9236 and 9322 Dickenson Road West

Scoped EIS, Linkage Assessment, and Tree Preservation Plan for Building 3

September 2022

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1. INTRODUCTION

1.1. STUDY PURPOSE & OBJECTIVES

Dougan & Associates (D&A) was retained by Panattoni Development Company to complete an Environmental Impact Study for a draft plan of subdivision and site plan application (See Appendix A). The subject properties are located at 9236 and 9322 Dickenson Road West, Glanbrook, Ontario (Part of Lot 4, Concession 2, City of Hamilton, Ontario). In total, the properties are approximately 37 hectares in size with a frontage of 180m and depth of 570mand are bounded by Dickenson Road to the south, and private agricultural lands to the north, west, and east (See Figure 1 for project location and landscape context). Two private residential lots are located adjacent to the southwest corner of the subject property along Dickenson Road, and a nursery business is located southeast of the property.

The requirement for an EIS and Tree Preservation Plan (TPP) was identified by the City of Hamilton during the Formal Consultation process (FC-19-087; August 14, 2019). This requirement was based on a proposed development within adjacent lands to several natural heritage features identified within the City's Official Plan (Core Areas – Key Natural Heritage Features and Key Hydrologic Features), and by the Niagara Peninsula Conservation Authority (NPCA) due to proposed development within regulated areas (wetlands and watercourses). This EIS has been completed as per the City's EIS Guidelines (City of Hamilton 2015). A formal Terms of References for this EIS was scoped and reviewed approved by the City and NPCA, and is included in Appendix B.

The first submission of the EIS (including Linkage Assessment and Tree Preservation Plan) was made in March 2020 for a draft plan of subdivision and site plan for the entirety of the subject properties, and comments were received from the City of Hamilton and Niagara Peninsula Conservation Authority (NPCA) in July 2020. A second submission was made in July 2021 based on these comments, and comments were received on November 1, 2021. A third submission was made in December 2021 and comments were received from the city dated February 22, 2022. This fourth version of the EIS has been updated specifically for Site Plan Approval for Building 3 within Block 1 of the Draft plan. As such, the proposed developed addressed in this EIS covers a smaller area than the first three submission. The study area boundary remains unchanged over the original EISs, as well as the extent and scope of the characterization. However, the characterization has been update to reflect field data collected in 2022, and the impact assessment has been updated to focus on the site plan for building 3 rather than the entire subject property. Agency comments from the first three submissions have been considered in this report, where applicable to Block 1.

1.2. BACKGROUND INFORMATION REVIEW

The following background sources and legislation relevant to the property were consulted to provide a preliminary understanding of the natural heritage features and functions present on the subject lands and in the vicinity.

- Natural Heritage Information Centre (NHIC) Biodiversity Atlas;
- Ontario Ministry of Natural Resources and Forestry (MNRF) wetland mapping and data, including the 20 Mile Creek PSW Record An updated MNRF wetland GIS layer for the Twenty Creek PSW was received from MNRF staff on May 3rd, 2021 and used to update

the PSW boundary on all figures. This mapping reflects the wetland delineation completed by D&A in August, 2019
- Niagara Peninsula Conservation Authority (NPCA) mapping and data;
- Hamilton Natural Areas Inventory (NAI) site summaries, mapping and data;
- Hamilton Urban Official Plan and Schedules and relevant zoning by-laws;
- City of Hamilton Tree Protection Guidelines
- AEGD Subwatershed Study & Stormwater Master plan (SWMP) and implementation report; and,

Relevant policies are described in Section 2, and background data pertaining to the study area is provided in Section 4.

2. POLICY REVIEW

The following federal, provincial and local policies apply to the study area. A brief description is provided below, and their implications are discussed under Section 6.1 where applicable.

2.1.1. MIGRATORY BIRDS CONVENTION ACT (GOVERNMENT OF CANADA, 1994)

This federal legislation protects the nests, eggs and offspring of listed migratory bird species from destruction or disturbance. In its application, it requires best management practices to detect and avoid disturbance to active nests during development activities.

2.2. PROVINCIAL

2.2.1. PROVINCIAL POLICY STATEMENT

The Provincial Policy Statement (PPS) is issued under the authority of Section 3 of the Planning Act. Section 3 requires that decisions affecting planning matters "shall be consistent with" policy statements under the Act. It should also be noted that Section 4.3 of the PPS establishes that the PPS is to be read in its entirety and all relevant policies are to be applied to each situation. In that context, the PPS has been reviewed and policies relevant to this proposal provided below.

Section 1.0

8.12 *Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns*

8.12.2 *Healthy, liveable and safe communities are sustained by:*
- *h. promoting development and land use patterns that conserve biodiversity; and*
- *i. preparing for the regional and local impacts of a changing climate.*

1.6 Infrastructure and Public Service Facilities

1.6.2 Planning authorities should promote green infrastructure to complement infrastructure.

1.6.6.7 Planning for stormwater management shall:

- *c. minimize erosion and changes in water balance, and prepare for the impacts of a changing climate through the effective management of stormwater, including the use of green infrastructure;*
- *e. maximize the extent and function of vegetative and pervious surfaces; and*

1.7 Long-Term Economic Prosperity

1.7.1 Long-term economic prosperity should be supported by:
- *k. minimizing negative impacts from a changing climate and considering the ecological benefits provided by nature; and*

1.8 Energy Conservation, Air Quality and Climate Change

1.8.1 Planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and preparing for the impacts of a changing climate through land use and development patterns which:

- *f. promote design and orientation which maximizes energy efficiency and conservation, and considers the mitigating effects of vegetation and green infrastructure; and*
- *g. maximize vegetation within settlement areas, where feasible.*

Section 2.1 of the Provincial Policy Statement (2020), which is the section that relates specifically to natural heritage, establishes clear direction on the adoption of an ecosystem approach, and the protection of resources that have been identified as 'significant': wetlands, habitats of endangered or threatened species, fish habitat, woodlands, valleylands, wildlife habitat, and areas of natural and scientific interest. Relevant portions of the Section 2.1 include the following:

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 & 7E1, 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 7E1; and*
- *b. significant coastal wetlands.*

Section 2.1.5 of the PPS states that development and site alteration of the following features is not permitted unless it has been demonstrated that there will be *no negative impacts* on the natural features or their ecological functions:

- a. *significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E1;*
- 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 7E1 that are not subject to policy 2.1.4(b)*

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.

Section 2.1.8 of the PPS states that development and site alteration on *adjacent lands* to natural heritage features identified in Section 2.1.4, 2.1.5, and 2.1.6 are not permitted unless there has been an evaluation of the ecological function of the adjacent lands and it has been demonstrated that there will be *no negative impacts* on the natural features or on their ecological functions.

Section 2.2 contains policies to water and development:

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:*
    - *1. protect all municipal drinking water supplies and designated vulnerable areas; and*
    - *2. protect, improve or restore vulnerable surface and ground water, sensitive surface water features and sensitive ground water features, and their hydrologic functions;*
- *g. planning for efficient and sustainable use of water resources, through practices 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.

2.2.2. ENDANGERED SPECIES ACT (2007)

The Endangered Species Act (2007) provides the provincial mandate for the protection of species identified as Endangered, Threatened or Special Concern at the provincial level. Only habitats of provincially Endangered and Threatened species are specifically protected. Habitat of provincial Special Concern species is not protected under the ESA, but these species do receive protection under the Provincial Policy Statement (2014) as Significant Wildlife Habitat (OMNR 2000).

2.2.3. CONSERVATION AUTHORITIES ACT / O. REG. 150/06 (2006) AND NPCA POLICIES

The Niagara Peninsula Conservation Authority (NPCA) is authorized under Section 28 of the Conservation Authorities Act to implement and enforce the Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 155/06). Permits are required to identify potential interference in areas within the 100-year floodline, 15 metres of the shoreline, 15 metres within a valley's top of bank, hazard lands, and 120 metres around all PSWs and ELC wetlands greater than 2 ha, and 30 metres around all ELC wetlands greater than 0.5 ha.

Under Ontario Regulation 150/06, the NPCA is able to regulate or prohibit development within river or stream valleys, wetlands, Lake Erie shorelines, inland lakes, and hazardous lands within the Grand River watershed. The NPCA also has authority to prohibit or regulate alterations to existing creek channels, or changes to wetlands. Modifications to the extent of the Regulated Areas may be made where more detailed studies, such as an EIS, determine a more precise boundary.

2.3. LOCAL

2.3.1. URBAN HAMILTON OFFICIAL PLAN (2013)

The study area is within the urban area of the city of Hamilton (UHOP). The Urban Hamilton Official Plan (City of Hamilton, 2013) provides long-term direction and guidance over planning matters, such as land use and development, within the amalgamated communities within the City of Hamilton. This includes the development of a natural heritage system to protect natural areas and features within the Greenbelt Plan, the Niagara Escarpment Plan, and additional locally and provincially significant natural areas within the City that are beyond these planning areas.

The City's natural heritage System is provided in Schedule B of the OP consists of the Niagara Escarpment Plan area, Core Areas and supporting Linkages identified by the City, based on requirements of the Provincial Policy Statement (2014). Core Areas include key natural heritage features (e.g. significant woodland), key hydrological features (e.g. wetlands), provincially significant natural areas , and locally significant natural areas (e.g. Environmentally Sensitive Areas).

