaluation Category	Poor	Fair	Good	Excellent
Channel Stability	• <50% of bank network stable. • Recent bank sloughing, slumping or failure frequently observed.	• 50–70% of bank network stable. • Recent signs of bank sloughing, slumping or failure fairly common.	• 71–80% of bank network stable. • Infrequent signs of bank sloughing, slumping or failure.	• >80% of bank network stable. • No evidence of bank sloughing, slumping or failure.
	• Stream bend areas highly unstable. • Outer bank height 1.2 m above stream (2.1 m above stream for large mainstem areas). • Overhang >0.8–1.0 m.	• Stream bend areas unstable. • Outer bank height 0.9–1.2 m above stream (1.5–2.1 m above stream for large mainstem areas). • Bank overhang 0.8–0.9 m.	• Stream bend areas stable. • Outer bank height 0.6–0.9 m above stream bank (1.2–1.5 m above stream bank for large mainstem areas). • Overhang 0.6–0.8 m.	• Stream bend areas very stable. • Height <0.6 m above stream (<1.2 m above stream for large mainstem areas). • Bank overhang <0.6 m.
	• Young exposed tree roots abundant. • >6 recent large tree falls per stream mile.	• Young exposed tree roots common. • 4–5 recent (large) tree falls per stream mile.	• Exposed tree roots predominately old and large, smaller young roots scarce. • 2–3 recent (large) tree falls per stream mile.	• Exposed tree roots old, large and woody. • Generally 0–1 recent (large) tree falls per stream mile.
	• Bottom 1/3 of bank is highly erodible material • Plant/soil matrix severely compromised.	• Bottom 1/3 of bank is generally highly erodible material • Plant/soil matrix compromised.	• Bottom 1/3 of bank is generally highly resistant plant/soil matrix or material.	• Bottom 1/3 of bank is generally highly resistant plant/soil matrix or material.
	• Channel cross-section is generally trapezoidally-shaped.	• Channel cross-section is generally trapezoidally-shaped.	• Channel cross-section is generally V- or U-shaped	• Channel cross-section is generally V- or U-shaped
Point Range	0 1 2	3 4 5	6 7 8	9 10 11

Evaluation Category	Poor	Fair	Good	Excellent
Channel Scouring / Sediment Deposition	• >75% embedded (>85% embedded for large mainstem areas).	• 50–75% embedded (60–85% embedded for large mainstem areas).	• 25–49% embedded (35-59% embedded for large mainstem areas).	• Riffle embeddness <25% sand-silt (<35% for large mainstem areas).
	• Few, if any, deep pools. • Pool substrate >81% sand-silt.	• Low to moderate number of deep pools. • Pool substrate 60–80% sand-silt.	• Moderate number of deep pools. • Pool substrate 30–59% sand-silt.	• High number of deep pools >61 cm (>122 cm for large mainstem areas). • Pool substrate <30% composed of sand-silt.
	• Streak marks and/or "banana" deposits common.	• Streak marks and/or "banana" deposits common.	• Streak marks and/or "banana" deposits uncommon.	• Streambed streak marks and/or banana-shaped sediment deposits absent.
	• Fresh, large sand deposits very common in channel. • Moderate to heavy sand deposition along major portion of overbank area very common.	• Fresh, large sand deposits in channel common. • Small localized areas of fresh sand deposits along top of low banks.	• Fresh, large sand deposits in channel uncommon. • Small localized areas of fresh sand deposits along top of low banks.	• Fresh, large sand deposits in channel rare or absent. • No evidence of fresh sediment deposition on overbank.
	• Point bars moderate to large and unstable with high amount of fresh sand present at most stream bends.	• Point bars moderate to large and unstable with high amount of fresh sand common.	• Point bars small and stable, well vegetated and/or armoured with little or no fresh sand.	• Point bars few, small and stable, well vegetated and/or armoured with little or no fresh sand.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Physical Instream Habitat	• Wetted perimeter <40% of bottom width (<45% for large mainstem areas).	• Wetted perimeter 40–60% of bottom width (45–65% for large mainstem areas).	• Wetted perimeter 61–85% of bottom width (66–90% for large mainstem areas).	• Wetted perimeter >85% of bottom channel width (>90% for large mainstem areas).
	• Dominated by one habitat type (usually runs) and by one velocity and depth condition (slow and shallow) (for large mainstem areas, few riffles present, runs and pools dominant, velocity and depth diversity low).	• Few pools present; riffles and runs dominant; velocity and depth generally slow and shallow (for large mainstem areas, runs and pools dominant, velocity and depth diversity intermediate).	• Good mix between riffles, runs and pools • Relatively diverse velocity and depth of flow.	• Riffles, runs and pool habitat present. • Diverse velocity and depth of flow present (i.e., slow, fast, shallow and deep water).
	• Riffle substrate composition predominately gravel with high percentage of sand. • <5% cobble.	• Riffle substrate composition predominately small cobble, gravel and sand. • 5–24% cobble.	• Riffle substrate composition has good mix of gravel, cobble and rubble material. • 25-49% cobble.	• Riffle substrate composition: cobble, gravel, rubble, boulder mix with little sand. • >50% cobble.
	• Riffle depth <10 cm for large mainstem area.	• Riffle depth 10–15 cm for large mainstem area.	• Riffle depth 15–20 cm for large mainstem areas.	• Riffle depth >8% for large 20 cm mainstem areas.
	• Large pools generally <30 cm deep (<61 cm for large mainstem areas) and devoid of cover/structure.	• Large pools generally 30–46 cm deep (61–91 cm for large mainstem areas) with little or no cover/structure.	• Large pools generally 46–61 cm deep (91–122 cm for large mainstem areas) with some cover/structure.	• Large pools generally >61 cm deep (>122 cm for large mainstem areas) with good overhead cover/structure
	• Extensive channel alteration or point bar formation/enlargement.	• Moderate increase in point bar and/or in amount of channel modification.	• Slight increase in point bar formation/enlargement or slight amount of channel modification.	• No channel alteration or significant point bar formation or enlargement.
	• Riffle/pool ratio: 0.49:1<; >1.51:1	• Riffle/pool ratio: 0.5–0.69:1; 1.31-1.5:1.	• Riffle/pool ratio: 0.9–0.89:1; 1.11–1.3:1.	• Riffle/pool ratio: 0.9–1.1:1.
	• Summer afternoon H_20 temp >80°F.	• Summer afternoon H_20 temp 75–80°F.	• Summer afternoon H_20 temp 68–75°F.	• Summer afternoon H_20 temp <68°F.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Water Quality	• Substrate fouling level: High (>50%).	• Substrate fouling level: Moderate (21–50%).	• Substrate fouling level: Very Light (11–20%).	• Substrate fouling level: 0–10% (rock underside).
	• TDS: >150 mg/L; Brown.	• TDS: 101–150 mg/L; Grey.	• TDS: 50–100 mg/L; Slightly Grey.	• TDS: <50 mg/L; Clear Flow.
	• Objects visible to depth <0.15 m below surface.	• Objects visible to depth 0.15–0.5 m below surface.	• Objects visible to depth 0.5–1 m below surface.	• Clear water – objects visible to depth >1 m below surface.
	• Moderate to strong organic odour.	• Slight to moderate odour.	• Slight organic odour.	• No odour.
Point Range	0 1 2	3 4	5 6	7 8

Evaluation Category	Poor	Fair	Good	Excellent
Riparian Habitat Conditions	• Riparian area mostly non-woody vegetation. • Narrow riparian area.	• Riparian area predominantly wooded but with major localized gaps.	• Forested buffer generally >31 m wide along major portion of both banks.	• Wide (>60 m) mature forested buffer along both banks.
	• Canopy coverage: <50% shading (30% for large mainstem areas).	• Canopy coverage: 50–60% shading (30–44% for large mainstem areas).	• Canopy coverage: 60–79% shading (45–59% for large mainstem areas).	• Canopy coverage: >80% shading (>60% for large mainstem areas).
Point Range	0 1	2 3	4 5	6 7

Source: Galli, J. 1996. Rapid stream assessment technique, field methods. Metropolitan Washington Council of Governments. 36pp.

Total Overall Score (0–42): 14.5

Ranking: ☐ Poor (<13) ☑ Fair (13–24) ☐ Good (25–34) ☐ Excellent (35–42)

Recorded by SGS

BEACON ENVIRONMENTAL

Geomorphology Group
Photos & Notes

Date: Nov 21/18 **Project:** 218416

Weather: Sunny 19C **Watercourse:** Appleby Ck

Location: Burlington Oval Court **Reach:** AC-2

Photo / WP #	Notes	Photo / WP #	Notes
185 825	2° channel/chute uls view gabion weir ~0.6 east culvert	195 840	uls view gabion (LB)
185 826	uls view 2° channel/chute at west culvert	196 841	uls view shale cascade
186 827	west channel pool (exp till) Wb=3.5m WW=2.25m dp=0.15 dW=0.42	196 842	dls view gabion & undercut bank ~0.25m
187 828	uls view debris jam & 2° flow path / RP	197 843	dls view debris & cascade at gabion wall
188 829	dls view debris jam	197 844	dls view - basal scour at riffle
189 830	dls view pool - channel entrenched	197 845	uls view undermined gabion
189 831	uls view gabion wall (RB) undermined/undercut	198 846	uls view till cascade & GO outfall
189 832	zoom in @ gabion	198 847	dls view from outfall undermined gabion
190 833	uls view basal scour both sides riffle	198 848	zoom in GO outfall
191 834	dls view lateral bar - shale	199 849	dls view - gabion wall at GO1 of (RB)
191 835	apparent storm outlet (LB)	200 850	uls view rock revet & riffle
192 836	dls view exposed shale face	201 851	dls view riffle
192 837	uls view shale cascade ~0.30m	202 852	uls view exposed shale face
193 838	uls view general riffle condition	203 853	dls view exposed shale face at fence line
194 839	uls view exposed shale face	204 854	uls view GO crossing

Additional Notes:

Recorded by: SG

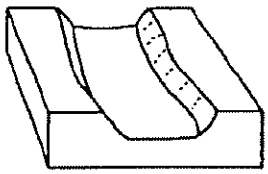
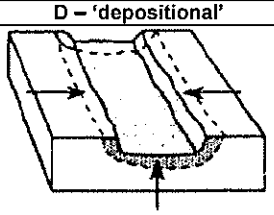
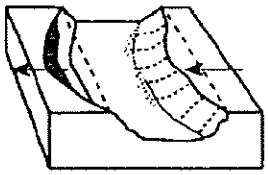
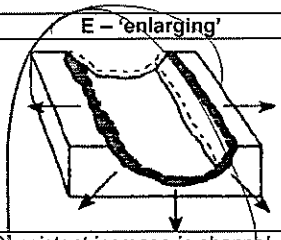
BEACON ENVIRONMENTAL

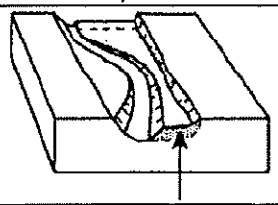
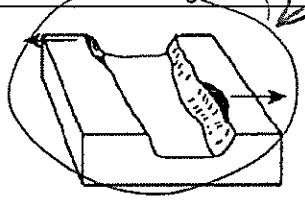
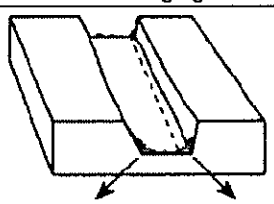
Geomorphology Group
Down's (1995) Model

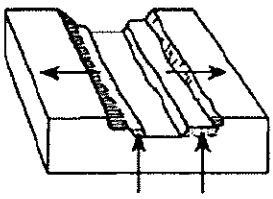
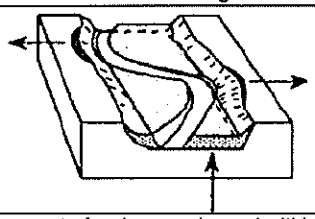
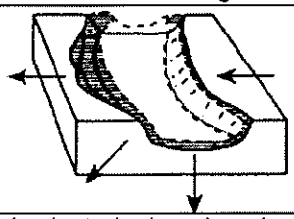
Date: Nov 21/18 **Project:** 218416

Weather: Sunny 1°C **Watercourse:** Appleby Ck

Location: Burlington Oval Court **Reach:** AC-2

S – 'stable'	D – 'depositional'	M – 'lateral migration'	E – 'enlarging'
			
No observable morphological adjustment in process	***Consistent** decrease in channel width and/or depth*	*Migration of **most** bends; cross-sectional dimensions preserved*	*Consistent increase in channel width and/or depth*
☐ no bank slumping/failure/undercutting ☐ old tree roots exposed ☐ no tree falls ☐ no alluvial terrace	☐ sediment deposition on bed (e.g. bar development, shadow deposits, high embeddedness) ☐ sediment deposited along banks ☐ no bank erosion ☐ no alluvial terrace	☐ erosion along **outer bank** (e.g. slumping, young tree roots exposed, tree falls, undercutting) ☐ deposition along **inner bank** (i.e. point bar development) ☐ no alluvial terrace	☐ erosion along **both** banks (e.g. slumping, young tree roots exposed, tree falls) ☐ no bar formation, scoured bed, low embeddedness ☐ no alluvial terrace

d – 'depositional'	m – 'lateral migration'	e – 'enlarging'
		
Selective deposition resulting in reduced channel width	*Initiation of alternating bank erosion in straightened channels or migration of only sharpest bends*	*Initiation of continuous erosion, **often** at channel toe*
☐ low-flow channel between outer banks/valley walls ☐ alluvial terrace/valley wall ☐ valley wall contacts at **few, if any** meander bends	☐ generally straight ☐ stable except at sharp bends ☐ sharp bends with outside bank erosion, point-bar/cut bank development and undercutting ☐ no alluvial terrace	☐ channel downcutting (e.g. bed scour, low embeddedness) ☐ steep, high banks above bankfull level ☐ no alluvial terrace

C – 'compound'	R – 'recovering'	U – 'undercutting'
		
Aggradation of channel bed with erosion of channel banks	*Development of a sinuous channel within straightened channel, including erosion of alternating valley walls*	*Active bed and outer bank erosion; migration of bend; coarse inner bank deposits*
☐ bank erosion (slumping, exposed tree roots) ☐ sediment deposition on bed (e.g. bar development, shadow deposits, high embeddedness) ☐ alluvial terrace with erosion	☐ straight alluvial terrace/valley wall ☐ valley wall contact and erosion at **majority** of meander bends	☐ erosion along **outer bank** (e.g. slumping, young tree roots exposed, tree falls, undercutting) ☐ deposition along **inner bank** (i.e. point bar development) ☐ scoured bed, low embeddedness, no bar formation ☐ no alluvial terrace

Source: Downs, P.W. 1995. Estimating the probability of river channel adjustment. *Earth Surface Processes and Landforms*. **20**: 687-705.