With the respect to the zoning of natural heritage features, the general policies (Section 2.2) state:

2.2.8 All natural features, required vegetation protection zones, and enhancement or restoration areas on a property shall be placed under appropriate zoning in the zoning by-law and/or protected through a conservation easement to the satisfaction of the City or the relevant Conservation Authority, or deeded to a public authority. Acquisition by a public body may also be considered as an option for protecting natural features and functions.

General policies pertaining to Core Areas within the Natural Heritage System include:

2.3 Natural Heritage System – Core Areas

It is the intent of this policy to preserve and enhance Core Areas and to ensure that any development or site alteration within or adjacent to them shall not negatively impact their natural features or their ecological functions.

2.3.1 In accordance with the policies of this Plan, Schedule B – Natural Heritage System, identifies Core Areas to include key natural heritage features and key hydrological features. Core Areas of the City's Natural Heritage System also include other locally and provincially significant natural areas. Schedule B – Natural Heritage System shall be amended when new Core Areas are identified.

2.3.2 Core Areas include key natural heritage features, key hydrological features and provincially significant and local natural areas that are more specifically identified by Schedule B-1-8 – Detailed Natural Heritage Features. Core Areas are the most important components in terms of biodiversity, productivity, and ecological and hydrological functions.

2.3.3 The natural features and ecological functions of Core Areas shall be protected and where possible and deemed feasible to the satisfaction of the City enhanced. To accomplish this protection and enhancement, vegetation removal and encroachment into Core Areas shall generally not be permitted, and appropriate vegetation protection zones shall be applied to all Core Areas.

Relevant policies specific to the natural heritage system outside the Greenbelt Plan Area, include:

2.5.2 New development and site alteration shall not be permitted within provincially significant wetlands, significant coastal wetlands or significant habitat of threatened and endangered species.

2.5.3 New development and site alteration shall not be permitted within fish habitat, except in accordance with provincial and federal requirements.

2.5.4 New development and site alteration shall not be permitted within significant woodlands, significant valleylands, significant wildlife habitat and significant areas of natural and scientific interest unless it has been demonstrated that there shall be no negative impacts on the natural features or on their ecological functions.

2.5.5 New development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in Section C.2.5.2 to C.2.5.4 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there shall be no negative impacts on the natural features or on their ecological functions.

New development or site alterations within or adjacent to Core Areas shall require the approval of an EIS which demonstrates the following (as per section C.2.5.8, City of Hamilton, 2013):

a) There shall be no negative impacts on the Core Area's natural features or their ecological functions;
b) Connectivity between Core Areas shall be maintained, or where possible, enhanced for the movement of surface and ground water, plants and wildlife across the landscape;
c) The removal of other natural features shall be avoided or minimized by the planning and design of the proposed use or site alteration wherever possible.

According to section 2.5.9 of the OP, the EIS should also propose a vegetation protection zone of sufficient width to protect the Core Area and its ecological functions during and after construction, where VPZs are to be maintained as natural, self-sustaining vegetation.

Section 2.5.10 states that the following VPZs are to be evaluated for features relevant to the study area:

b) Warmwater Watercourse and Important and Marginal Habitat – 15 metre vegetation protection zone on each side of the watercourse, measured from the bankfull channel.

c) Provincially Significant Wetlands – 30-metre vegetation protection zone, measured from the boundary of the wetland, as approved by the Conservation Authority or Ministry of Natural Resources.

d) Unevaluated wetlands – Unevaluated wetlands and locally significant wetlands require a 15 metre vegetation protection zone, measured from the boundary of the wetland, as approved by the Conservation Authority or Ministry of Natural Resources, unless an Environmental Impact Statement recommends a more appropriate vegetation protection zone.

e) Woodlands – 10-metre vegetation protection zone, measured from the edge (drip line) of the woodland.

f) Significant woodlands – 15-metre vegetation protection zone, measured from the edge (drip line) of the significant woodland.

i) Significant Habitat of Threatened or Endangered Species and Significant Wildlife Habitat: the minimum vegetation protection zone shall be determined through Environmental Impact Statements, dependent on the sensitivity of the feature.

Specific VPZ widths may be more or less than specified above, and are to be determine on a site-specific basis, as stated within Section 2.5.11:

2.5.11 Vegetation protection zone widths greater or less than those specified in a) to i) above may be required if ecological features and functions warrant it, as determined through an approved Environmental Impact Statement. Widths shall be determined ona site-specific basis, by considering factors such as the sensitivity of the habitat, the potential impacts of the proposed land use, the intended function of the vegetation protection zone, and the physiography of the site.

Permitted sues within VPZs are specified in Section 2.5.12:

2.5.12 Permitted uses within a vegetation protection zone shall be dependent on the sensitivity of the feature, and determined through approved studies. Generally, permitted uses within a vegetation protection zone shall be limited to low impact uses, such as vegetation restoration, resource management, and open space. Permitted uses within the vegetation protection zone shall be the same uses as those within the Core Area in Policy C.2.5.1 and the vegetation protection zone should remain in or be returned to a natural state.

2.5.13 All plantings within vegetation protection zones shall use only non-invasive plant species native to Hamilton. The City may require that applicants for development or site alteration develop a restoration or management plan for the vegetation protection zone as a condition of approval.

Linkages are features within the City's Natural Heritage System that connect Core Areas to allow for the movement of species across the landscape and serve to enhance the functions of Core Areas. Relevant policies specific to Linkages are described in Section 7:

2.7.1 The City shall encourage the connection of Core Areas within the municipality and adjacent to its municipal boundaries through the identification of Linkages in Environmental Impact Statements, Secondary Plans, watershed plans, and other studies.

2.7.3 The City shall require the incorporation of Linkages into a design of new development requiring approval by this Plan to retain and enhance the cultural, aesthetic, and environmental qualities of the landscape, wherever possible and deemed feasible to the satisfaction of the City.

2.7.4 Since linkages are best enhanced and protected through larger-scale planning processes, Secondary Plans shall identify and evaluate Linkages in greater detail, including Linkages currently identified in Schedule B – Natural Heritage System and those that may be newly identified through the planning process. Linkages shall be mapped in Secondary Plans and policies for their protection and enhancement included.

2.7.5 Where new development or site alteration is proposed within a Linkage in the Natural Heritage System as identified in Schedule B – Natural Heritage System, the applicant shall prepare a Linkage Assessment. On sites where an Environmental Impact Statement (EIS) is being prepared, the Linkage Assessment can be included as part of the EIS report. Any required Linkage Assessment shall be completed in accordance with Policy F.3.2.1.11 – Linkage Assessments.

2.7.6 Linkage Assessments shall include the following information:

- *a) identify and assess the Linkage including its vegetative, wildlife, and/or landscape features or functions;*
- *b) assess the potential impacts on the viability and integrity of the Linkage as a result of the development proposal; and,*
- *c) make recommendations on how to protect, enhance or mitigate impacts on the Linkage(s) and its functions through planning, design and construction practices.*

2.7.7 In addition to the Linkages identified on Schedule B – Natural Heritage System, there may be Hedgerows that are worthy of protection, especially where:

- *a) they are composed of mature, healthy trees and generally provide a wide, unbroken linkage between Core Areas;*
- *b) there is evidence that wildlife regularly use them as movement corridors or habitat;*
- *c) they contain tree species which are threatened, endangered, special concern, provincially or locally rare; or,*

d) groupings of trees which are greater than 100 years old.

Lastly, Section 3.2.1.11 within Chapter F of the Official Plan (Implementation) outlines the requirements for linkage assessments within Environmental Impact Statements:

3.2.1.11 Linkage assessments shall consider both the linkage within the site and connections with other sites and shall evaluate the following:

- *a) identify and assess the linkage including its vegetative, wildlife, and/or landscape features or functions, including:*
  - *i) the natural areas and habitats/functions linked (number of sites linked and habitat sizes and condition);*
  - *ii) linkage type (e.g. anthropogenic railway or utility corridor, hedgerow, plantation, or natural community);*

iii) vegetation cover type quality (health, condition, maturity, species, and aesthetic value);
iv) width;
v) length; and,
vi) continuity of vegetation (long gaps greater than 100 metres, gaps containing roads or other barriers, or gaps less than 30 metres wide with no barriers);

b) assess the potential impacts on the viability and integrity of the linkage as a result of the development proposal; and,

c) make recommendations on how to protect, enhance or mitigate impacts on the linkage(s) and its functions through planning, design and construction practices.

2.3.2. AIRPORT EMPLOYMENT GROWTH DISTRICT (AEGD) SECONDARY PLAN

The UHOP provides long-term direction and guidance over planning matters, such as land use and development within the City of Hamilton. This includes the development of a Natural Heritage System (NHS) to protect natural areas and features of significance. The AEGD Secondary Plan (2021) is an approved amendment to the UHOP, which provides specific planning policies to the lands which are the focus of this EIS.

The AEGD Secondary Plan guides development on a portion of land surrounding the John C. Munro Hamilton International Airport. The Secondary Plan envisions the area to be a place of employment, to be developed with a high degree of eco-industrial and urban design. The natural heritage principles of the AEGD (Section 8.2.11) include developing in a manner that is sensitive to the natural environment, for example: use of innovative, sustainable storm and wastewater infrastructure to protect water quality and source water; protection and integration of provincially and municipally significant natural features, such as streams, valley lands, wetlands, mature trees and forests into the employment district's development; implementation of provincial natural heritage policy; use of sustainable design to limit emissions, water and energy consumption of buildings within the employment district; and connection of employment district's open space system to surrounding natural areas to allow employees to enjoy and explore the region's natural heritage. Secondary Plan Section 8.12.1 recognizes the presence of NHS features within the AEGD Secondary Plan area and states that the policies of UHOP Section C.2.0 apply, with the exception of Section C.2.4

AEGD Secondary Plan Design Principles - Section 8.14 of the AEGD Secondary Plan sets out an extensive list of design principles, which are to be considered with respect to new development. Notably, energy conservation, greenhouse gas reduction, and climate change adaptation are promoted (Section 8.14.6). Stormwater guidelines are provided requiring protection and maintenance of stream corridors to address flood control and fish habitat regulatory requirements. Stormwater guidelines are also provided that inform design requirements related to flow control, flooding, erosion control, water balance, and water quality (Section 8.4.15). The AEGD design principles also encourage the incorporation of sustainable design elements into the site to maintain ecological integrity (Section 8.14.26); minimization of site disturbance and tree replanting to compensate for tree removals (Section 8.14.27); any measures that may reduce heat island effect (Section 8.14.29); and roadway designs that promote naturalized areas and green corridors (Section 8.14.30). The design principles specify that the location of local roads through natural heritage systems should only be considered where no other access is possible (Section 8.14.35). Buildings are encouraged to consider exterior lighting with the intention of minimizing light pollution (Section 8.14.61). Lastly, landscaping plans that support ecology

through the design of naturalized groves of trees and incorporation of low maintenance native plant species are encouraged (Section 8.14.71).

Land Use Designations - The general land designation for the site is Employment Area (Schedule E), which is further broken down into more detailed designations of Airport Employment Growth District and Open Space (Schedule E1). The Employment Area designation is applied to lands that are intended to be "the primary employment generators in the City and the location of diverse areas of employment" (Section E.2.7). Employment Areas are intended to include industrial uses, research and development, and other uses (Section E.2.7.2). Employment Area policies are discussed in UHOP Section E.5.0 and policies specific to the Airport Employment Growth District are set out in Section E.5.5. One of the goals listed for Employment Areas is to "recognize and support the constribution of older industrial areas and existing and newly developing business parks, such as…the Airport Employment Growth District." (Section E.5.1.1). The Open Space land designation generally includes a variety of open areas such as NHS features, trails, and parks (Section C.3.3). The intention is that these areas are used for recreational activities, conservation management, or other open space uses (Section C.3.3.1).

The AEGD land use mapping provides an even greater level of detail, illustrating the property as a mix of Airport Light Industrial, Airport Prestige Business, and Natural Open Space (Map B.8-1). Airport Prestige Business lands are generally those with frontage on existing and future major roads; a variety of permitted uses are listed in the Secondary Plan policies (Section 8.4.5.1). Airport Light Industrial lands are intended to support development for employment uses that do not necessarily require frontage on major roads; a variety of permitted uses are listed in the Secondary Plan policies (Section 8.4.6.1). Secondary Plan policies related to the Natural Open Space designation are discussed in Section 8.5 of the Secondary Plan. The general purpose of this designation is to recognize, preserve and protect natural heritage features as a key element of the area's character.

NHS Mapping - The primary schedules to the UHOP show that the property is within the Urban Boundary (Schedule A) and includes areas designated within the City's NHS (Schedule B). The NHS consists of Core Areas, Linkages, and the matrix of lands between them which may be suitable for restoration. Specifically, with respect to the NHS, there are mapped Core Areas including Key Hydrologic Feature Streams (Schedule B), Key Hydrologic Feature Wetlands (Schedule B4) as well as a Key Hydrologic Feature Lake (Schedule B5) present on the property. The UHOP main schedules show no mapped ANSI's, Significant Woodlands, Alvar, Tallgrass Prairie, or Environmentally Significant Areas on the property (Schedules B1, B2, B3, B6 & B7). AEGD Secondary Plan mapping provides greater detail of NHS features on the property including the location of Core Areas, Linkages, Hedgerow Features, Unclassified Streams, and Support/Indirect Fish Habitat (Map B.8-2).

NHS Policies (Outside the Greenbelt) – General policies for NHS lands outside of the Greenbelt (Section C.2.5) do not permit development or site alterations within provincially significant wetlands (Section C.2.5.2), significant habitat of threatened and endangered species (Section C.2.5.2), nor fish habitat (Section C.2.5.3). Development and site alterations are also not permitted within significant woodlands or significant wildlife habitat unless it can be demonstrated that there will be no negative impact on the natural feature or its ecological functions (Section C.2.5.4). Development on adjacent lands to these features is only permitted if ecological functions of the adjacent lands have been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions (Section C.2.5.5).

Core Areas (General) - Any development proposed within or adjacent to Core Areas must not result in negative impact on the features or their ecological functions (Section C.2.3). Core Areas include key natural heritage features, key hydrological features, and provincially significant and local natural areas (Section C.2.3.2). The City has defined Core Areas to include a variety of ecological feature types that have policy protection at other levels, thereby linking UHOP policy with the Provincial Policy Statement and other relevant provincial and federal natural heritage policy. The boundaries of Core Areas can be refined through more detailed studies such as EIS's (Sections C.2.2.2, C.2.5.1).

Key Natural Heritage Features (KNHF's) - KNHF's are included as Core Areas within the NHS and thus are generally intended to be protected and enhanced. The UHOP defines KNHF's to include a) Significant habitat of endangered and threatened species; b) Fish habitat; c) Wetlands; d) Life Science Areas of Natural and Scientific Interest (ANSIs); e) Significant valleylands; f) Significant wildlife habitat; g) Sand barrens, savannahs, and tallgrass prairies; h) Significant Woodland ; and i) Alvars.

Key Hydrologic Features (KHFs) – KHF's are included as Core Areas within the NHS and thus are generally intended to be protected and enhanced. The UHOP defines KHF's to include: a) permanent and intermittent streams; b) lakes and their littoral zones; c) seepage areas and springs; and d) wetlands. UHOP policy states that streams are to be classified as either Coldwater Watercourse/Critical Habitat or Warmwater Watercourse/Important/Marginal Habitat (Section C.2.5.7), to which different policies apply. With respect to wetlands, UHOP policy differentiates between provincially significant wetlands and unevaluated lands assigning them different levels of policy protection, which is in-line with related provincial policy and NPCA regulations.

Local Natural Areas – Local Natural Areas are included as Core Areas within the NHS and thus are generally intended to be protected and enhanced. The UHOP defines Local Natural Areas to include Environmentally Significant Areas (ESAs) as identified by the City of Hamilton, unevaluated wetlands, and Earth Science Areas of Natural and Scientific Interest (ANSI).

Vegetation Protection Zones (VPZ) – UHOP policy expects EIS studies to propose VPZs that have sufficient width to protect Core Areas and their ecological functions, and that will achieve naturally self-sustaining vegetation (Section C.2.5.9). City guidance on VPZ widths includes the following:

- "Warmwater Watercourse and Important and Marginal Habitat – 15 metre vegetation protection zone on each side of the watercourse, measured from the bankfull channel"
- "Provincially Significant Wetlands – 30-metre vegetation protection zone, measured from the boundary of the wetland, as approved by the Conservation Authority or Ministry of Natural Resources."
- "Unevaluated wetlands – Unevaluated wetlands and locally significant wetlands require a 15 metre vegetation protection zone, measured from the boundary of the wetland, as approved by the Conservation Authority or Ministry of Natural Resources, unless an Environmental Impact Statement recommends a more appropriate vegetation protection zone."
- "Woodlands – 10-metre vegetation protection zone, measured from the edge (drip line) of the woodland."
- "Significant woodlands – 15-metre vegetation protection zone, measured from the edge (drip line) of the significant woodland."
- "Significant Habitat of Threatened or Endangered Species and Significant Wildlife Habitat: the minimum vegetation protection zone shall be determined through Environmental Impact Statements, dependent on the sensitivity of the feature."

(Section C.2.5.10)

Linkages – Linkages are natural areas within the landscape that ecologically connect Core Areas. (Section C.2.7). The City encourages the connection of Core Areas through the identification of Linkages within the UHOP or other studies such as EIS's (Section C.2.7.1). The City requires that Linkages be incorporated into the design of new developments to enhance the cultural, aesthetic, and environmental qualities of the landscape (Section C.2.7.3). The boundaries of Linkages are intended to be refined through more detailed studies such as EIS's (Sections C.2.2.2) and can be achieved through completion of a Linkage Assessment. Linkage Assessments are required where new development or site alteration is proposed within an identified Linkage (Section C.2.7.5). The requirements for completing a Linkage Assessment are set out in UHOP Section C.2.7.6. Hedgerows may provide a linkage function and, even when not identified as a Linkage on UHOP Schedules, should be considered as per the policies set out in UHOP Section C.2.7.7.

Tree and Woodland Protection – The City encourages sustainable forestry practices and the protection and restoration of trees and forests. The UHOP refers to several additional policy documents that guide the protection of trees and woodlands within the City including the Woodland Conservation Bylaw and Tree Protection Policy, and the Woodland Protection Strategy. These are relevant to new development sites and are further discussed in subsequent sections of this report.

2.3.3. CITY OF HAMILTON URBAN WOODLAND BY-LAW (14-212)

The City's Urban Woodland By-law aims to promote the conservation and sustainable use of woodlands on private property within the Urban Boundary. This by-law prohibits the injury or destruction of privately-owned trees in woodlands larger than 0.2 hectares within the Urban Boundary. Section 11 a) and b) of this By-law, Sensitive Natural Areas, such as Core Areas, must be adequately protected preserved, along with steam and wetland functions.