Recorded by: SG

Amphibian Data Form

BEACON ENVIRONMENTAL

Visit Information

Project Name: Oval Court
Project #: 218416
Observer Name: A. Corrigan + G. Coker
Visit #: 1
Date: April 22 2019
Cloud Cover (%): 70%
Temperature (°C): 11°C
Beaufort Wind Scale (0-6): 0
Precipitation (check one): ☒ None/Dry ☐ Damp/Haze/Fog ☐ Drizzle ☐ Rain

Call Level Codes

Code 1: Calls not simultaneous, number of individuals can be accurately counted.

Code 2: Some calls simultaneous, number of individuals can be reliably estimated.

Code 3: Full chorus, call continuous and overlapping, number of individuals cannot be reliably estimated.

Species	In*	Out**
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species is calling from inside 100-metre station area.
** Check if species is calling from outside 100-metre station area.

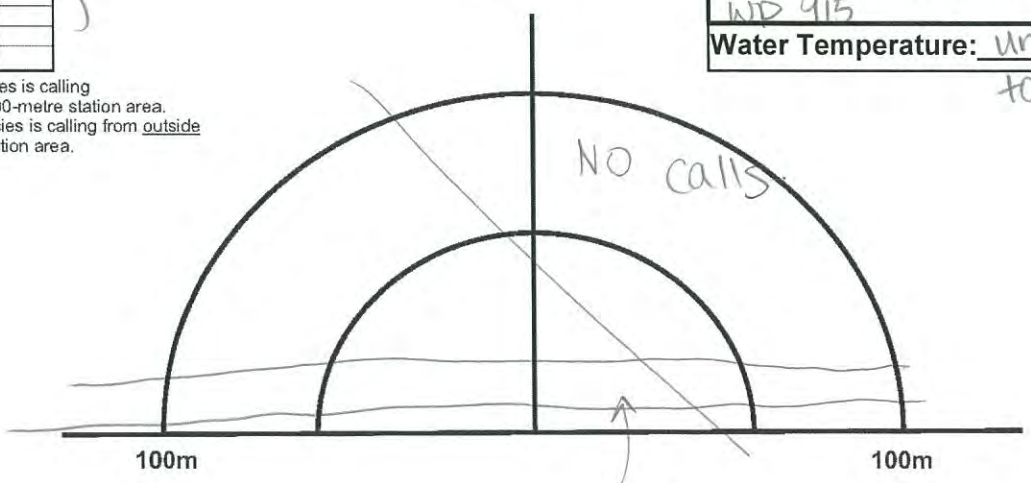
Station 1

Station Start Time (24 hr): 2210

Background Noise Code (1-4): 3

GPS Coordinates: 17T 600589 4803571 WP 915

Water Temperature: unsafe to collect

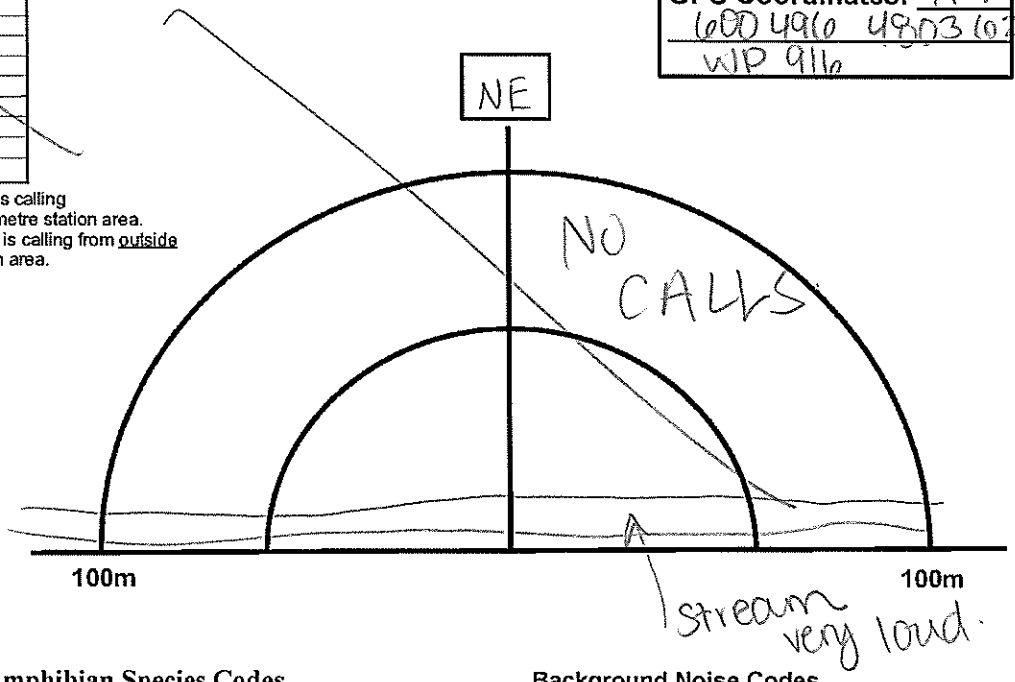


Species	In*	Out**
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species is calling from inside 100-metre station area.
** Check if species is calling from outside 100-metre station area.

Station 2

Station Start Time (24 hr):	2210
Background Noise Code (1-4):	3
GPS Coordinates:	17T 600 4910 4803 623 WP 916



Amphibian Species Codes

Species	Code
American Toad	AMTO
Northern (Blanchard's) Cricket Frog	BCFR
Bullfrog	BULL
Chorus Frog	CHFR
Cope's (Diploid) Gray Treefrog	CGTR
Fowler's Toad	FOTO
Gray (Tetraploid) Treefrog	GRTR
Green Frog	GRFR
Mink Frog	MIFR
Northern Leopard Frog	NLFR
Pickerel Frog	PIFR
Spring Peeper	SPPE
Wood Frog	WOFR

Background Noise Codes

Index	Description
0	No appreciable effect (e.g., owl calling)
1	Slightly affecting sampling (e.g., distant traffic, dog barking, car passing)
2	Moderately affecting sampling (e.g., distant traffic, 2-5 cars passing)
3	Seriously affecting sampling (e.g., continuous traffic nearby, 6-10 cars passing)
4	Profoundly affecting sampling (e.g., continuous traffic passing, construction noise)

24 Hour Time

12 Hour	*24 Hour*	*12 Hour*	*24 Hour*
7:00 PM	1900	10:00 PM	2200
8:00 PM	2000	11:00 PM	2300
9:00 PM	2100	12:00 PM	2400

Beaufort Wind Scale

Number	Wind Speed		Indicators
	Km/h	Mph	
0	0-2	0-1	**Calm**, smoke rises vertically
1	3-5	2-3	**Light air movement**, smoke drifts
2	6-11	4-7	**Slight breeze**, wind felt on face
3	12-19	8-12	**Gentle breeze**, leaves and small twigs in constant motion
4*	20-30	13-18	**Moderate breeze**, small branches are moving, raises dust and loose paper

* Winds over Beaufort 3 are unacceptable for amphibian surveys.

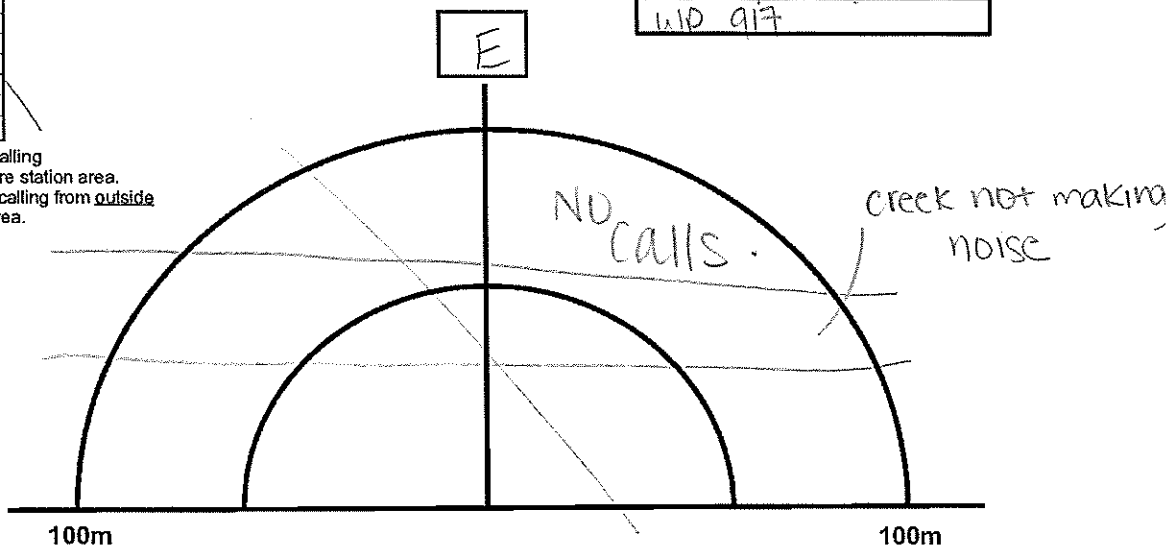
Species	In*	Out**
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species is calling from inside 100-metre station area.
** Check if species is calling from outside 100-metre station area.

Station 3

Station Start Time (24 hr):	2221
Background Noise Code (1-4):	3
GPS Coordinates:	17T 600419 4903724 NAD 917

bus nearby very loud



Amphibian Species Codes

Species	Code
American Toad	AMTO
Northern (Blanchard's) Cricket Frog	BCFR
Bullfrog	BULL
Chorus Frog	CHFR
Cope's (Diploid) Gray Treefrog	CGTR
Fowler's Toad	FOTO
Gray (Tetraploid) Treefrog	GRTR
Green Frog	GRFR
Mink Frog	MIFR
Northern Leopard Frog	NLFR
Pickerel Frog	PIFR
Spring Peeper	SPPE
Wood Frog	WOFR

Background Noise Codes

Index	Description
0	No appreciable effect (e.g., owl calling)
1	Slightly affecting sampling (e.g., distant traffic, dog barking, car passing)
2	Moderately affecting sampling (e.g., distant traffic, 2-5 cars passing)
3	Seriously affecting sampling (e.g., continuous traffic nearby, 6-10 cars passing)
4	Profoundly affecting sampling (e.g., continuous traffic passing, construction noise)

24 Hour Time

12 Hour	*24 Hour*	*12 Hour*	*24 Hour*
7:00 PM	1900	10:00 PM	2200
8:00 PM	2000	11:00 PM	2300
9:00 PM	2100	12:00 PM	2400

Beaufort Wind Scale

Number	Wind Speed		Indicators
	Km/h	Mph	
0	0-2	0-1	**Calm**, smoke rises vertically
1	3-5	2-3	**Light air movement**, smoke drifts
2	6-11	4-7	**Slight breeze**, wind felt on face
3	12-19	8-12	**Gentle breeze**, leaves and small twigs in constant motion
4*	20-30	13-18	**Moderate breeze**, small branches are moving, raises dust and loose paper

* Winds over Beaufort 3 are unacceptable for amphibian surveys.


Samuel Strapping Systems Group
740 Oval Court
AZX Sport
Zeton Inc
Airon Group of Companies
Branthaven Homes
Track 3 Platform - Appleby Go Train Station
Appleby
5111 Fairview St Parking
Fairview St
Oval Ct
Centennial Bikeway
Bridle Wood
Blue Forest Hill
Google

Amphibian Data Form

BEACON ENVIRONMENTAL

Visit Information

Project Name: Oval Court
Project #: 2184116
Observer Name: A. Corrigan + N. Collins
Visit #: 2
Date: May 27, 2019
Cloud Cover (%): 95
Air Temperature (°C): 17°C
Beaufort Wind Scale (0-6): 0
Precipitation (check one): ☒ None/Dry ☐ Damp/Haze/Fog ☐ Drizzle ☐ Rain

Call Level Codes

Code 1: Calls not simultaneous, number of individuals can be accurately counted.