3. STUDY APPROACH

The purpose of this field study program was to characterize natural heritage features and functions within the study area, to screen for the presence of Species at Risk (SAR) and other flora and fauna of conservation concern (e.g. provincially, locally or regionally rare species and their habitats), and to screen for the presence of Significant Wildlife Habitat (SWG).

The study area used was based on the anticipated development limit plus adjacent lands within 120m (Figure 2). All of the woodland and wetland features contiguous with the 120m area adjacent to the subject property were also included within the study area to accurately characterize their form and ecological functions.

Several supporting studies required by the City are in progress and will be completed in 2020. These include:

- Aquatic Habitat Assessment
- Hydrogeology Study
- Geomorphologic Assessment

Key findings from these studies will be summarized and used to update the characterization of the study area and impact assessment.

3.1. PHYSIOGRAPHY AND TOPOGRAPHY

The physiography and topography of the site were reviewed using the Ontario Geological Survey (OGS Earth 2020, Chapman and Putnam 1984) in order to understand how it may influence the biophysical conditions of the site. The geotechnical study prepared by Terraprobe (2019) was also be reviewed to confirm site-specific soil conditions.

3.2. HYDROLOGY AND HYDROGEOLOGY

A preliminary investigation of the existing hydrological conditions was completed based on a Headwater Drainage Feature Assessment. A Geomorphic Assessment with Erosion Flow Exceedance Analysis and Hydrogeological Study has been completed, with key results provided in later sections of this report.

3.2.1. HEADWATER DRAINAGE FEATURE ASSESSMENT

Headwater Drainage Features were assessed by GeoProcess Research Associates following the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (2014 HDF Guidelines). Aerial imagery was first reviewed prior to commencing the field assessments to determine potential HDF features within the Study area. Two visits took place to assess the HDF features in the study area, on March 21, 2019, April 25th, 2019, March 11, 2020 and June 1, 2020.

A third summer visit was not completed as it is used to assess the hydrologic regime of the HDF. If a HDFs are not conveying flow on the second visit, then a third visit is not required as it will not have any influence on the outcome of the HDF assessment. As of the second field visit only HDF 1 was conveying

flow, however, given the feature is being retained as an open channel, a third visit would not provide any additional change to the management recommendations for this feature.

3.3. VEGETATION

3.3.1. ECOLOGICAL LAND CLASSIFICATION (ELC)

Vegetation communities within the study area were characterized according to the Ecological Land Classification (ELC) System protocol for Southern Ontario, 1st approximation (Lee et al., 1998). ELC classification and mapping were produced via aerial photo interpretation and confirmation through field surveys.

Three site visits were carried out by a D&A ecologist (May 20 and 21 2019, July 12 and 18, 2019, and , September 4 and 5, 2019) to document all vascular plant species present within the canopy, sub-canopy, understory, and ground layers along with relative abundance (section 3.3.2). Soil texture and moisture regime were also characterized at representative topographic positions (e.g. table lands, valley slope, bottom lands). Based on differences in species composition, soil characteristics and moisture regime, the study area was delineated into ELC vegetation communities. Field data was compiled into a Microsoft Access database and linked to mapped ELC units in an ArcGIS feature class where it could be managed, reviewed, and exported for analysis and reporting.

3.3.2. BOTANICAL INVENTORY

Spring, summer and fall botanical surveys were carried out simultaneously with ELC surveys, on May 20 and 21 2019, July 12 and 18, 2019, and September 4 and 5, 2019. These surveys involved taking an inventory of vascular plant species observed within each ELC polygon. The data from these surveys were supplemented with additional species observations made during other surveys (e.g. wetland delineation, tree inventories), as well as observations from spring 2022. This information was added to the Microsoft Access ELC database to facilitate data management, QA/QC, analysis, and mapping. The taxonomy, nomenclature and provincial ranks for each of the species are consistent with the Natural Heritage Information Centre (NHIC 2017). Plant rarity status was assessed using COSEWIC rankings for federal status (NHIC, 2017), SARO ranks for Species at Risk in Ontario (NHIC, 2017), Srank for rarity in Ontario (NHIC, 2017), and the Hamilton Natural Areas Inventory (2014) for local status.

Floristic Quality Index (FQI) and mean wetness index (CW) were calculated for each polygon using Oldham et al. (1995). The Floristic Quality Index allows comparison of vegetation communities based on their richness of native species and the Coefficient of Conservatism for each species, which is a value assigned to each species based on its affinity for specific habitats. Generally, more disturbed communities have a lower FQI relative to natural communities with little anthropogenic disturbance. The mean wetness index is the average of the wetness indices for all species within a polygon, which are values assigned to each species based on their probability of occurring in wetlands. Generally, wetlands have mean CW values ranging from -5 to 0, whereas uplands have mean CW values ranging from 0 to +5.

3.3.3. WETLAND AND WOODLAND DELINEATION

The boundary of the 20 Mile Creek Provincially Significant Wetland (PSW) within the study area was delineated based on the Ontario Wetland Evaluation System (MNRF, 2013) by D&A staff on July 12 and

18, 2019, and confirmed by an NPCA ecologist and Environmental Planner with the City of Hamilton on August 6, 2019. The wetland boundary points were geolocated by Speight, Van Nostrand & Gibson Ltd. on August 6, 2019. The boundary of the PSW within the properties directly to the east, 2240 Upper James Street and behind the Hamilton Street Railway (HSR) Mountain Transit Centre, were updated in June 2022 and confirmed with NPCA staff on June 30th, 2022. These updated wetland boundaries have been provided to the NPCA>

The boundaries (dripline) of woodland features within the study area were delineated and confirmed with D&A and City of Hamilton staff on August 6, 2019. After this site visit, a portion of one of the woodlands was. As a result, the boundary of this feature was revised and re-confirmed with City of Hamilton Staff on June 21, 2022.

3.3.4. TREE INVENTORY & ARBORIST ASSESSMENT

A tree inventory and arborist assessment were completed as per the City of Hamilton's Tree Protection Guidelines (Hamilton 2010). Site visits to inventory and assess trees on the property were conducted by certified ISA arborists on June 7th, 12th, 19th, and 26th, 2019, August 15th, 19th, and 26th, 2019, September 5th, 13th, 2019, and October 23rd, 2019. The tree survey was updated in the fall of 2020 to include additional trees along Dickenson Road where widening of the road will occur.

Trees were tagged with metal forestry tags and geolocated using our in-house Trimble Geo7X unit. Each tree was assessed for biological health, structural condition, and preservation priority and ranked according to the City's Guidelines. Additional information recorded included species name, DBH, height, canopy diameter, and general health observations (e.g. Emerald Ash Borer infection, decay)

3.4. WILDLIFE

3.4.1. NOCTURNAL AMPHIBIAN CALL SURVEYS

Three Nocturnal Amphibian Call Surveys were conducted as per the Marsh Monitoring Protocol (BSC 2009) on April 24, May 24, and June 26, 2019, and April 13, May, 14, and June 16, 2022. The surveys were completed within MMP windows of April 15- 30, May 15-30 and June 15-30, when the minimum night air temperatures were at least 5 degrees C, 10 degrees C and 17 degrees C. Table 1 summarizes the observation conditions.

Table 1. Summary of 2019 Nocturnal Amphibian Call Surveys.

Date	Observer	Time	Weather Conditions	Purpose
April 24, 2019	Kristen Beauchamp	22:23– 23:20	Light northeast winds (beaufort 2), cloudy, 7°C	Nocturnal Amphibian Survey #1
May 24, 2019	Zack Harris	22:42 – 23:30	Light west winds (beaufort 1 to 2), clear, 14°C	Nocturnal Amphibian Survey #2
June 26, 2019	Heather Schibli	22:50– 23:50	Light northeast winds (beaufort 2), clear, 23°C	Nocturnal Amphibian Survey #3
April 13, 2022	Zack Harris	21:30– 22:30	15°C, light wind	Nocturnal Amphibian Survey #1
May 14, 2022	Zack Harris	23:35 – 00:30	15°C, light wind	Nocturnal Amphibian Survey #2
June 16, 2022	Zack Harris	23:41 -00:16	Light SW/north winds (beaufort 1 to 2), clear, 23°C	Nocturnal Amphibian Survey #3

3.4.2. BREEDING BIRD SURVEYS

Two Breeding Bird Surveys were conducted on May 29 and June 25, 2019, by a qualified avian ecologist, as per the Ontario Breeding Bird Atlas (2007) protocol which stipulates that the first survey will take place between May 24 and June 15 and the second survey will take place between June 15 and July 10, and surveys should be carried out at least seven days apart. According to the protocol, surveys should occur between sunrise and approximately 10:00 a.m. and under suitable weather conditions (i.e. light winds, good visibility, and no heavy rain). Survey details are provided in Table 2.

Table 2. Summer of 2019 breeding bird surveys.

Date	Observer	Time	Weather Conditions	Purpose
May 29, 2019	Carl-Adam Wegenschimmel	07:45 – 10:00	calm, cloudy, 19°C	Breeding Bird Survey #1
June 25, 2019	Carl-Adam Wegenschimmel	08:00 – 10:30	Light winds, cloudy 24°C	Breeding Bird Survey #2

3.4.3. REPTILE SURVEYS

Snake surveys were undertaken on May 15 and May 29, 2019, to search for any active snakes on site as well as for features that may represent hibernacula. The surveys were conducted during warm (at least 15°C) and sunny conditions with light winds, when snakes would be most likely active in spring. The surveys involved searching all areas of the site and adjacent lands, taking care to look under debris and rotting logs in order to find snakes and other herpetofauna (e.g. salamanders). Suitable locations for reptile basking were also searched repeatedly during each of the other site visits for botanical and ELC. Reptile observations were supplemented by incidental observations throughout the season.

3.4.4. INCIDENTAL WILDLIFE

Incidental wildlife observations were made during all field visits in 2019.

3.5. AQUATIC RESOURCES

A number of aquatic resources have been identified on-site, include headwater drainage features and an on-line pond. Aquatic resources provided a variety of functions including flow conveyance, sediment transport, nutrient movement and aquatic ecological functions. The two distinct aquatic types, lentic and lotic, found within the Subject Property each provide distinct functions, with the lotic environments favouring physical processes (flow and sediment conveyance), while the lentic environments support aquatic ecological functions.

3.5.1. AQUATIC HABITAT CHARACTERIZATION

Lentic environments are associated with the pond feature and were assessed primarily through visual inspections during the March and June 2020 HDF assessments. Formal fish community sampling of the pond was not conducted as visual inspections identified fish use, and it was determined that formal surveys would not provide any additional information and would only result in stress to the fish in the pond. Lotic environments are comprised of the headwater drainage features which were assessed under the OSAP HDF Module 11 for Unconstrained features.

3.6. LINKAGE ASSESSMENT

Linkages are defined in the Urban Hamilton Official Plan (UHOP) and Rural Hamilton Official Plan (RHOP) as follows:

Natural areas within the landscape that ecologically connect Core Areas. They are avenues along which plants and animals can propagate, genetic interchange can occur, populations can move in response to environmental changes and life cycle requirements and species can be replenished from other natural areas. Conserving Linkages also protects and enhances Core Areas.

(City of Hamilton, 2012)

A linkage assessment was carried out for the site following the City of Hamilton's Linkage Assessment Guidelines (2015) and the Term of Reference for this project (see Appendix B). The linkage assessment was conducted by compiling vegetation and wildlife data collected for the project, and analysis of ELC and wildlife mapping. A summary of linkage functions is provided in section 4.6, and an assessment of impacts on these features and their functions is provided in section 6.3.

4. EXISTING CONDITIONS

4.1. PHYSIOGRAPHY

4.1.1. PHYSICAL SETTING

The study area is situated in the northern extent of the Haldimand Clay Plains between two Till Moraines, one to the southwest and one to the northeast of the property (Chapman and Putnam 1984). The whole study area rests on clay plain composed of fine-textured glaciolacustrine deposits (silt and clay, minor sand and gravel) (Chapman and Putnam 1984). The topography is generally variable and undulating, with the highest-grade elevations approximately centered on the site, and overall change in grade across the site being approximately 7 metres (Terraprobe, 2019).

Geotechnical boreholes conducted by Terraprobe (2019) determined topsoil to be overlying near surficial strata of disturbed (possibly fill) silt and clayey to sandy silt. This is overlaying undisturbed strata of silt and clayey to sandy silt, and glacial till, with isolated pockets of silty sand (Terraprobe, 2019).

4.2. HYDROLOGY

4.2.1. HEADWATER DRAINAGE FEATURE ASSESSMENT

Aerial imagery of the Study Area was reviewed prior to commencing the field assessments to determine potential HDF features within the Study Area. In total five features were identified as potential HDFs requiring an assessment and were investigated in the field. In the field one HDF (HDF 2) was split into two reaches for assessment due to the distinctly differing adjacent land conditions, so resulting in a total of six HDF reach assessments were completed (Figure 2).

The Subject Property is located in the headwaters of Twenty Mile Creek, with five (HDF 2, HDF 2a ,3, HDF 4 and HDF 5) features draining small catchments and consequently being very small features. One HDF is more substantial (HDF 1) as it conveys flow from a much larger catchment upstream of the Subject Property. HDF 1 flows into a pond and Provincially Significant Wetland within the central portion of the Subject Property.

Two site visits were completed in 2019 to assess the functions of the HDF features 1, 2 and 3 and two site visits were completed in 2020 to assess HDF 4 and HDF 5. The first assessment was completed shortly after main snow melt (some snow was still present on the ground) during the spring freshet and the second visit occurred mid-spring. The focus of the second visit was to assess flow conveyance within the features. It should be noted that the spring of 2019 experience above average precipitation and cooler than typical temperatures. Under these conditions it would be expected that HDFs may convey flow for a longer period of time than would be typically encountered in a climate normal year.

Aerial imagery of the Study Area was reviewed prior to commencing the field assessments to determine potential HDF features within the Study Area. In total five features were identified as potential HDFs requiring an assessment and were investigated in the field. In the field one HDF (HDF 2) was split into two reaches for assessment due to the distinctly differing adjacent land conditions, so in total six HDF reach assessments were completed (Figure 2).

HDF 1

HDF 1 is the largest of the three HDFs identified on the property as it conveys flow from a fairy large upstream catchment area. Based on the NPCA watercourse mapping layer, the channel would be classified as a Second Order channel. The feature was flowing during both the March and April visits. Channel form is generally described as a single thread channel with numerous locations of braided channel. The braiding of the channel is likely the result of a lack of riparian vegetation, which if present would help to maintain better channel definition. The majority of the channel showed evidence of sediment transport, most notably sediment erosion and transport, with only limited areas of sediment deposition. An old well was located adjacent to the channel and it appears that groundwater is close to the surface at this location with potential groundwater seeps along the bank.

HDF 2 and HDF 2a

HDF 2 is located within a small woodlot located in the southwest corner of the property. It appears that the channel has been dug as it is uniform in size and depth, it is straight and excavated fill was located on the east side of the channel. Flow was observed in the channel during both the March and April visits. All flow was coming from a pipe located at the edge of the woodlot (upstream extent of the channel), likely from tile drains in the adjacent farm fields. HDF 2a is located upstream of the woodlot within the cropped agricultural field. There was no defined channel upstream of the woodlot and no surface flow occurring during either visit.

HDF3

HDF 3 originates in the north east corner of the Subject Property. It has a small catchment area and as a result is a small feature. No flow was present during either the March or the April site visits. There is no defined channel and the feature is cropped through.

HDF 4

This is a small feature originating west of a farm lane in a field of willow (grown for cuttings). Flow is conveyed east towards the property limit, then flows north until it confluences with the pond outlet channel. Minimal flow was observed (approximately 0.2 L/s) during the March visit and no flow or standing water was observed during the June 1st visit. Reed canary grass was growing throughout the channel, as a result the channel was stable and with no signs of instability observed.

HDF 5

Within the Subject Property, this channel has a very small catchment and as a result conveys limited flow. The HDF is ploughed through and has no defined channel. No flow was present during the March visit with only minor standing water present and the feature was dry in June. Despite the flow being conveyed over bare soil, no indicators of sediment transport were observed. The channel becomes more defined off-site within the forest community, however flow was not present during either the March or June visits.

4.2.1.1. HDF CLASSIFICATION

The 2014 HDF Guidelines provides a classification system for the HDF features based on the field data collected. The classification involves a four-step process which considers hydrology, riparian vegetation, fish habitat and terrestrial habitat. These four classification steps are then used to assign a recommended management approach. Table 3 below provides a summary of the classification for each of the HDFs found on the Subject Property.

Table 3. Headwater Drainage Feature Guidelines Classification System.

Drainage Feature Segment	STEP 1		STEP 2	STEP 3	STEP 4	Management Recommendation
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat	
HDF 1	Valued Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	Mitigation
HDF 2	Valued Functions	Channelized through woodlot	Important Functions	Contributing Functions	Contributing Functions	Conservation
HDF 2a	Limited Functions	Agriculture, likely tile drained	Limited Functions	Contributing Functions	Limited Functions	No Management Required
HDF 3	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required
HDF 4	Limited Functions	Agriculture	Valued Functions	Contributing Functions	Valued Functions	Mitigation
HDF 5	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required

4.3. VEGETATION

4.3.1. ECOLOGICAL LAND CLASSIFICATION

Table 4 provides a summary of the characteristics of each vegetation community within the study area, as shown on Figure 2, including dominant species, canopy structure, soil texture and moisture regime, and unique ecological features or functions. Photos of these polygons are provided in Appendix C.

A total of 35 polygons were identified, representing anthropogenic uses (agriculture, hedgerow, residential), cattail marsh (mineral shallow marsh), Reed-canary meadow marsh, open water (shallow floating-leaved aquatic), willow swamp, cultural woodland, cultural thicket, and Sugar Maple – Beech and Sugar Maple – Basswood deciduous forests. Table 4 provides a summary of the species associated with these vegetation communities and additional characteristics.

The wetland vegetation communities include:

- Polygons 3, 5.2, 8, 19.1 and 22– Reed-canary grass mineral meadow marshes (within 20 Mile Creek Wetland Complex);

- Polygons 5.3 and 29 – a willow mineral deciduous swamp and red-osier thicket swamp complex located adjacent to the shallow aquatic pond in the northeast corner of the property as well as along the downstream watercourse (within 20 Mile Creek Wetland Complex);
- Polygons 5.4 and 11 – Cattail mineral shallow marsh located adjacent to the shallow aquatic pond and the deciduous forest in the southwest corner of the site respectively (5.4 within 20 Mile Creek Wetland Complex), and;
- Polygon 5.1 - Duckweed Floating-leaved Shallow Aquatic pond located in the northeast corner of the property, surrounded by cultural woodlands or swamp/wetland vegetation communities (within 20 Mile Creek Wetland Complex).