Code 2: Some calls simultaneous, number of individuals can be reliably estimated.

Code 3: Full chorus, call continuous and overlapping, number of individuals cannot be reliably estimated.

Species	In*	Out**
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species is calling from inside 100-metre station area.
** Check if species is calling from outside 100-metre station area.

Station 1

NE

100m 100m

Station Start Time (24 hr): 22:24

Background Noise Code (1-4): 3

GPS Coordinates: see map.

Water Temp. (°C): /

Ls unable to safely collect (steep slopes)

* creek very loud - morning test

Species	In*	Out**
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species is calling from inside 100-metre station area.
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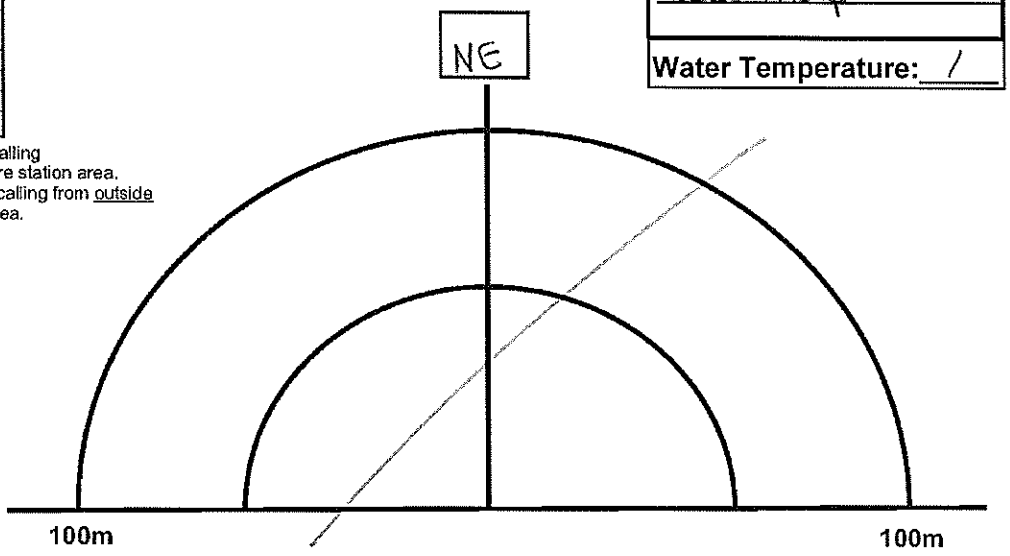
Station 2

Station Start Time (24 hr): 22:33

Background Noise Code (1-4): 3

GPS Coordinates: see map

Water Temperature: 1



Species	In*	Out**
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species is calling from inside 100-metre station area.
** Check if species is calling from outside 100-metre station area.

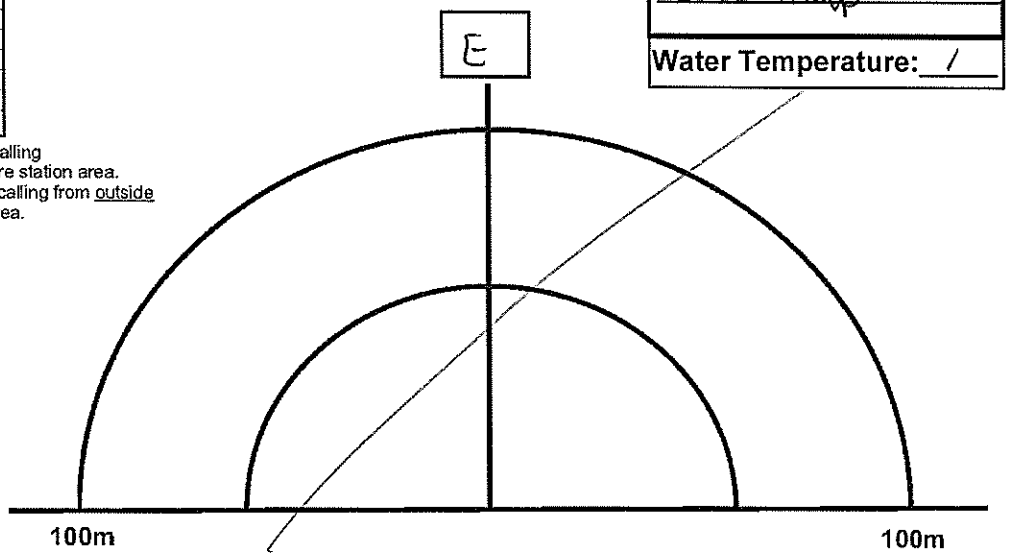
Station 3

Station Start Time (24 hr): 22:38

Background Noise Code (1-4): 4

GPS Coordinates: see map

Water Temperature: 1




Project: 218416
Project Manager: KU
Field Staff: AC
Date of Site Visit(s): May 27, 2014
Type of Data Collected: Amphibian Calling
Data Collected With: N. Collins
Notes: /
4803800
600300
4804000
4803700
600400
600300
4804000
600500
4803600
600600
600500
4803900
600700
600600
600800
4803500
600700
600900
4803500
600800
4803600
4803700
600900
1
2
3
Oval Court
Fairview Street
0 10 20 40 Metres
N
E
S
W

Page 3 of 3

Amphibian Data Form

BEACON ENVIRONMENTAL

Visit Information

Project Name: Oval Court	Project #: 218416
Observer Name: G. Coker D. Upper	Visit #: 3
Date: July 3 2019	Cloud Cover (%): 20
Air Temperature (°C): 22	Beaufort Wind Scale (0-6): 0

Precipitation (check one): ☒ None/Dry ☐ Damp/Haze/Fog ☐ Drizzle ☐ Rain

Call Level Codes

Code 1: Calls not simultaneous, number of individuals can be accurately counted.

Code 2: Some calls simultaneous, number of individuals can be reliably estimated.

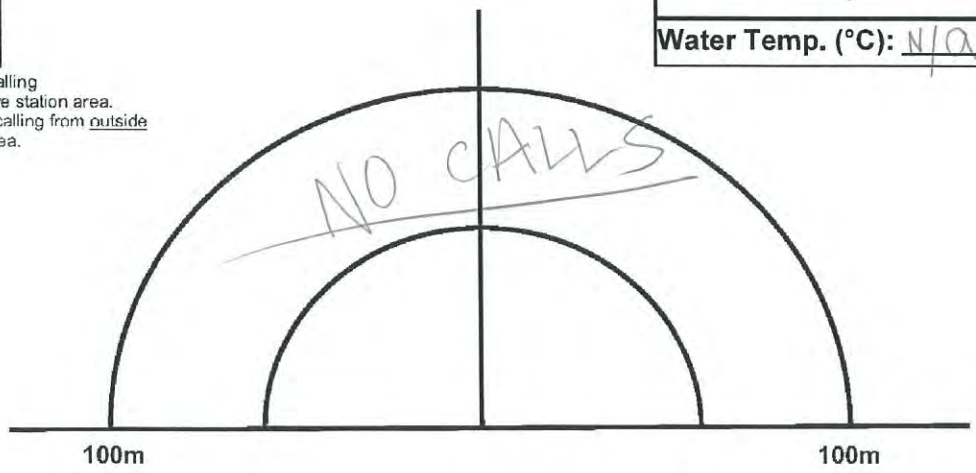
Code 3: Full chorus, call continuous and overlapping, number of individuals cannot be reliably estimated.

Species	In*	Out**
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species is calling from inside 100-metre station area.
** Check if species is calling from outside 100-metre station area.

Station ~~3~~ ~~NE~~

Station Start Time (24 hr):	11:09 pm
Background Noise Code (1-4):	2 – train
GPS Coordinates:	see map.
Water Temp. (°C):	N/A

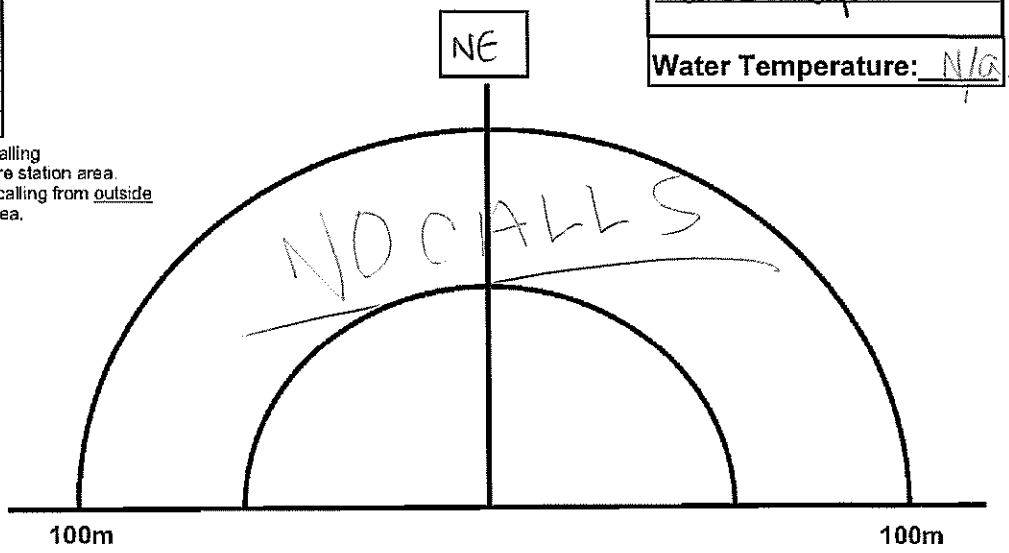


Species	In*	Out**
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species is calling from inside 100-metre station area.
** Check if species is calling from outside 100-metre station area.

Station 2

Station Start Time (24 hr):	11:12
Background Noise Code (1-4):	2
GPS Coordinates:	See map
Water Temperature:	N/A

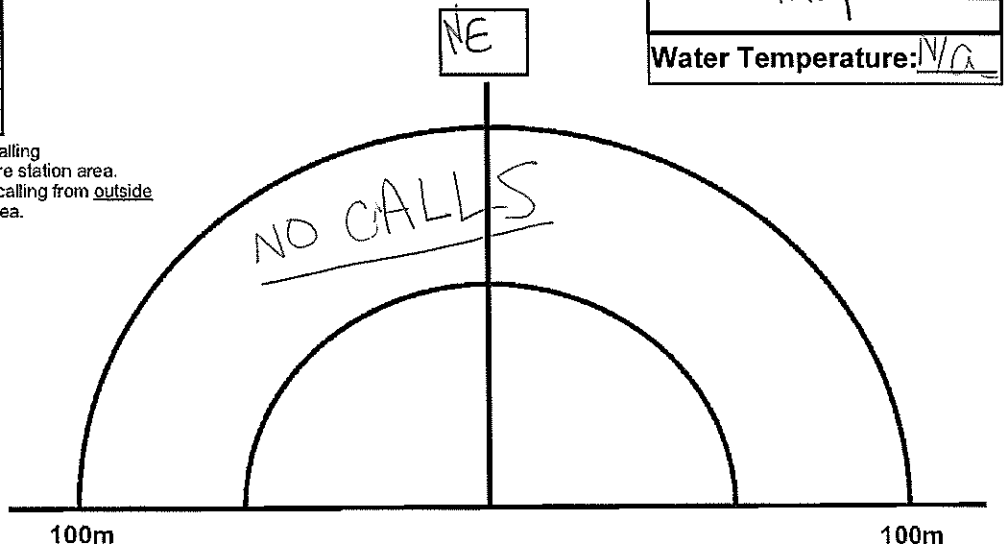


Species	In*	Out**
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

* Check if species is calling from inside 100-metre station area.
** Check if species is calling from outside 100-metre station area.

Station 3

Station Start Time (24 hr):	11:17
Background Noise Code (1-4):	2
GPS Coordinates:	See map.
Water Temperature:	N/A



July 3 2014
Amphibian Call Survey Rnd 3.
G. Coker D. Upper



Potential Maternity Roost
Snag Tree ID Form

CAGO AMGO Raccoon tracks
NOCA COGR E. Cottontail observed (3)
AMRO RWBB

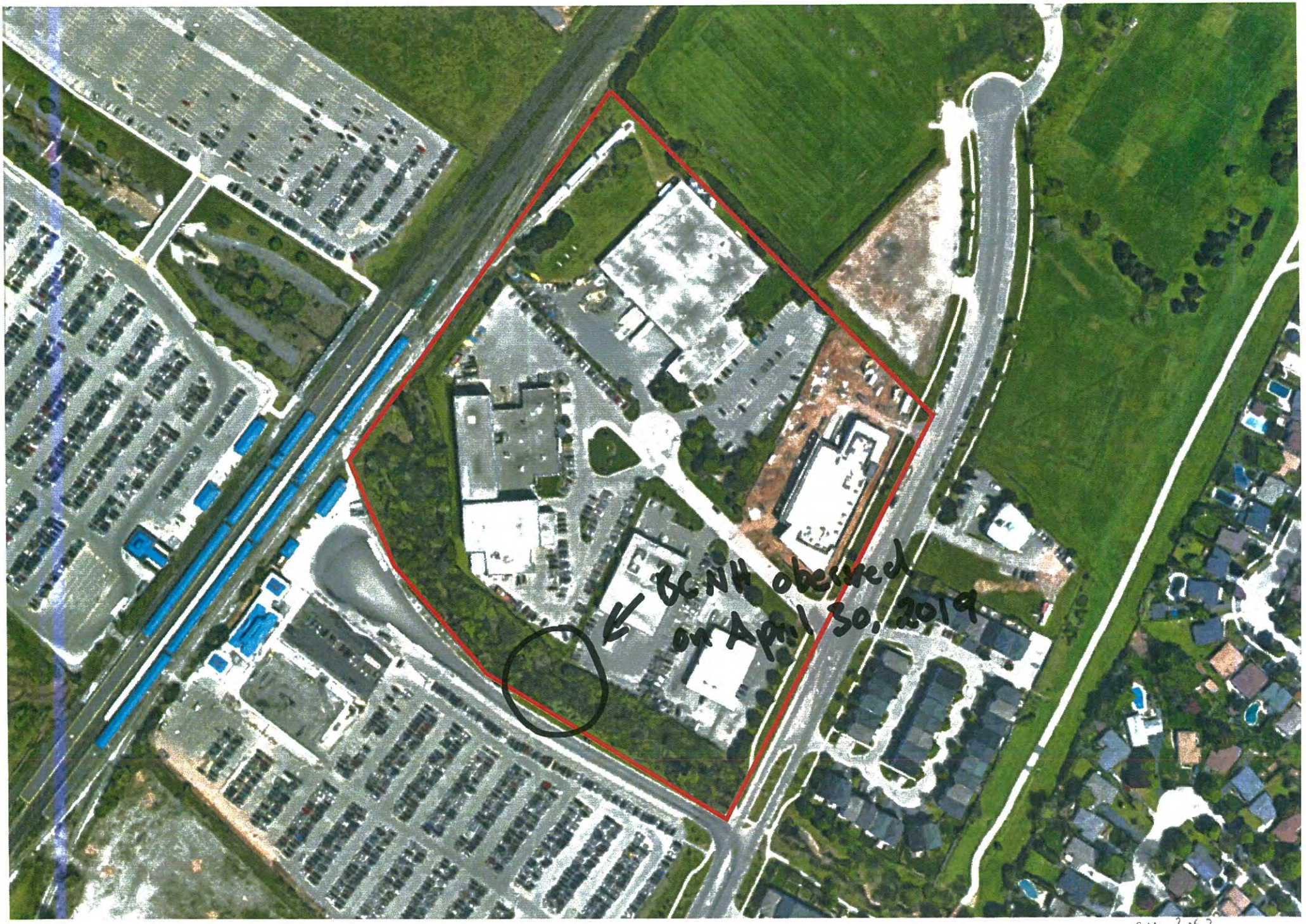
Surveyors: AC + NC Date: April 30, 2019
Weather: 9°C, Wind 1, CC 100%, no ppt
↓ 12°C ↓ 50%

10:30am - 4:30pm

Project: 218416
Page: 1 of 2

Plot #	Tree #	Species	# of Cavities	DBH (cm)	Cavity Height (m)	Tree Height (m)	% Loose Bark	Decay Class	Canopy Cover	# of Leaf Nests	UTM	Notes	Photos
✓	1	Green Ash	0	35	1	5-10	15%	2	25-50	0	WP 545	Tree 270	1
✓	2	Bur oak	0	11		5-10	0	1	25-50	1	WP 546	Tree 345	1
✓	3	Willow sp.	10+	100+	0-10	10-15	0	2	25-50	0	WP 547	Tree 94	4136
✓	4	Dead Snag	2	23	5-10	5-10	0	5	25-50	0	WP 548	Tree 399	1
✓	5	Green Ash	1	42/28/38/38	1	10-15	0-25%	3	25-50	0	WP 549	Crack, Tree 87	1
✓	6	Green Ash	1	36/34/24	1	10-15	0-25	3	25-50	0	WP 550	Tree 408	1
✓	7	Green Ash	1	37/38	1	10-15	0-25	2	50-75	0	WP 551	Tree 509	1
✓	8	Crack Willow	10+	40/45	0-10	5-10	0	2	75-100	0	WP 552	Tree 92	1
✓	9	Green Ash	1	42/40	1	10-15	0-25	3	75-100	0	WP 553	Tree 266	1

Black-crowned Night Heron observed in valley - see attached map


BCNH observed
on April 30, 2019

Potential Maternity Roost
Snag Tree ID Form

Surveyors: AC Date: May 29, 2018
Weather: 18-22°C, CC 80-100%, no ppt, wind 1-2

Project: 218416
Page: 1 of 1

ELC	Detector #	Species	Direction of Mic	Snag ID in vicnity	UTM	Notes	Photos
CUW	45	Green Ash	NW	553	Wp 924, 600598E, 4803569N	Tree 453	1
CUW	118	Black Walnut	SE	546, 547	Wp 926, 600476E, 4803663 N	Tree 348	2-3
CUW	114	Black Walnut	SE	551, 550	Wp 925, 600446E, 4803724N	Tree 402	4-5

Bat Detector Pick Up

July 3, 2019
A. Corrigan

Time -> 9:00 - 10:00 am
Weather -> 23°C, 50% CC, Wind 1, no ppt

Detector 118 + 114's mics were downed upon pick up.

All SD cards gathered data

Photo 1 -> 118
Photo 2 -> 114
Photo 3 -> 45

Rite in the Rain.

2

RL/AC



Burbury


Project: 218416
Project Manager: KU
Field Staff: AC, RFC
Date of Site Visit(s): July 3/19
Type of Data Collected: 8:15am - 9:00am
Data Collected With:
Notes: Weather: 23°C, wind 0/1 cloud 60% humid
Oval Court
Fairview Street
0 10 20 40 Metres
N
E
S
W
4803800
600300
4804000
600400
4803700
600500
4803600
600600
4803500
600700
600800
4803900
600900

BEACON ENVIRONMENTAL

Aquatic Field Investigations
Logger Installation & Monitoring

Date: Aug 1 2019
Weather: sunny 25°C.
Station: US
Waypoint #: 103

Project: 2184116
Watercourse: Appleby Creek
Reach: N/A

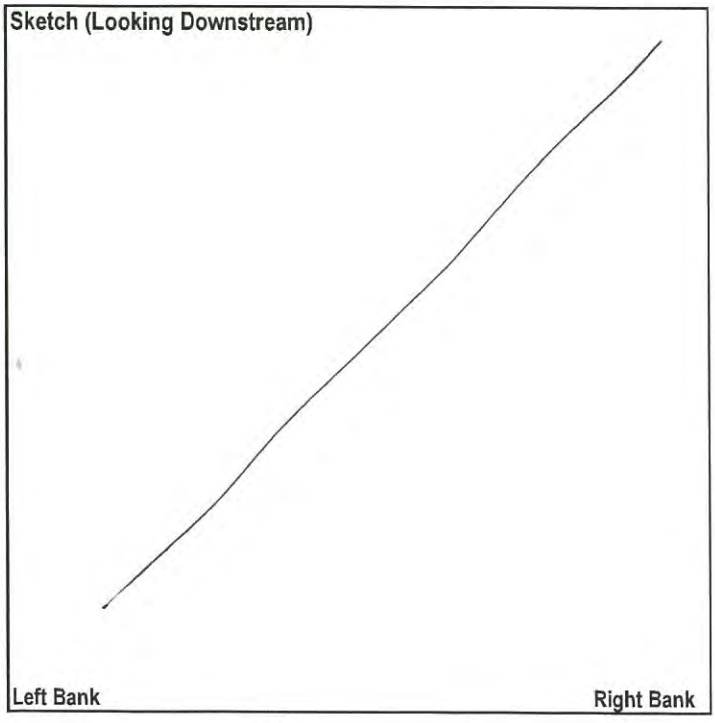
Type of Visit ☑ Installation ☐ Monitoring

Logger Installation
- Logger Type: ☐ Bar ☑ Temp ☐ Level
- Logger Number: 10862232
- Logging Interval (minutes): 15
- Waterbody Type: ☐ Pond ☐ Wetland ☑ Channel ☐ Other:
- Survey Method: ☐ RTK ☐ Total Station ☐ N/A
- Survey Point Elevations:
  - Water Level: ____ Channel Bed: ____
  - Top of Casing: ____

Field Measurements
- Time of Install / Inspection: 1:30
- Water Temperature (°C):
- Ambient Air Temperature (°C): 23°C ~~N/A~~ 25
- Air Pressure (kpa): N/A

Depth Measurements
- Water Depth (m):
- To Water Surface (m):
- To Channel Bed (m):
- Fouling Present: ☐ Yes ☑ No

Sketch (Looking Downstream)



Sediment Transport
- ☐ Observed ☐ Not Observed
- If Observed:
  - ☐ Suspended ☐ Sliding ☐ Rolling ☑ Saltation

Discharge
- ☐ Estimated: ____ m³/s
- ☐ Measured: ____ m³/s
- ☐ Other: ____

Photos and Notes

photos 2312-2314
- logger may need to be reinstalled in the future.

- no water depth was taken b/c no ruler

Field Crew: GC

Recorded by: GC.

BEACON ENVIRONMENTAL

Aquatic Field Investigations
Logger Installation & Monitoring

Date: Aug 1 2019
Weather: sunny
Station: DS
Waypoint #: 102

Project: 2184116
Watercourse: Appleby Creek
Reach: N/A

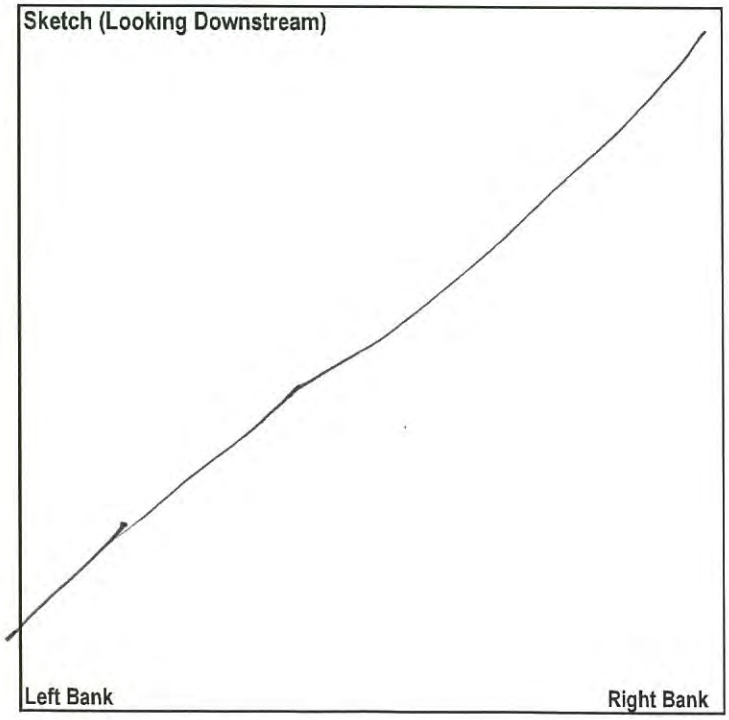
Type of Visit ☑ Installation ☐ Monitoring

Logger Installation
- Logger Type: ☐ Bar ☑ Temp ☐ Level
- Logger Number: 10862254
- Logging Interval (minutes): 15
- Waterbody Type: ☐ Pond ☐ Wetland ☑ Channel ☐ Other:
- Survey Method: ☐ RTK ☐ Total Station ☐ N/A
- Survey Point Elevations:
  - Water Level: Channel Bed:
  - Top of Casing:

Field Measurements
- Time of Install / Inspection: 12:42
- Water Temperature (°C): 22°C
- Ambient Air Temperature (°C): 25
- Air Pressure (kpa): N/a

Depth Measurements
- Water Depth (m):
- To Water Surface (m):
- To Channel Bed (m):
- Fouling Present: ☐ Yes ☐ No

Sketch (Looking Downstream)



Sediment Transport
- ☐ Observed ☐ Not Observed
- If Observed:
  - ☐ Suspended ☐ Sliding ☐ Rolling ☐ Saltation

Discharge
- ☐ Estimated: m^3/s
- ☐ Measured: m^3/s
- ☐ Other:

Photos and Notes

- air temp @ Bronte. (tableland)
- substrate bedrock so limited areas to put logger
- fish seen in creek

photos 2309 - 2311

- no water depth was taken b/c no ruler

Field Crew: GC

Recorded by: GC

BEACON ENVIRONMENTAL

Aquatic Field Investigations
Logger Installation & Monitoring

Date: Oct 29 2019
Weather: 10°C, 100%CC, No wind.
Station: DS Logger
Waypoint #: N/A

Project: 218416 Oval Court
Watercourse: Appleby Creek
Reach: N/A

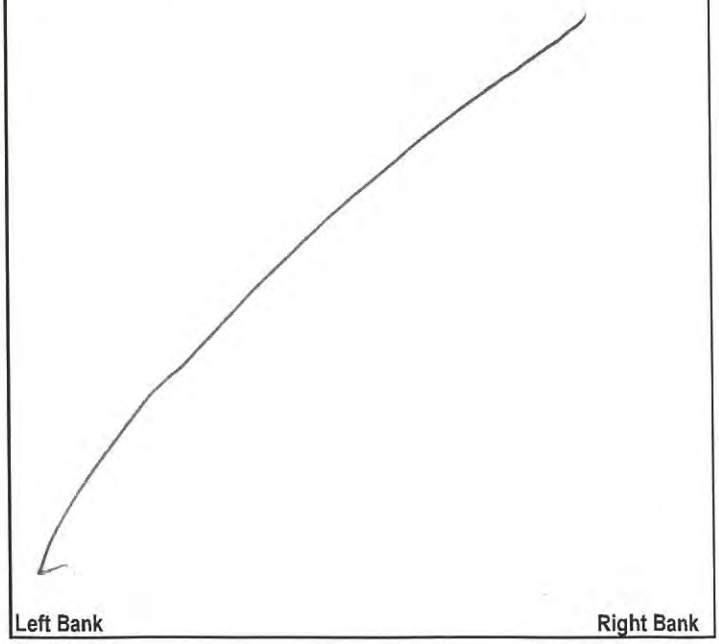
Type of Visit ☐ Installation ☐ Monitoring ☑ removal

Logger Installation
- Logger Type: ☐ Bar ☑ Temp ☐ Level
- Logger Number: see install notes
- Logging Interval (minutes): 15
- Waterbody Type: ☐ Pond ☐ Wetland ☑ Channel ☐ Other:
- Survey Method: ☐ RTK ☐ Total Station ☐ N/A
- Survey Point Elevations:
  - Water Level: ____ Channel Bed: ____
  - Top of Casing: ____

Field Measurements
- Time of Install / Inspection: 09:17
- Water Temperature (°C): 9.9°C
- Ambient Air Temperature (°C): ~10°C
- Air Pressure (kpa): N/A

Depth Measurements
- Water Depth (m): 0.335
- To Water Surface (m):
- To Channel Bed (m):
- Fouling Present: ☑ Yes ☐ No

Sketch (Looking Downstream)



Sediment Transport
- ☐ Observed ☐ Not Observed
- If Observed: ☐ Suspended ☐ Sliding ☐ Rolling ☐ Saltation

Discharge
- ☐ Estimated: ____ m^3/s
- ☐ Measured: ____ m^3/s
- ☐ Other: ____

Photos and Notes

Same notes as U/S logger.