The boundaries of wetland polygons 3 (PSW), 5.1 – 5.4 (PSW), and 11 (non-PSW) were confirmed with NPCA staff on August 6th, 2019, as shown on Figure 2. Polygons 28, 29, and 19.1 were confirmed with NPCA and the City on June 30, 2022. Polygon 8 was not confirmed but is more than 120m from the proposed development, as are 19.1, 28, and 29 The revised and former boundaries of each PSW feature are shown on Figure 2. The western boundary of polygon 3 (MAM2-2) was revised slightly to reflect the wetland-upland transition more accurately. The boundaries of the pond and adjacent marsh and thicket swamp communities (polygon 5 inclusive) were more extensively revised. On the north side the boundaries were extended to the limit of the agricultural field. On the south side the boundary was pulled in towards the pond due to the present of upland areas associated with fill excavated from the pond and intervening upland meadow areas. Polygon 13 was formerly Mineral Meadow Marsh but was excluded from the wetland due to lack of wetland vegetation indicator species and hydric soils. Polygons 22 and 28 were formerly within polygon 13 and remain wetland.

Both cultural woodlands and more natural deciduous forests are present within the Study Area. Dry-Fresh Sugar Maple – Beech deciduous forests are in the southwest corner of the property, adjacent to Dickenson Road and anthropogenic areas (single family residential), and in the northeast corner of the Study Area within the adjacent properties. The boundaries of these two forests shown on Figure 2 were delineated based on dripline extent with City staff. Cultural woodlands are also present around the large shallow aquatic pond in the central portion of the Study Area. Polygon 6.1 contains an access road and is relatively manicured with mature planted trees. As a result of informal landscaping around a small cabin (e.g. mowing) and the access road, this feature lacks the understorey, shrub layer, and ground layers of a natural or successional woodland community. Woodland polygons 6.2 and 6.3 have formed over areas where fill was deposited from excavation of the pond (polygons), as shown on Figure 2. The cultural woodland, pond, and associated wetlands are connected to the Dry-Fresh Sugar Maple Beech Forest and wetlands within via polygon 14. This polygon is an over-grown hedgerow that has succeeded into the meadow marsh to the east (polygon 13). Hedgerows also border the northern and western portions of the study area, providing connectivity to polygon 10 within the southwestern corner of the Study Area. The woodlands and hedgerows bordering the Subject Property are considered linkages according to the Hamilton OP.

Overall, the vast majority of the Subject Property and Study Area have been impacted by historic and current agricultural/anthropogenic disturbance and uses. As such, the cultural and agricultural communities are dominated by exotic vegetation. The mature woodlands and wetland communities generally support a high diversity of both native and exotic species.

All of the ELC communities observed are common in the City of Hamilton.

Table 4. Summary of Vegetation Communities Identified within the Dickenson Study Area.

Polygon Number	ELC Community Code	ELC Community Description	Size (ha) within study Area	Dominant or Abundant Species				Comments
				Canopy (10 m – >25m)	Subcanopy (2m – 10m)	Understory/ Shrub Layer (1m – 2 m)	Groundcover (<1m)	
1.1 1.2	AGR	Agricultural	21.19	Black Walnut (*Juglans nigra*)		Red raspberry (*Rubus ideaeus*), Gray Dogwood (*Cornus racemosa*), Common Buckthorn (*Rhamnus cathartica*)	Canadian Fleabane (*Erigeron canadensis*), Kentucky Bluegrass (*Poa pratensis*), Annual Ragweed (*Ambrosia artemisiifolia*), Common Dandelion (*Taraxacum officinale*), Wild Strawberry (*Fragaria virginiana*), New England Aster (*Symphyotrichum novae-angliae*), Wild Carrot (*Daucus carota*), Mouse-ear Chickweed (*Cerastium fontanum*)	Agricultural field planted with soybean (*Glycine max*). Western half of the property is primarily agricultural field, as well as the northeast quarter of the study area.
2	HR	Hedgerow	0.35	Trembling Aspen (*Populus tremuloides*), Basswood (*Tilia americana*), Sugar Maple (*Acer saccharum*)		Red raspberry (*Rubus ideaeus*), Gray Dogwood (*Cornus racemosa*), Multiflora Rose (*Rosa multiflora*), Chokecherry (*Prunus virginiana*), Riverbank Grape (*Vitis riparia*), Tatarian Honeysuckle (*Lonicera tatarica*)	Smooth Brome (*Bromus inermis*), Canada Goldenrod (*Solidago canadensis*), Bird's-foot Trefoil (*Lotus corniculatus*), Wild Carrot (*Daucus carota*), Hawkweed Oxtongue (*Picris hieracioides*), New England Aster (*Symphyotrichum novae-angliae*), Reed Canary Grass (*Phalaris arundinacea*), Tansy (*Tanacetum vulgare*)	Hedgerow located between two cultural thickets in southeast portion of study area, runs along driveway into back of property.
3	MAM2-2	Reed-canary Grass Mineral Meadow Marsh	0.67			Black Walnut (*Juglans nigra*), Red-osier Dogwood (*Cornus stolonifera*)	Reed Canary Grass (*Phalaris arundinacea*), Narrow-leaved Cattail (*Typha angustifolia*), Kentucky Bluegrass (*Poa pratensis*), Grass-leaved Goldenrod (*Euthamia graminifolia*), Panicled Aster (*Symphyotrichum lanceolatum*) Cattail Marsh Inclusion: Narrow-leaved Cattail (*Typha angustifolia*)	No standing water present in 2019.
4	CUS1	Mineral Cultural Savannah	1.02	Sugar Maple (*Acer saccharum*), Basswood (*Tilia americana*), Black Walnut (*Juglans nigra*)	Sugar Maple (*Acer saccharum*), Basswood (*Tilia americana*), Black Walnut (*Juglans nigra*)	Gray Dogwood (*Cornus racemosa*), Common Buckthorn (*Rhamnus cathartica*), Riverbank Grape (*Vitis riparia*). *Crataegus coccinea s.l.*	Creeping Wildrye (*Elymus repens*), Canada Goldenrod (*Solidago canadensis*), Common Timothy (*Phleum pretense),* Great Ragweed (*Ambrosia trifida*), Yellow Wood-sorrel (*Oxalis stricta*)	Located in the centre of the north half of the property and impacted by anthropogenic uses. Former farmhouse and landscape areas in introduced horticultural species (e.g. *Rudbeckia fulgida*) .
5.1	SAF1-3	Duckweed Floating-leaved Shallow Aquatic	0.96			Common Cattail (*Typha latifolia*), Narrow-leaf Cattail (*Typha angustifolia*)	Lesser Duckweed (*Lemna minor*), Purple Loosestrife (*Lythrum salicaria*), Nodding Beggarticks (*Bidens cernua*)	Dominance of Lemna and algae suggest excessive nutrients.
5.2	MAM2-2	Reed-canary Grass Mineral Meadow Marsh	0.05			Bebb's Willow (*Salix bebbiana*)	Reed Canary Grass (*Phalaris arundinacea*), Panicled Aster (*Symphyotrichum lanceolatum*), Fox Sedge (*Carex vulpinoidea*), Red-osier Dogwood (*Cornus stolonifera*), Riverbank Grape (*Vitis riparia*), Crested Sedge (*Carex cristatella*), Dark-green Bulrush (*Scirpus atrovirens*)	Reed Canary Grass froms near monoculture. The hydrology of this wetland is dependent on the water level in the pond (polygon 5.1). No seepage or groundwater flow from the adjacent uplands is apparent.
5.3	SWD4-1	Willow Mineral Deciduous Swamp/ Red-osier Thicket Swamp Complex	0.72	Willow Species (*Salix* sp.), Black Walnut (*Juglans nigra*),	Willow Species (*Salix* sp.), Black Walnut (*Juglans nigra*), Norway Spruce (*Picea abies*)	Red-osier Dogwood (*Cornus stolonifera*), Black Raspberry (*Rubus occidentalis*), Riverbank Grape (*Vitis riparia*), Common Red Raspberry (*Rubus idaeus*)	Jewelweed (*Impatiens capensis*), Panicled Aster (*Symphyotrichum lanceolatum*), Purple Loosestrife (*Lythrum salicaria*), Canada Goldenrod (*Solidago canadensis*), Broad-leaved Enchanter's Nightshade (*Circaea canadensis*), Sensitive Fern (*Onoclea sensibilis*)	Tree canopy patchy and dominated by exotic trees. Shrub layer and ground cover relatively diverse with native species. The hydrology of this

Polygon Number	ELC Community Code	ELC Community Description	Size (ha) within study Area	Dominant or Abundant Species				Comments
				Canopy (10 m – >25m)	**Subcanopy (2m – 10m)**	**Understory/ Shrub Layer (1m – 2 m)**	**Groundcover (<1m)**	
				Norway Spruce (*Picea abies*)				wetland is dependent on the water level in the pond (polygon 5.1). No seepage or groundwater flow from the adjacent uplands is apparent.
5.4	MAS2-1	Cattail Mineral Shallow Marsh	0.11		Bebb's Willow (*Salix bebbiana*), Riverbank Grape (*Vitis riparia*), Red-osier Dogwood (*Cornus stolonifera*)	Narrow-leaf Cattail (*Typha angustifolia*), Common Cattail (*Typha latifolia*), Reed Canary Grass (*Phalaris arundinacea*), Jewelweed (*Impatiens capensis*)	Sensitive Fern (*Onoclea sensibilis*), Soft Rush (*Juncus effuses*), Lesser Duckweed (*Lemna minor*), Dudley's Rush (*Juncus dudleyi*), Dark-green Bulrush (*Scirpus atrovirens*)	The hydrology of this wetland is dependent on the water level in the pond (polygon 5.1). No seepage or groundwater flow from the adjacent uplands is apparent.
6.1 6.2 6.3 6.4	CUW1	Mineral Cultural Woodland	0.69	Sugar Maple (*Acer saccharum*), Black Walnut (*Juglans nigra*), Eastern Cottonwood (*Populus deltoides*), White Spruce (*Picea glauca*)	Trembling Aspen (*Populus tremuloides*), Eastern Cottonwood (*Populus deltoides*), Basswood (*Tilia americana*). *Crataegus coccinea s.l. (polygon 6.3 only.*	Gray Dogwood (*Cornus racemosa*), Red-osier Dogwood (*Cornus stolonifera*), Riverbank Grape (*Vitis riparia*), Chokecherry (*Prunus virginiana*), Cranberry Viburnum (*Viburnum opulus*)	Canada Goldenrod (*Solidago canadensis*), Wild Carrot (*Daucus carota*), Red Clover (*Trifolium pretense*), Annual Fleabane (*Erigeron annuus*), Kentucky Bluegrass (*Poa pratensis*), Great Ragweed (*Ambrosia trifida*), Reed Canary Grass (*Phalaris arundinacea*),	Mixed species composition including planted trees. Largely the product of anthropogenic influences (e.g. fill, mowing) associated with pond excavation.
7.1 7.2	FOD5-2	Dry-Fresh Sugar Maple – Beech Deciduous Forest	4.16	Sugar Maple (*Acer saccharum*), American Beech (*Fagus grandifolia*), Black Cherry (*Prunus serotina*)	Blue-beech (*Carpinus caroliniana*), American Beech (*Fagus grandifolia*), Sugar Maple (*Acer saccharum*). *Crataegus coccinea s.l.*	Sugar Maple (*Acer saccharum*), Common Red Raspberry (*Rubus idaeus*), Alternate-leaved Dogwood (*Cornus alternifolia*), American Beech (*Fagus grandifolia*)	Broad-leaved Enchanter's Nightshade (*Circaea canadensis*), Yellow Trout-lily (*Erythronium americanum*), Chokecherry (*Prunus virginiana*), Woodland Strawberry (*Fragaria vesca*), Panicled Aster (*Symphyotrichum lanceolatum*)	Potential seepage area feeding water course (See Figure 2). Mature and dying Butternut trees. High diversity of native woodland species.
8	MAM2-2	Reed-canary Grass Mineral Meadow Marsh	0.26	American Elm (*Ulmus americana*), Black Walnut (*Juglans nigra*), Basswood (*Tilia americana*)	Black Walnut (*Juglans nigra*), Basswood (*Tilia americana*), Balsam Poplar (*Populus balsamifera*)	Red-osier Dogwood (*Cornus stolonifera*), Riverbank Grape (*Vitis riparia*), Common Elderberry (*Sambucus canadensis*), Jewelweed (*Impatiens capensis*)	Reed Canary Grass (*Phalaris arundinacea*), Canada Goldenrod (*Solidago canadensis*), Panicled Aster (*Symphyotrichum lanceolatum*), Marsh Blue Violet (*Viola cucullata*) Small-flowered Willowherb (*Epilobium parviflorum*), Sensitive Fern (*Onoclea sensibilis*)	The hydrology of this feature is partially dependent on HDF3. Some overland flow or seepage from upland areas in polygon 7.1 and 7.2 is also likely. This features is contiguous with downstream wetlands outside the study area.
9.1	HR	Hedgerow	0.14	Sugar Maple (*Acer saccharum*), Basswood (*Tilia americana*)	Sugar Maple (*Acer saccharum*), Basswood (*Tilia americana*)	Gray Dogwood (*Cornus racemosa*), Common Buckthorn (*Rhamnus cathartica*), Sugar Maple (*Acer saccharum*). *Crataegus coccinea s.l.*	Canada Goldenrod (*Solidago canadensis*), New England Aster (*Symphyotrichum novae-angliae*), Smooth Brome (*Bromus inermis*), Jewelweed (*Impatiens capensis*), Hawkweed Oxtongue (*Picris hieracioides*)	Relatively broad hedgerow runs along the majority of the western and northern boarders to the property. Planted in 1880's according to former landowner (A. French, Pers. Comm.).

Polygon Number	ELC Community Code	ELC Community Description	Size (ha) within study Area	Dominant or Abundant Species				Comments
				Canopy (10 m – >25m)	Subcanopy (2m – 10m)	Understory/ Shrub Layer (1m – 2 m)	Groundcover (<1m)	
9.2	HR	Hedgerow	1.6	Basswood (*Tilia americana*), Sugar Maple (*Acer saccharum*), Chokecherry (*Prunus virginiana*)	Black Walnut (*Juglans nigra*)	Gray Dogwood (*Cornus racemosa*), Riverbank Grape (*Vitis riparia*), Swamp Redcurrant (*Ribes triste*), Multiflora Rose (*Rosa multiflora*), Red-osier Dogwood (*Cornus stolonifera*). *Crataegus coccinea s.l.*	Broad-leaved Enchanter's Nightshade (*Circaea canadensis*), May-apple (*Podophyllum peltatum*), Herb Robert (*Geranium robertianum*), Great Ragweed (*Ambrosia trifida*), Yellow Wood-sorrel (*Oxalis stricta*), Chicory (*Cichorium intybus*)	Central hedgerow runs partially down the middle of the property between two agricultural fields. Similar to polygn 9.1.
10	FOD5-2	Dry-Fresh Sugar Maple – Beech Deciduous Forest	1.39	Sugar Maple (*Acer saccharum*), American Beech (*Fagus grandifolia*)	Basswood (*Tilia americana*)	American Beech (*Fagus grandifolia*), White Ash (*Fraxinus americana*)	Broad-leaved Enchanter's Nightshade (*Circaea canadensis*), Wild Strawberry (*Fragaria virginiana*), Jewelweed (*Impatiens capensis*), Fowl Manna Grass (*Glyceria striata*), Beechdroops (*Epifagus virginiana*)	Potential seepage area in small hollow. Relatively low diversity of species due to extensive shade provided by American Beech and Sugar Maple.
11	MAS2-1	Cattail Mineral Shallow Marsh	0.11		Black Walnut (*Juglans nigra*)	Narrow-leaf Cattail (*Typha angustifolia*), Common Cattail (*Typha latifolia*), Panicled Aster (*Symphyotrichum lanceolatum*), Reed Canary Grass (*Phalaris arundinacea*)	Reed Canary Grass (*Phalaris arundinacea*), Jewelweed (*Impatiens capensis*), Creeping Bentgrass (*Agrostis stolonifera*)	Small wetland along water course with depression forming small pond (appox 10m2). The hydrology of these features is linked to flows from HDF2, including a small seepage areas (See Figure 2).
12	ANTH	Anthropogenic	0.93	Sugar Maple (*Acer saccharum*), Manitoba Maple (*Acer negundo*), Norway Spruce (*Picea abies*), White Spruce (*Picea glauca*)			Brown-headed Coneflower (*Rudbeckia triloba*), Smooth Brome (*Bromus inermis*), Canada goldenrod (*Solidago canadensis*)	
13	CUM1	Mineral Cultural Meadow	2.99	Peachleaf Willow (*Salix amygdaloides*), Eastern Cottonwood (*Populus deltoides*)	Trembling Aspen (*Populus tremuloides*)	Reed Canary Grass (*Phalaris arundinacea*), Canada Goldenrod (*Solidago canadensis*), White Sweetclover (*Melilotus alba*)	Kentucky Bluegrass (*Poa pratensis*), Wild Strawberry (*Fragaria virginiana*), Canada Goldenrod (*Solidago canadensis*), Wild Carrot (*Daucus carota*), White Sweetclover (*Melilotus alba*), Bird Vetch (*Vicia cracca*)	Was previously mapped as wetland but excluded in 2022 based on lack of wetland vegetation indicator species and hydric soils.
14	FOD5-6	Dry-Fresh Sugar Maple – Basswood Deciduous Forest	1.5	Black Walnut (*Juglans nigra*), Basswood (*Tilia americana*), Sugar Maple (*Acer*	Black Walnut (*Juglans nigra*), Basswood (*Tilia americana*), Black Cherry (*Prunus serotina*). *Crataegus coccinea s.l.*	Red raspberry (*Rubus ideaeus*), Riverbank Grape (*Vitis riparia*), Red-osier Dogwood (*Cornus stolonifera*), Gray Dogwood (*Cornus racemosa*)	Broad-leaved Enchanter's Nightshade (*Circaea canadensis*), Virginia Waterleaf (*Hydrophyllum virginianum*), Dame's Rocket (*Hesperis matronalis*), Wild Strawberry (*Fragaria virginiana*), Cleavers (*Galium aparine*)	Provides connectivity between other features. Old dug channel likely provides seasonal flow southward to main tributary.