Field Crew: JD

Recorded by: JD

BEACON ENVIRONMENTAL

Aquatic Field Investigations
Logger Installation & Monitoring

Date: Oct 29 2019
Weather: 10°C, 100%CC, No wind.
Station: US Logger
Waypoint #: N/A JD

Project: Oval Court
Watercourse: Appleby Creek
Reach: N/A

Type of Visit ☐ Installation ☐ Monitoring ☑ removal

Logger Installation
- Logger Type: ☐ Bar ☑ Temp ☐ Level
- Logger Number: See install notes
- Logging Interval (minutes): 15
- Waterbody Type: ☐ Pond ☐ Wetland ☑ Channel ☐ Other:
- Survey Method: ☐ RTK ☐ Total Station ☐ N/A
- Survey Point Elevations:
  - Water Level: ____ Channel Bed: ____
  - Top of Casing: ____

Field Measurements
- Time of Install / Inspection: 09:30
- Water Temperature (°C): 10.0°C
- Ambient Air Temperature (°C): ~10°C
- Air Pressure (kpa): ____

Depth Measurements
- Water Depth (m): 0.39
- To Water Surface (m): ____
- To Channel Bed (m): ____
- Fouling Present: ☑ Yes ☐ No

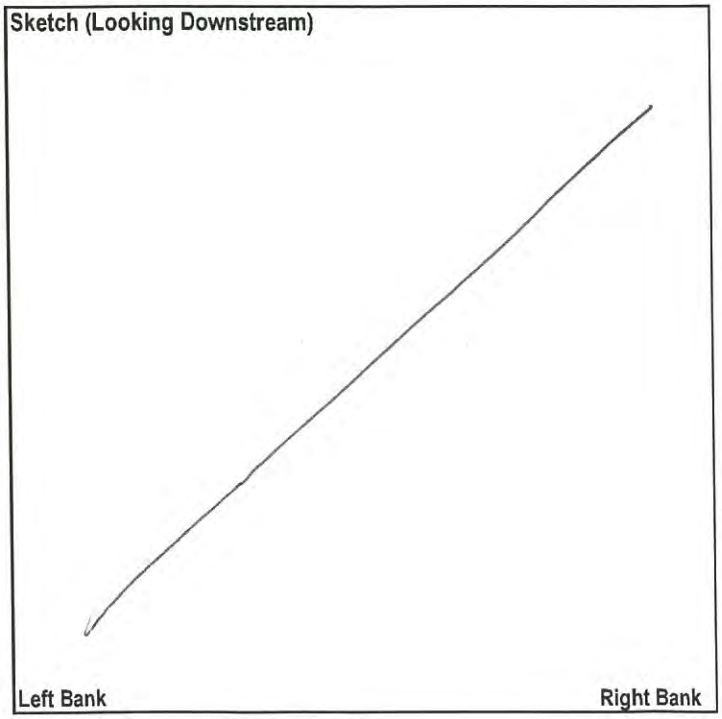
Sediment Transport
- ☐ Observed ☐ Not Observed
- If Observed: ☐ Suspended ☐ Sliding ☐ Rolling ☐ Saltation

Discharge
- ☐ Estimated: ____ m^3/s
- ☐ Measured: ____ m^3/s
- ☐ Other: ____

Photos and Notes

Heavy leaf litter debris build-up on outside of housing. Housing removed and logger retrieved during site visit.

Sketch (Looking Downstream)



Field Crew: JD

Recorded by: JD

Aquatic Habitat Assessment

BEACON ENVIRONMENTAL

Date: Aug 15 2019
Weather: sunny
Station: N/a
Waypoint #: ND WP but near Roager
Type of Assessment: ☐ Reach Based ☑ Transect # 1

Project: 218416.
Watercourse: Appleby Creek
Reach: N/a

Surrounding Land Use:
meadow/forest

In-Situ Water Quality
Water Temperature (°C): 18.7
Air Temperature (°C):
DO(mg/L): pH:
Cond (µs/cm):

Water Clarity
☑ Clear ☐ Turbid Other:

Type of Watercourse
☐ Intermittent ☑ Permanent ☐ Ephemeral
☐ Channelized ☐ Naturalized
Other:

Groundwater Indicators
☑ Watercress ☐ Bubbling ☐ Seepage ☐ Iron Staining
☐ None ☐ Other:
(on right bank (facing US))

Watercourse Dimensions
Avg Wetted Width (m): 6.1 - 0.7 = 5.4
Avg Wetted Depth (m): 0.26
Avg Bankfull Width (m): 10.7
Avg Bankfull Depth (m): 0.55
Maximum Pool Depth (m): 0.127

Stream Morphology
% Riffle % Pool % Run 100.
% Flat

Stream Flow Conditions
☐ Low Flow ☑ Normal Fow ☐ High Flow
Comments:

Substrates % Cover
Silt Sand Clay Muck Gravel Cobble Boulder Bedrock 80
Comments: bedrock in sand, cobble, gravel

In-Stream Cover (%)
Large Woody Debris: Small Woody Debris: Undercut Banks*: Cobble:
Boulder: Aquatic Vegetation: 5% Other:

Aquatic Vegetation
☐ Emergent ☑ Submergent ☐ Floating
Description:

Riparian Cover (%) Width and Description	
LB grass, shrub, willow jewl weed wild grape	RB trees - ash, grass, jewl weed, buckthorn.
Overhanging Vegetation (%) ☑ Yes ☐ No	☑ Yes ☐ No
LB 5%.	RB 1%.

Field Crew: BK/GC
Recorded by: GC.

BEACON ENVIRONMENTAL

Aquatic Habitat Assessment

Canopy Cover (%)

☐ 0% ☑ 1-30% ☐ 30-60% ☐ 60-90% ☐ 90-100%

Description: _____

Bank Stability:	LB	RB
Eroding Bank (Steep >45°, undercut by at least 5 cm or shows signs of recent slumping	☐	☐
Vulnerable Bank Steep,>45°, shows no recent signs of erosion	☐	☐
Protected Bank (Steep >45°, Vegetation may or may not be present, includes banks armoured	☐	☐
Deposition zone (gently <45°, Point bars inside bends of streams)	☐	☐
No signs of erosion	☐	☐

LB Undercut Bank: Y / N Undercut Depth (m) **RB Undercut Bank: Y / N** Undercut Depth (m)

Obstructions to Fish Passage

☐ None Observed ☐ Man-made ☐ Natural ☐ Low Flow Barrier ☐ Other _____

Description _____

_____

Height of Barrier (m) _____ Waypoint #: _____

Notes

rip rap on right bank.

Photo & GPS Log

Photo Number	Description	Photo Number	Description
2472	US		
2473	DS		
2474	LB		
2475	RB.		

Field Crew: BK / GC

Recorded by: GC.

Aquatic Habitat Assessment

BEACON ENVIRONMENTAL

Date: August 15 2019
Weather: Sunny
Station: N/a
Waypoint #: 407
Type of Assessment: ☐ Reach Based ☑ Transect # 2

Project: 218416
Watercourse: Appleby Creek
Reach:

Surrounding Land Use:
forest

In-Situ Water Quality
Water Temperature (°C): 18
Air Temperature (°C):
DO(mg/L): pH:
Cond (µs/cm):

Water Clarity
☑ Clear ☐ Turbid Other:

Type of Watercourse
☐ Intermittent ☑ Permanent ☐ Ephemeral
☐ Channelized ☐ Naturalized
Other:

Groundwater Indicators
☐ Watercress ☐ Bubbling ☐ Seepage ☐ Iron Staining
☑ None ☐ Other:

Watercourse Dimensions
Avg Wetted Width (m): 4.3
Avg Wetted Depth (m): 0.37
Avg Bankfull Width (m): 4.8
Avg Bankfull Depth (m): 0.16
Maximum Pool Depth (m): 0.39

Stream Morphology
% Riffle % Pool 100 % Run
% Flat

Stream Flow Conditions
☐ Low Flow ☐ Normal Fow ☐ High Flow
Comments:

Substrates % Cover
Silt Sand Clay Muck Gravel Cobble Boulder Bedrock 50
Comments: 50% shale

In-Stream Cover (%)
Large Woody Debris: Small Woody Debris: Undercut Banks*: Cobble:
Boulder: Aquatic Vegetation: Other: shale

Aquatic Vegetation
☐ Emergent ☐ Submergent ☐ Floating
Description: none.

Riparian Cover (%) Width and Description	
LB forest	RB forest
Overhanging Vegetation (%) ☑ Yes ☐ No	☐ Yes ☑ No
LB 1%	RB

Field Crew: BK/GC **Recorded by:** GC

BEACON ENVIRONMENTAL

Aquatic Habitat Assessment

Canopy Cover (%)

☐ 0% ☐ 1-30% ☐ 30-60% ☐ 60-90% ☑ 90-100%

Description: _____

Bank Stability:	LB	RB
Eroding Bank (Steep >45°, undercut by at least 5 cm or shows signs of recent slumping	☐	☐
Vulnerable Bank Steep,>45°, shows no recent signs of erosion	☐	☐
Protected Bank (Steep >45°, Vegetation may or may not be present, includes banks armoured	☐	☐
Deposition zone (gently <45°, Point bars inside bends of streams)	☐	☐
No signs of erosion	☐	☐

LB Undercut Bank: Y / (N) Undercut Depth (m) **RB Undercut Bank:** Y / (N) Undercut Depth (m)

Obstructions to Fish Passage

☐ None Observed ☐ Man-made ☑ Natural ☐ Low Flow Barrier ☐ Other _____

Description rocks.

Height of Barrier (m) _____ Waypoint #: _____

Notes

Photo & GPS Log			
Photo Number	**Description**	**Photo Number**	**Description**
2478	US		
79	DS		
80	LB		
81	RB		
82	substrate		

Field Crew: BK/GC **Recorded by:** GC

Aquatic Habitat Assessment

BEACON ENVIRONMENTAL

Date: August 15 2019
Weather: Sunny
Station: N/a
Waypoint #: 408
Type of Assessment: ☐ Reach Based ☑ Transect # 3

Project: 21841 Oval Court
Watercourse: Appleby Creek
Reach: N/a

Surrounding Land Use:
forest

In-Situ Water Quality
Water Temperature (°C): 18.2
Air Temperature (°C):
DO(mg/L): pH:
Cond (µs/cm):

Water Clarity
☑ Clear ☐ Turbid Other:

Type of Watercourse
☐ Intermittent ☑ Permanent ☐ Ephemeral
☐ Channelized ☐ Naturalized
Other:

Groundwater Indicators
☐ Watercress ☐ Bubbling ☐ Seepage ☐ Iron Staining
☑ None ☐ Other:

Watercourse Dimensions
Avg Wetted Width (m): 2.8 - 0.3 = 2.5
Avg Wetted Depth (m): 0.08, 0.01, 0.05, 0.07
Avg Bankfull Width (m): 6.7
Avg Bankfull Depth (m): 0.45m
Maximum Pool Depth (m): N/a

Stream Morphology
% Riffle 100 % Pool % Run
% Flat

Stream Flow Conditions
☐ Low Flow ☑ Normal Fow ☐ High Flow
Comments:

Substrates % Cover
Silt Sand Clay Muck Gravel Cobble Boulder Bedrock
Comments: cobble, gravel, shale pieces.

In-Stream Cover (%)
Large Woody Debris: Small Woody Debris: Undercut Banks*: Cobble: 100
Boulder: Aquatic Vegetation: Other: shale

Aquatic Vegetation
☐ Emergent ☐ Submergent ☐ Floating
Description: none

Riparian Cover (%) Width and Description	
LB forest	RB forest
Overhanging Vegetation (%) ☑ Yes ☐ No	☐ Yes ☑ No
LB 1%	RB 1%

Field Crew: BK/GC **Recorded by:** GC

BEACON ENVIRONMENTAL

Aquatic Habitat Assessment

Canopy Cover (%)

☐ 0% ☐ 1-30% ☐ 30-60% ☐ 60-90% ☐ 90-100%

Description: _____

Bank Stability:	LB	RB
Eroding Bank (Steep >45°, undercut by at least 5 cm or shows signs of recent slumping	☑	☑
Vulnerable Bank Steep,>45°, shows no recent signs of erosion	☐	☐
Protected Bank (Steep >45°, Vegetation may or may not be present, includes banks armoured	☐	☐
Deposition zone (gently <45°, Point bars inside bends of streams)	☐	☐
No signs of erosion	☐	☐

LB Undercut Bank: Y / (N) Undercut Depth (m) 0 exposed tree root **RB Undercut Bank: Y / (N)** Undercut Depth (m) 0

Obstructions to Fish Passage

☐ None Observed ☐ Man-made ☑ Natural ☐ Low Flow Barrier ☐ Other _____

Description _____

Height of Barrier (m) _____ Waypoint #: _____

Notes

Photo & GPS Log

Photo Number	Description	Photo Number	Description
2499	US		
2500	DS		
2501	LB		
2502	RB		
2503	substrate		

Field Crew: BK/GC **Recorded by:** GC.

Aquatic Habitat Assessment

BEACON ENVIRONMENTAL

Date: Aug 15 2019
Weather: Sunny
Station: N/a
Waypoint #: 409.
Type of Assessment: ☐ Reach Based ☑ Transect # 4

Project: 218416
Watercourse: Appleby Creek
Reach: N/a

Surrounding Land Use:
forest

In-Situ Water Quality
Water Temperature (°C): 18.1
Air Temperature (°C): /
DO(mg/L): / pH:
Cond (µs/cm): /

Water Clarity
☑ Clear ☐ Turbid Other:

Type of Watercourse
☐ Intermittent ☑ Permanent ☐ Ephemeral
☐ Channelized ☐ Naturalized
Other:

Groundwater Indicators
☐ Watercress ☐ Bubbling ☐ Seepage ☐ Iron Staining
☑ None ☐ Other:

Watercourse Dimensions
Avg Wetted Width (m): 3.9
Avg Wetted Depth (m): 0.39
Avg Bankfull Width (m): 4.3
Avg Bankfull Depth (m): 0.75
Maximum Pool Depth (m):

Stream Morphology
% Riffle % Pool % Run 100
% Flat

Stream Flow Conditions
☐ Low Flow ☑ Normal Fow ☐ High Flow
Comments:

Substrates % Cover
Silt Sand Clay Muck ✓Gravel 10 ✓Cobble 10 Boulder Bedrock 80
Comments:

In-Stream Cover (%)
Large Woody Debris: Small Woody Debris: Undercut Banks*: rb + LB Cobble:
Boulder: Aquatic Vegetation: Other:

Aquatic Vegetation
☐ Emergent ☐ Submergent ☐ Floating
Description: none

Riparian Cover (%) Width and Description	
LB: forest	RB: forest — basswood, buckthorn, jewelweed
Overhanging Vegetation (%) ☐ Yes ☑ No	☐ Yes ☑ No
LB	RB

Field Crew: BK/GC

Recorded by: GC

BEACON ENVIRONMENTAL

Aquatic Habitat Assessment

Canopy Cover (%)

☐ 0% ☑ 1-30% ☑ 30-60% ☐ 60-90% ☐ 90-100%

Description: _____

Bank Stability:	LB	RB
Eroding Bank (Steep >45°, undercut by at least 5 cm or shows signs of recent slumping	☑	☑
Vulnerable Bank Steep,>45°, shows no recent signs of erosion	☐	☐
Protected Bank (Steep >45°, Vegetation may or may not be present, includes banks armoured	☐	☐
Deposition zone (gently <45°, Point bars inside bends of streams)	☐	☐
No signs of erosion	☐	☐

LB Undercut Bank: (Y) / N Undercut Depth (m) 0.52 **RB Undercut Bank:** (Y) / N Undercut Depth (m) 0.10

Obstructions to Fish Passage

☑ None Observed ☐ Man-made ☐ Natural ☐ Low Flow Barrier ☐ Other _____

Description _____

Height of Barrier (m) _____ Waypoint #: _____

Notes

Photo & GPS Log

Photo Number	Description	Photo Number	Description
2510	US		
2511	DS		
2512	LB		
2513	RB		

Field Crew: BK/GC **Recorded by:** GC

BEACON ENVIRONMENTAL

Aquatic Field Investigations
Fish Community Sampling

Date: Aug 15 2019
Weather: sunny 27°C
Licence #: 1093900
Waypoint #: N/A
Length of Channel Fished: N/A

Project: 2184116
Watercourse: Appleby Creek
Reach: N/A

Sampled Fish Common Name	Total Count (Dot Tally)	measurements (mm) Photo #
creek chub 123 total	143, 50, 98, 56, 97, 92, 56, 49, 47, 98 ⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠⊠	2450
pumpkin seed 17 total	78, 51, 78, 76, 77, 89, 61, 72, 64, 60, 75	2457 + 2458
brook stickle 4 total	45, 41, 39, 42	
salmonids 19 total	photo 2459-2460 - no measurement } possible rainbow. 82 - 2462-2463 56, 75, 66, 74, 71, 63, 69, 55, 60, 75, 71	
large mouth 4 total	66, 72, 55, 56 caught d/s of culvert	
fathead 1 total	•	

Field Crew: BK/GC
Protocol: N/A

Recorded by: GC

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Owl Cr		POLYGON: 2	
SURVEYOR(S): BW	DATE: Jun 6, Aug 26 2015		UTME
START	END	UTMZ	UTMN

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 ☐ OPEN WATER ☐ SHALLOW WATER ☑ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☐ OPEN ☑ SHRUB ☐ TREED		

STAND DESCRIPTION

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	1	Open Acer Salix Ulmus
2	SUB-CANOPY	3	4	Thicket Cornus Malus Rosa
3	UNDERSTOREY	4	2	Rosa Cornus Ribes Fragaria Solidago Galium
4	GRD. LAYER	5	3	Cultural Grasses Agrostis Alopecurus

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 0 = 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:	< 10	10 - 24	25 - 50	> 50
STANDING SNAGS:	< 10	10 - 24	25 - 50	> 50
DEADFALL / LOGS:	< 10	10 - 24	25 - 50	> 50

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

COMM. AGE	PIONEER	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:

COMMUNITY CLASS:	CODE:
COMMUNITY SERIES:	CODE:
ECOSITE:	CODE:
VEGETATION TYPE: Cultural Thicket	CODE: CUT1
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC — PLANT SPECIES LIST

	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

LAYERS: 1 = CANOPY > 10m 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	COLL.
Rhamnus					
Rosa sp					
Morella					
Acer sac					
Malus sp					
Cornus					
Crataegus sp					
Juglans					
Salix sp					
Alliaria					
Rubus					
Osmunda					
Prunus					
Corylus					
Acer rub					
Ribes					
Carex sp					
Fraxinus					
Toxicodendron					
Fragaria					
Agrostis					
Poa sp					
Bromus					
Dactylis					
Phleum					
Vicia cra					
Vitis					
Solidago					
Galium					
Urtica					
Impatiens					
Circaea					
Geum					
Parthenocissus					
Geranium					
Arctium					
Cirsium					
Taraxacum					
Plantago					
Verbena					
Daucus					
Prunella					
Hieracium					
Lysimachia					
Leucanthemum					
Tussilago					
Verbascum					
Cichorium					
Lotus					
Medicago					
Trifolium					
Vicia					
Lathyrus					
Hypericum					
Verbena					
Daucus					
Prunella					
Hieracium					
Lysimachia					
Leucanthemum					
Tussilago					
Verbascum					
Cichorium					
Lotus					
Medicago					
Trifolium					
Vicia					
Lathyrus					
Hypericum					

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE	Owl Ct		POLYGON: 3
SURVEYOR(S)		DATE Aug 26 2019	UTME
START	END	UTMZ	UTMN

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 (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	3	1	rhutyph morlba
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER	5	4	[illegible] solalti [illegible] swawe

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:	< 10	10 - 24	25 - 50	> 50
STANDING SNAGS:	< 10	10 - 24	25 - 50	> 50
DEADFALL / LOGS:	< 10	10 - 24	25 - 50	> 50

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

COMM. AGE	PIONEER	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)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS:	CODE:
COMMUNITY SERIES:	CODE:
ECOSITE:	CODE:
VEGETATION TYPE:	CODE: CUM1-1
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY > 10m 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	COLL.	SPECIES CODE	LAYER 1	2	3	4	COLL.
moralba						solalti					
rhutyph						[illegible]					
						phraaus					
						[illegible]					
						cirvulg					
						[illegible]					
						viccrac					
						circuta					
						swawe					
[illegible]											

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Owl Lk		POLYGON: 29	
SURVEYOR(S): DW	DATE: Jun 6, Aug 26	UTME: 2000	
START	END	UTMZ	UTMN

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 (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER	4	4	Typha sp. Lotus sp. Mixed Grasses

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:	< 10	10 - 24	25 - 50	> 50	
STANDING SNAGS:	< 10	10 - 24	25 - 50	> 50	
DEADFALL / LOGS:	< 10	10 - 24	25 - 50	> 50	
ABUNDANCE CODES:	N = NONE	R = RARE	O = OCCASIONAL	A = ABUNDANT	
COMM. AGE	PIONEER	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:

COMMUNITY CLASS:		CODE:
COMMUNITY SERIES:		CODE:
ECOSITE:		CODE:
VEGETATION TYPE:	Cattail Mineral Shallow Marsh	CODE: MAS2-1
INCLUSION		CODE:
COMPLEX		CODE:

Notes:

ELC
PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY > 10m 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	COLL.	SPECIES CODE	LAYER 1	2	3	4	COLL.

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Oval Ct		POLYGON:	
SURVEYOR(S): [illegible]	DATE: Jun 6 / Aug 26	UTME: 7020	
START	END	UTMZ:	UTMN:

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
	☐ CARB. BEDRK	☐ TABLELAND		☐ LICHEN	☐ SWAMP
		☐ ROLL. UPLAND		☐ BRYOPHYTE	☐ FEN
		☐ CLIFF		☑ DECIDUOUS	☐ BOG
		☐ TALUS		☐ CONIFEROUS	☐ BARREN
		☐ CREVICE / CAVE		☐ MIXED	☐ MEADOW
		☐ ALVAR			☐ PRAIRIE
		☐ ROCKLAND			☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☑ WOODLAND
		☐ BLUFF			☐ FOREST
					☐ PLANTATION

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

STAND DESCRIPTION

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	dh >> jrpyrus > Salxfrag > Ulmam > Acesac > Cratmon > Rhoaro
2	SUB-CANOPY	3	3	Rhoaro > Acesac > Cratmon > Rhoaro
3	UNDERSTOREY	4	2	Ligvul > Lonmic > rhoaro > Prunvir
4	GRD. LAYER	5	4	Solcan > Poavir > Glapar > Leucrut

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	O	25 - 50	R	> 50
STANDING SNAGS:	O	< 10	O	10 - 24	O	25 - 50	R	> 50
DEADFALL / LOGS:	O	< 10	O	10 - 24	O	25 - 50	R	> 50

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

COMM. AGE	PIONEER	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

COMMUNITY CLASS:	CODE:
COMMUNITY SERIES:	CODE:
ECOSITE:	CODE:
VEGETATION TYPE: Cultural Woodland	CODE: CUW1
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC — PLANT SPECIES LIST

	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

LAYERS: 1 = CANOPY > 10m 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	COLL.
Ulmam					
Jrpyrus					
Acesac					
Salxfrag					
Rhoaro					
Thuocc					
rubspe					
Ligvul					
Prunvir					
Rhoalb					

SPECIES CODE	LAYER 1	2	3	4	COLL.
unpgrad					
asplyre					
Solcan					
Lonmic					
galapp					
Cratmon					
ranacr					
antsyl					
Poavir					
Glapar					
Leucrut					
Rhoalaxy					
Dryfra					
rhotyp					
Phaaru					
Thuocc					
Corsto					

Appendix D

Flora List

Appendix D

Flora List

Scientific Name	Common Name	S-RANK [a]	Halton Region [b]
Rhus typhina	Staghorn Sumac	S5	-
Toxicodendron rydbergii	Western Poison Ivy	S5	-
Cicuta maculata	Spotted Water-hemlock	S5	-
Daucus carota	Queen Anne's Lace	SNA	-
Apocynum cannabinum	Clasping-leaved Indian Hemp	S5	HU
Asclepias syriaca	Common Milkweed	S5	-
Achillea millefolium var. millefolium	Common Yarrow	SNA	-
Arctium lappa	Greater Burdock	SNA	-
Cirsium arvense	Creeping Thistle	SNA	-
Erigeron annuus	White-top Fleabane	S5	-
Erigeron philadelphicus	Philadelphia Fleabane	S5	-
Solidago altissima var. altissima	Tall Goldenrod	S5	-
Sonchus arvensis ssp. arvensis	Field Sowthistle	SNA	-
Symphyotrichum lanceolatum ssp.	Panicled Aster	S5	-
Taraxacum officinale	Common Dandelion	SNA	-
Tussilago farfara	Colt's Foot	SNA	-
Impatiens capensis	Spotted Jewel-weed	S5	-
Betula pendula	European Weeping Birch	SNA	-
Ostrya virginiana	Eastern Hop-hornbeam	S5	-
Cynoglossum officinale	Hound's-tongue	SNA	-
Hackelia virginiana	Virginia Stickseed	S5	HU
Lithospermum officinale	European Gromwell	SNA	-
Alliaria petiolata	Garlic Mustard	SNA	-
Barbarea vulgaris	Yellow Rocket	SNA	-
Hesperis matronalis	Dame's Rocket	SNA	-
Campanula rapunculoides	Creeping Bellflower	SNA	-
Lonicera morrowii	Morrow's Honeysuckle	SNA	-
Lonicera tatarica	Tartarian Honeysuckle	SNA	-
Lonicera x bella	Bell's Honeysuckle	SNA	-
Viburnum opulus	Guelder-rose Viburnum	SNA	-
Hypericum perforatum	St. John's-wort	SNA	-
Cornus racemosa	Gray Dogwood	S5	-
Cornus sericea ssp. sericea	Red-osier Dogwood	S5	-
Thuja occidentalis	Northern White Cedar	S5	-
Carex blanda	Woodland Sedge	S5	-
Carex radiata	Stellate Sedge	S5	-
Dipsacus fullonum ssp. sylvestris	Common Teasel	SNA	-

Scientific Name	Common Name	S-RANK [a]	Halton Region [b]
Elaeagnus angustifolia	Russian Olive	SNA	-
Euphorbia esula	Leafy Spurge	SNA	-
Coronilla varia	Crown-vetch	SNA	-
Medicago lupulina	Black Medic	SNA	-
Melilotus albus	White Sweet Clover	SNA	-
Vicia cracca	Tufted Vetch	SNA	-
Quercus macrocarpa	Bur Oak	S5	-
Geranium maculatum	Wild Geranium	S5	-
Juglans nigra	Black Walnut	S4?	-
Leonurus cardiaca ssp. cardiaca	Common Motherwort	SNA	-
Lythrum salicaria	Slender-spike Loosestrife	SNA	-
Morus alba	White Mulberry	SNA	-
Fraxinus pennsylvanica	Green Ash	S5	-
Ligustrum vulgare	European Privet	SNA	-
Circaea canadensis	Enchanter's Nightshade	S5	-
Oxalis stricta	Upright Yellow Wood Sorrel	S5	-
Picea abies	Norway Spruce	SNA	-
Picea pungens	Colorado Spruce	SNA	-
Pinus nigra	Black Pine	SNA	-
Phalaris arundinacea	Reed Canary Grass	S5	-
Poa palustris	Fowl Bluegrass	S5	-
Poa pratensis ssp. pratensis	Kentucky Bluegrass	SNA	-
Anemonastrum canadense	Canada Anemone	S5	-
Ranunculus acris	Tall Buttercup	SNA	-
Rhamnus cathartica	Buckthorn	SNA	-
Crataegus monogyna	English Hawthorn	SNA	-
Crataegus punctata	Dotted Hawthorn	S5	-
Crataegus sp.	Hawthorn Species	-	-
Geum canadense	White Avens	S5	-
Geum urbanum	Clover-root	SNA	-
Potentilla recta	Sulphur Cinquefoil	SNA	-
Prunus serotina	Wild Black Cherry	S5	-
Prunus virginiana var. virginiana	Choke Cherry	S5	-
Pyrus communis	Common Pear	SNA	-
Rosa multiflora	Rambler Rose	SNA	-
Rubus idaeus ssp. strigosus	Wild Red Raspberry	S5	-
Rubus occidentalis	Black Raspberry	S5	-
Galium aparine	Cleavers	S5	-
Salix fragilis	Crack Willow	SNA	-
Acer negundo	Manitoba Maple	S5	-
Acer platanoides	Norway Maple	SNA	-
Acer x freemanii	Freeman's Maple	S5	-
Verbascum thapsus	Common Mullein	SNA	-

Scientific Name	Common Name	S-RANK [a]	Halton Region [b]
Tilia americana	American Basswood	S5	-
Typha angustifolia	Narrow-leaved Cattail	S5	-
Ulmus americana	American Elm	S5	-
Parthenocissus vitacea	Thicket Creeper	S5	-
Vitis riparia	Riverbank Grape	S5	-

a - SRANK (from Natural Heritage Information Centre) for breeding status: S1 (Extremely Rare), S2 (Very Rare), S3 (Rare to Uncommon) (S4 (Common), S5 (Very Common) SNA (Not applicable…'because the species is not a suitable target for conservation activities'; includes non-native species)

b - Crins *et al.* 2006 (Halton Natural Areas Inventory): HU (Halton Uncommon)

Appendix E

Tree Density Analysis Report (Updated May 2023)

May 2, 2023 BEL 218416

Branthaven Development Corp.
720 Oval Court
Burlington, ON L7L 6A9

Re: Supplemental Tree Density Analysis of Appleby Creek Valleylands
720, 735 & 740 Oval Court and 5135 & 5155 Fairview Street, Burlington, Ontario

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The purpose of this letter by Beacon Environmental Limited (Beacon) is to provide supplemental information on the density of trees associated with the Appleby Creek valleylands, north and south of Fairview Street, adjacent to the Subject Property. The location of the Subject Property is illustrated in **Figure 1**.

The purpose of the Tree Density Analysis is to confirm whether the treed areas within the Appleby Creek valleylands meet the definition of a "woodland" as it is defined in the Halton Region and City of Burlington Official Plans.

Both Official Plans define 'woodlands" as follows:

> *WOODLAND means land with at least: 1000 trees of any size per ha, or 750 trees over 5 cm in diameter per ha, or 500 trees over 12 cm in diameter per ha, or 250 trees over 20 cm in diameter per ha but does not include an active cultivated fruit or nut orchard, a Christmas tree plantation, a plantation certified by the Region, a tree nursery, or a narrow linear strip of trees that defines a laneway or a boundary between fields. For the purpose of this definition, all measurements of the trees are to be taken at 1.37 m from the ground and trees in regenerating fields must have achieved that height to be counted.*

A Tree Density Analysis was originally undertaken on August 26, 2019 for the section of the Appleby Creek valleylands north of Fairview Street. The analysis was based on tree density data collected from 24 sample plots placed in vegetation communities mapped as Cultural Thicket or Cultural Woodland. The results of the 2019 analysis were presented in a separate report that was included in Appendix E of the March 2023 Environmental Evaluation Report/Environmental Impact Assessment (EIR/EIS) prepared by Beacon. The findings of the 2019 analysis confirmed that the valleylands north of Fairview Street do not meet the definition of a woodland when all the plot data are combined.

As the 2019 analysis did not include an analysis of the valleylands south of Fairview Street and did not collect data in accordance with the exact size classes in the woodland definition, Beacon established 12 supplemental plots in the Cultural Woodland communities identified north and south of Fairview Street (ELC units 1a and 1b), on April 14, 2023, as illustrated in **Figure 1**. Four plots were established within the Cultural Woodland (ELC unit 1a) south of Fairview Street and eight plots were established in the Cultural Woodland north of Fairview Street (ELC unit 1b). The supplemental plots were circular and 100 m^2 in area. For each plot, tree species and size (trunk diameter at breast height) were recorded based on the following four size categories

- <5 cm DBH;
- 5-11.5 cm DBH;
- 12-19.5 cm DBH; and
- >20 cm DBH.

Dead trees were not counted in the analysis. Multi-stem stem trees (i.e., hawthorns) were also recorded as one tree.

A summary of the 2023 supplemental plot data is presented in **Attachment A**.

The total area sampled for ELC unit 1a (south of Fairview Street) was 400 m^2 (0.04 ha), which contained a total of 22 trees. This translates to a total of 550 trees per hectare. **Table 1** summarizes the number of trees per hectare according to the Official Plan size categories. Based on this analysis, ELC Unit 1a does not satisfy the density requirements to qualify as "woodland'.

Table 1. Summary of Tree Density Calculations for ELC Unit 1a south of Fairview Street

Tree density calculations		Density thresholds to meet OP definition of "Woodland"	Density Threshold Met?
Total number of trees/ha	550	1000	No
Total trees >5 cm/ha (assume 75% of trees ≤10 cm DHB are >5 cm DBH)	350	750	No
Total number of trees >12 cm/ha	125	500	No
Total number of trees >20 cm/ha	75	250	No

The total additional area sampled in 2023 for ELC unit 1b was 800 m^2 (0.08 ha), which contained a total of 62 trees. This translates to a total of 775 trees per hectare. **Table 2** summarizes the number of trees per hectare according to the Official Plan size categories. Based on this analysis, the feature does not satisfy the density requirements to qualify as "woodland'.

Table 2. Summary of Tree Density Calculations for ELC Unit 1b (2023 plots)

Tree density calculations		Density thresholds to meet OP definition of "Woodland"	Density Threshold Met?
Total number of trees/ha	775	1000	No
Total trees >5 cm/ha (assume 75% of trees ≤10 cm DHB are >5 cm DBH)	363	750	No
Total number of trees >12 cm/ha	213	500	No
Total number of trees >20 cm/ha	138	250	No

However, when the 2019 and 2023 overall stem data (trees of any size) for ELC Unit 1b are combined, then a density of 1,026 trees/ha is achieved which exceeds the threshold of 1,000 trees/ha. Despite exceeding the threshold of 1,000 trees/ha, the area of ELC Unit 1b is 0.29 ha and less than 0.5 ha required to qualify as significant woodland under the Regional Official Plan.

Should you have any questions regarding this assessment, please contact the undersigned.

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Legend

- Subject Lands
- Study Area
- ELC Communities
- Watercourse (Beacon 2020)
- 2019 Tree Density Plots
- 2023 Tree Density Plots

ELC Unit	ELC Community	ELC Code	Area (ha)
1	Cultural Woodland	CUW1	0.53
2	Cultural Thicket	CUT1	0.42
3	Cultural Meadow	CUM1	0.15
4	Cattail Mineral Shallow Marsh	MAS2-1	0.01

Site Location and Tree Density Plots

Figure 1

Tree Density Analysis -
Oval Court Redevelopment,
City of Burlington

BEACON ENVIRONMENTAL

Project: 218416
Last Revised: May 2023

Client: Branthaven Development Corp

Prepared by: BD
Checked by: SG

N

1:1,500

0 25 50 m

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Attachment A

2023 Tree Density Plot Data

ELC Unit 1a - Cultural Woodland (CUW) - South of Fairview Street

Species	Common Name	DBH Range (cm)			
		1-4.5	5-11.5	12-19.5	20+
Fraxinus pennsylvanica	Green Ash	1	3		
Juglans nigra	Black Walnut		3	1	
Salix fragilis	Crack Willow		1		
Juglans nigra	Black Walnut	1			1
Fraxinus pennsylvanica	Green Ash	3	1		
Acer negundo	Manitoba Maple			1	
Fraxinus pennsylvanica	Green Ash	2	1		
Juglans nigra	Black Walnut				1
Gleditsia triacanthos var inermis	Thornless Honey Locust	1			1
	Trees/400m2	8	9	2	3
	Trees/ha	200	225	50	75
	total trees/ha	**550**			
	trees >5 cm/ha	**350**			
	trees >12 cm/ha	**125**			
	trees >20 cm/ha	**75**			

ELC Unit 1b - Cultural Woodland (CUW) - North of Fairview Street

Plot	Species	Common Name	DBH Range (cm)			
			1-4.5	5-11.5	12-19.5	20+
	Juglans nigra	Black Walnut		1		1
	Fraxinus pennsylvanica	Green Ash	2			
	Crataegus sp.	Hawthorne	1	2		
29	*Acer negundo*	Manitoba Maple	1	1		
	Juglans nigra	Black Walnut				1
	Crataegus sp.	Hawthorne	3	1		
	Fraxinus pennsylvanica	Green Ash	7	3		
30	*Salix fragilis*	Crack Willow				1
	Acer negundo	Manitoba Maple			1	
	Fraxinus pennsylvanica	Green Ash	1			
	Juglans nigra	Black Walnut				1
31	*Crataegus sp.*	Hawthorne	1			

Plot	Species	Common Name	DBH Range (cm)			
			1-4.5	5-11.5	12-19.5	20+
	Fraxinus pennsylvanica	Green Ash	1			1
	Acer negundo	Manitoba Maple	1		1	
	Salix fragilis	Crack Willow				1
32						
	Crataegus sp.	Hawthorne			1	
	Acer negundo	Manitoba Maple	2			
	Juglans nigra	Black Walnut				1
33	*Fraxinus pennsylvanica*	Green Ash	2			
	Crataegus sp.	Hawthorne			1	
	Acer negundo	Manitoba Maple			1	
34	*Fraxinus pennsylvanica*	Green Ash				
	Juglans nigra	Black Walnut				1
	Salix fragilis	Crack Willow				1
	Fraxinus pennsylvanica	Green Ash	4			
35	*Acer negundo*	Manitoba Maple		2		
	Fraxinus pennsylvanica	Green Ash	7	2		
	Ulmus americana	White Elm				1
	Juglans nigra	Black Walnut				1
36	*Crataegus sp.*	Hawthorne			1	
		Trees/800m^2	33	12	6	11
		Trees/ha	413	150	75	138
		total trees/ha	**775**			
		trees >5 cm/ha	**363**			
		trees >12 cm/ha	**213**			
		trees >20 cm/ha	**138**			

2019 Tree Density Plot Data – North of Fairview Street

ELC Unit	Plot	Species	Common Name	DBH Range (cm)			
				<10	11-20	21-30	31-40
1b	1 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	21			
		Crataegus sp.	Hawthorne	1			
1b	2 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	1	1	1	
		Crataegus sp.	Hawthorne	1			
		Acer negundo	Manitoba Maple	1	1		
1b	3 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	3			
		Crataegus sp.	Hawthorne		1		
		Acer negundo	Manitoba Maple	5			
		Juglans nigra	Black Walnut				1
1b	4 (100 m²)	*Fraxinus pennsylvanica*	Green Ash				1
		Acer negundo	Manitoba Maple		2		
		Juglans nigra	Black Walnut				1
1b	5 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	4	1		2
		Crataegus sp.	Hawthorne	1			
		Acer negundo	Manitoba Maple		2		
		Juglans nigra	Black Walnut			1	
1b	6 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	8	2		
		Crataegus sp.	Hawthorne	5			
		Juglans nigra	Black Walnut				1
2b	7 (100 m²)	*Crataegus sp.*	Hawthorne	6			
2b	8 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	2			
		Acer platanoides	Norway Maple	1			
2b	9 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	3		1	
		Acer negundo	Manitoba Maple	1	2		
		Betula pendula	European Birch		2		
1b	10 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	23			
2a	11 (100 m²)	***None***					
2a	12 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	1			
2a	13 (30 m²)	*Fraxinus pennsylvanica*	Green Ash	1			
		Pyrus communis	Pear		1	1	
2a	14 (30 m²)	*Fraxinus pennsylvanica*	Green Ash	1			
		Acer negundo	Manitoba Maple	1	1		
2a	15 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	7			
		Crataegus sp.	Hawthorne	1	1		
2a	16 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	3			1
		Malus pumila	Common Apple		2		
2a	17 (100 m²)	*Fraxinus pennsylvanica*	Green Ash	5			

ELC Unit	Plot	Species	Common Name	DBH Range (cm)			
				<10	11-20	21-30	31-40
		Acer negundo	Manitoba Maple	1			
		Juglans nigra	Black Walnut	1			
2a	**18 (100 m²)**	*Fraxinus pennsylvanica*	Green Ash	4	1		
		Crataegus sp.	Hawthorne	2			
		Salix fragilis	Crack Willow				1
2a	**19 (100 m²)**	*Fraxinus pennsylvanica*	Green Ash	2			
2a	**20 (100 m²)**	*Fraxinus pennsylvanica*	Green Ash	4	1	1	
		Crataegus sp.	Hawthorne	5			
2a	**21 (100 m²)**	*Fraxinus pennsylvanica*	Green Ash	4		1	1
		Crataegus sp.	Hawthorne	1	1		
		Ulmus americana	White Elm	1			
2a	**22 (100 m²)**	*Fraxinus pennsylvanica*	Green Ash	4	1		
		Crataegus sp.	Hawthorne		1		
		Ostrya virginiana	Ironwood	1	1	1	
2a	**23 (100 m²)**	*Fraxinus pennsylvanica*	Green Ash	3			
		Crataegus sp.	Hawthorne	4	2		
		Malus pumila	Common Apple	1			
2a	**24 (30m²)**	*Fraxinus pennsylvanica*	Green Ash	1			
		Crataegus sp.	Hawthorne	2			
	Trees/2190m²			**148**	**27**	**7**	**9**
	Trees/ha			**676**	**123**	**32**	**41**

	Total number of trees/ha	872
	Total trees >5 cm/ha (assume 75% of trees under 10 cm DHB are >5 cm DBH)	703
	Total number of trees >12 cm/ha	196
	Total number of trees >20 cm/ha	73

Appendix F

Assessment for Significant Valleyland

Appendix F

Assessment of Appleby Creek at Oval Court Redevelopment for Significant Valleyland

Criterion	Standard for Significance[1]	Applicability to Study Area	Criterion Met?
Surface Water functions	• Catchment of 50 ha or greater • Active or historic erosion of river banks • Depositional features • Associated wetlands	• Catchment of 873 ha • Areas of active erosion associated with seasonal or long-term cycles of change are present along the creek banks (as opposed to river banks as outlined in the standard for significance) • Minimal depositional features • One very small wetland present	✓ (due to catchment size)
Groundwater functions	• Area of important groundwater recharge or groundwater discharge	• The groundwater flow direction is indicative of possible recharge conditions (DS Consultants Ltd. 2020) • Not located in a highly vulnerable aquifer • No groundwater discharge noted by hydrogeological study	✘
Landform prominence	• Large, well-defined valley morphology (e.g., floodplains, meander belts, valley slopes) with average width of 25 m or more	• Appleby Creek is not considered a major valley system by Conservation Halton, unlike Grindstone, Bronte, or Sixteen Mile Creek. • Appleby Creek is not recognized as a significant valleyland under the City OP or Regional OP • On a small scale, this reach of Appleby creek has defined valley slopes; however, it does not have a defined floodplain. • the valleylands adjacent to the site have an average[2] width of 30 m and a minimum width of 18.8 m	✘
Distinctive geomorphic landforms	• Features such as oxbows, bottomlands, terraces, deltas, exposed soil strata or eroding slopes along riverbanks or valley walls	• Geomorphic features are limited to the presence of valley slopes and floodplain • No oxbows, terraces, or deltas are present	✘
Degree of naturalness	• Greater than 25% natural vegetation cover • Riparian vegetation greater than 30 m wide on each side of channel • High floristic quality index (FQI)	• The valleyland NHS is predominantly vegetated; however, it is comprised mostly non-native or invasive species so its degree of naturalness is considered low. For this reason, most of the ecological communities are classified as cultural and not natural. • Riparian vegetation, as defined in ELC Field Guide (Lee et al. 1998), is limited to the area within or immediately adjacent to the creek and does not include vegetation associated with the valley slopes. The estimated average width of riparian zone vegetation adjacent to the subject lands is approximately 15 m (including the channel which itself is ~4.0 m wide). Therefore, riparian vegetation is below the threshold of 30 m for this criterion. • The floristic quality index (FQI) for this reach of valleyland is 12.66 and is not considered high. The value is low and corresponds to a community of minimal significance from a natural quality perspective.	✘
Community and species diversity	• High community and/or species diversity	• Community and species diversity is considered relatively low as the valleylands are highly disturbed due to flooding, erosion and predominance of non-native invasive species.	✘
Unusual community and species	• Seasonally important habitats such as deer yards, migration stopovers, etc. • High proportion of regionally and locally significant species • Rare communities or habitat of rare species, based on federal or provincial guidelines	• No seasonally important habitats such as deer yards, migration stopovers. • No regionally or locally rare plant species. • Although Little Brown Myotis are present, they were observed in low numbers and this species is typically found in urban areas. • Black-crowned Night-Heron (BCNH) potential foraging habitat	✘
Habitat value	• Undisturbed, natural area needed to sustain regional species diversity	• Valley is dominated by non-native vegetation and species tolerant of highly disturbed sites • Not necessary to support regional diversity	✘
Linkage function	• Natural vegetation corridors with a minimum width of 100 m • Functional ecological connections • Determined to be important wildlife corridor	• The valleylands have an average width of 30 m and a minimum width of 18.8 m which is well below the 100 m minimum width. • The region considers 60 m to be the minimum width for a functional local scale linkage or ecological connection. • Wildlife use is typical of an urban creek corridor and not considered to represent an important wildlife corridor.	✘ (excepting fish habitat)

Criterion	Standard for Significance[1]	Applicability to Study Area	Criterion Met?
Restoration potential and value	• Restoration would provide important ecological benefits such as linkage function, improvement of habitat for rare species, reduced fragmentation effects, and/or increased core natural areas. • Areas where restoration would provide a minimum 30 m corridor of riparian vegetation on **each side** of surfacewater features	• While restoration can be used to restore ecological functions and improve habitat conditions, because the area is small and within an urban matrix, restoration would not contribute significantly to the landscape level enhancements noted. • Riparian vegetation cannot be restored to minimum width of 30 m on either side of the channel, as the landform is already constrained by existing development.	✘
		Proposed Significance of Appleby Creek in Study Area:	**Not Significant**

1. Paraphrased criteria and standards from in the *Natural Heritage Reference Manual for the Natural Heritage Policies of the Provincial Policy Statement, 2005, Second Edition* (OMNR 2010).
2. Based on six measurements from the east long-term stable top of slope or floodline to the west top of slope or floodline, whichever provides the greatest width.

Appendix F

Assessment of Appleby Creek at Oval Court Redevelopment for Significant Valleyland

Criterion	Standard for Significance[1]	Applicability to Study Area	Criterion Met?
Surface Water functions	• Catchment of 50 ha or greater • Active or historic erosion of river banks • Depositional features • Associated wetlands	• Catchment of 873 ha • Areas of active erosion associated with seasonal or long-term cycles of change are present along the creek banks (as opposed to river banks as outlined in the standard for significance) • Minimal depositional features • One very small wetland present	✓ (due to catchment size)
Groundwater functions	• Area of important groundwater recharge or groundwater discharge	• The groundwater flow direction is indicative of possible recharge conditions (DS Consultants Ltd. 2020) • Not located in a highly vulnerable aquifer • No groundwater discharge noted by hydrogeological study	✘
Landform prominence	• Large, well-defined valley morphology (e.g., floodplains, meander belts, valley slopes) with average width of 25 m or more	• Appleby Creek is not considered a major valley system by Conservation Halton, unlike Grindstone, Bronte, or Sixteen Mile Creek. • Appleby Creek is not recognized as a significant valleyland under the City OP or Regional OP • On a small scale, this reach of Appleby creek has defined valley slopes; however, it does not have a defined floodplain. • the valleylands adjacent to the site have an average[2] width of 30 m and a minimum width of 18.8 m	✘
Distinctive geomorphic landforms	• Features such as oxbows, bottomlands, terraces, deltas, exposed soil strata or eroding slopes along riverbanks or valley walls	• Geomorphic features are limited to the presence of valley slopes and floodplain • No oxbows, terraces, or deltas are present	✘
Degree of naturalness	• Greater than 25% natural vegetation cover • Riparian vegetation greater than 30 m wide on each side of channel • High floristic quality index (FQI)	• The valleyland NHS is predominantly vegetated; however, it is comprised mostly non-native or invasive species so its degree of naturalness is considered low. For this reason, most of the ecological communities are classified as cultural and not natural. • Riparian vegetation, as defined in ELC Field Guide (Lee et al. 1998), is limited to the area within or immediately adjacent to the creek and does not include vegetation associated with the valley slopes. The estimated average width of riparian zone vegetation adjacent to the subject lands is approximately 15 m (including the channel which itself is ~4.0 m wide). Therefore, riparian vegetation is below the threshold of 30 m for this criterion. • The floristic quality index (FQI) for this reach of valleyland is 12.66 and is not considered high. The value is low and corresponds to a community of minimal significance from a natural quality perspective.	✘
Community and species diversity	• High community and/or species diversity	• Community and species diversity is considered relatively low as the valleylands are highly disturbed due to flooding, erosion and predominance of non-native invasive species.	✘

Unusual community and species	• Seasonally important habitats such as deer yards, migration stopovers, etc. • High proportion of regionally and locally significant species • Rare communities or habitat of rare species, based on federal or provincial guidelines	• No seasonally important habitats such as deer yards, migration stopovers. • No regionally or locally rare plant species. • Although Little Brown Myotis are present, they were observed in low numbers and this species is typically found in urban areas. • Black-crowned Night-Heron (BCNH) potential foraging habitat	✘
Habitat value	• Undisturbed, natural area needed to sustain regional species diversity	• Valley is dominated by non-native vegetation and species tolerant of highly disturbed sites • Not necessary to support regional diversity	✘
Linkage function	• Natural vegetation corridors with a minimum width of 100 m • Functional ecological connections • Determined to be important wildlife corridor	• The valleylands have an average width of 30 m and a minimum width of 18.8 m which is well below the 100 m minimum width. • The region considers 60 m to be the minimum width for a functional local scale linkage or ecological connection. • Wildlife use is typical of an urban creek corridor and not considered to represent an important wildlife corridor.	✘ (excepting fish habitat)
Restoration potential and value	• Restoration would provide important ecological benefits such as linkage function, improvement of habitat for rare species, reduced fragmentation effects, and/or increased core natural areas. • Areas where restoration would provide a minimum 30 m corridor of riparian vegetation on **each side** of surfacewater features	• While restoration can be used to restore ecological functions and improve habitat conditions, because the area is small and within an urban matrix, restoration would not contribute significantly to the landscape level enhancements noted. • Riparian vegetation cannot be restored to minimum width of 30 m on either side of the channel, as the landform is already constrained by existing development.	✘
		Proposed Significance of Appleby Creek in Study Area:	**Not Significant**

1. Paraphrased criteria and standards from in the *Natural Heritage Reference Manual for the Natural Heritage Policies of the Provincial Policy Statement, 2005, Second Edition* (OMNR 2010).
2. Based on six measurements from the east long-term stable top of slope or floodline to the west top of slope or floodline, whichever provides the greatest width.