Polygon Number	ELC Community Code	ELC Community Description	Size (ha) within study Area	Dominant or Abundant Species				Comments
				Canopy (10 m – >25m)	Subcanopy (2m – 10m)	Understory/ Shrub Layer (1m – 2 m)	Groundcover (<1m)	
				saccharum), Black Cherry (*Prunus serotina*)				
15.1 15.2	HR	Hedgerow	0.14	Pringle's Hawthorn (*Crataegus coccinea var. pringlei*), Black Walnut (*Juglans nigra*), Manitoba Maple (*Acer negundo*)	Pringle's Hawthorn (*Crataegus coccinea var. pringlei*)	Pringle's Hawthorn (*Crataegus coccinea var. pringlei*), Gray Dogwood (*Cornus racemosa*), Red-osier Dogwood (*Cornus stolonifera*)	Broad-leaved Enchanter's Nightshade (*Circaea canadensis*), White Avens (*Geum canadense*), Canada Goldenrod (*Solidago canadensis*), Reed Canary Grass (*Phalaris arundinacea*), Kentucky Bluegrass (*Poa pratensis*), Wild Strawberry (*Fragaria virginiana*)	Very similar to polygon 9.1.
16.1	CUT1	Mineral Cultural Thicket	3.96	Exotic willows and dogwoods planted for ornamental "pussy willow" production.				Exotic/non-native pussy willow cultural thicket.
16.2	CUT1	Mineral Cultural Thicket	1.63	Eastern Cottonwood (*Populus deltoides*), Non-native Pussy Willow (*Salix* sp.)				Exotic/non-native pussy willow cultural thicket.
17	CUM1-1	Dry-Moist Mineral Cultural Meadow	1.62	Black Walnut (*Juglans nigra*), Eastern Cottonwood (*Populus deltoides*), White Spruce (*Picea glauca*)		Reed Canary Grass (*Phalaris arundinacea*), Canada Goldenrod (*Solidago canadensis*), Great Ragweed (*Ambrosia trifida*), Smooth Brome (*Bromus inermis*)	Kentucky Bluegrass (*Poa pratensis*), Canada Goldenrod (*Solidago canadensis*), Reed Canary Grass (*Phalaris arundinacea*), Wild Strawberry (*Fragaria virginiana*)	Some areas likely fill associated with pond excavation.
18	ANTH	Anthropogenic	0.27	Black Walnut (*Juglans nigra*), Basswood (*Tilia americana*), Sugar Maple (*Acer saccharum*)	Sugar Maple (*Acer saccharum*), Basswood (*Tilia americana*)	Sugar Maple (*Acer saccharum*), Basswood (*Tilia americana*), Staghorn Sumac (*Rhus typhina*), Gray Dogwood (*Cornus racemosa*)	Canada Goldenrod (*Solidago canadensis*), Wild Strawberry (*Fragaria virginiana*), Hooked Agrimony (*Agrimonia gryposephala*), Field Horsetail (*Equisetum arvense*), Broad-leaved Enchanter's Nightshade (*Circaea canadensis*), Arrow-leaved Aster (*Symphyotrichum urophyllum*), White Avens (*Geum canadense*)	Area is mainly mowed with small woodland pockets.
19.1	MAM2-2	Reed-canary Grass Mineral Meadow Marsh	0.1	Surrounding canopy from Polygon 7.1	Surrounding subcanopy from Polygon 7.1 overlaps this polygon.	Surrounding understory from Polygon 7.1 overlaps this polygon.	Reed Canary Grass (*Phalaris arundinacea*), Canada Goldenrod (*Solidago canadensis*), Panicled Aster (*Symphyotrichum lanceolatum*), Marsh Blue Violet (*Viola cucullata*) Small-	The hydrology of this feature is partially dependent on HDF3. Some overland flow and seepage from upland areas in

Polygon Number	ELC Community Code	ELC Community Description	Size (ha) within study Area	Dominant or Abundant Species				Comments
				Canopy (10 m – >25m)	Subcanopy (2m – 10m)	Understory/ Shrub Layer (1m – 2 m)	Groundcover (<1m)	
				overlaps this polygon.			flowered Willowherb (*Epilobium parviflorum*), Sensitive Fern (*Onoclea sensibilis*), Blue Vervain (*Verbena hastata*).	polygon 7.1 is also likely. This feature is contiguous with downstream wetlands outside the study area.
22	MAM2-2	Reed-canary Grass Mineral Meadow Marsh	0.26	*Salix* species (exotic willows)	Canada Elderberry (*Sambucus canadensis*) Dotted Hawthorn (*Crataegus punctata*)	Red-osier Dogwood (*Cornus sericea*), Reed Canary Grass (*Phalaris arundinacea*), Narrow-leaved Cattail (*Typha angustifolia*),	Spotted Jewelweed (*Impatiens capensis*), Kentucky Bluegrass (*Poa pratensis*)	Originates below culvert outlet from pond. Mostly a narrow riparian marsh along watercourse, dominated by Reed Canary Grass, but broader and more diverse at west end by woodland.
23.1 23.2	CUW1	Mineral Cultural Woodland	0.71	Black Walnut (*Juglans nigra*)	Gray Dogwood (*Cornus racemosa*)	Exotic Roses (*Rosa* sp), Honey Suckle (*Lonicera* sp)	Kentucky Bluegrass (*Poa pratensis*), Orchard Grass (Dactylus glomerata)	No permission to access this property, therefore assessment of vegetation limited.
24.1	CUT1-4	Gray Dogwood Cultural Thicket	0.03			Gray Dogwood (*Cornus racemosa*)	Kentucky Bluegrass (*Poa pratensis*)	No permission to access this property, therefore assessment of vegetation limited.
26	HR	Hedgerow	0.08	Black Walnut (*Juglans nigra*), Sugar Maple (*Acer saccharum*)	Domestic Apple (*Malus communis*)	Gray Dogwood (*Cornus racemosa*)	Kentucky Bluegrass (*Poa pratensis*)	No permission to access this property, therefore assessment of vegetation limited.
28	SWD4	Mineral Deciduous Swamp	0.08	Willow (*Salix alba/fragilis*)	Black Walnut (*Julgans nigra*), Pringle's Hawthorn (*Crataegus coccinea var. pringlei*)	Red-osier Dogwood (*Cornus sericea*), Reed Canary Grass (*Phalaris arundinacea*	Thicket Creeper (*Parthenocissus inserta*), Dame's Rocket (*Hesperis matronalis*)	Small depressional area. Very little ground cover. Some seasonal flooding in spring.
29	SWT2-5	Red-osier Mineral Thicket Swamp	0.06	*Peach-leaved Willow (Salix amygdaloides*)	Black Willow (*Salix nigra*)	Red-osier Dogwood (*Cornus sericea*), Sandbar Willow (Salix interior) Reed Canary Grass (*Phalaris arundinacea)*, Riverbank Grape (*Vitis riparia*)	Spotted Jewelweed (*Impatiens capensis*), Narrow-leaved Cattail (*Typha angustifolia*), Green Bulrush (*Scirpus atrovirens*)	Thicket-dominant riparian wetland.

4.3.2. BOTANICAL INVENTORY

During the Botanical inventories, a total of 254 vascular plants were observed. A complete list of species observed is provided in Appendix E. Of the 226 plants identified to species level, 156 (68%) are native to Ontario and 72 (32%) are introduced. Twenty-seven (26) species could only be identified to genus level due to immaturity or lack of identifiable features at the time of the survey. Seven (7) species of plant were observed which are significant at the federal, provincial, or local level (Table 5).

Table 5. Provincially and locally significant plants.

Scientific Name	Common Name	COSEWIC 2019	SARO 2019	SRank	Hamilton 2014	Polygons (See Figure 2)
Ambrosia trifida	Great Ragweed				Uncommon	4,5,6,7,8,9.1, 22
Carex alopecoidea	Foxtail Sedge			S4	Uncommon	11
Ceratophyllum demersum	Common Hornwort				Uncommon	5.1
Crataegus coccinea var. coccinea	Scarlet Hawthorn				Rare	9,10
Crataegus coccinea var. pringlei	Pringle's Hawthorn				Uncommon	4,6.3,7.1,9.1, 9.2, 14,15.1
Juglans cinerea	Butternut	END	END	S2?		Polygons 7.1, 7.2, 9.1, 14
Rudbeckia fulgida	Orange Coneflower			S1		Planted/Garden Escape in Polygon 4 (around former farmhouse)

A summary of species richness and Floristic Quality Assessment is provided in Table 6. In general, native species richness was highest within the woodland/forest polygons and wetlands, whereas agricultural and anthropogenic areas were the lowest. Floristic quality indices were highest for the Deciduous Forest ELC communities (polygons 7, 10, 14), but hedgerows (polygon 9) were also notable. Overall polygons 7.1/7.2, 10, and 14 contained the richest vegetation communities in terms of diversity and the number of conservative plants species. Mean wetness values corresponded well to the ELC vegetation types; wetland polygons all had values below 0 and most upland polygons had values greater than 0. Exceptions include polygon 13 (CW = 0.7) which reflected the more mesic than wetland conditions and species composition observed (See Section 4.3.1) and polygons 16 (CW = -1) which likely reflects the wetland transition areas within polygon 16.2.

Table 6. Summary of species richness and Floristic Quality Assessment for each ELC polygon.

Attribute		Native Status				Floristic Quality Assessment			
		I	N	Total**	(%)**	Mean CW	Sum CC	Mean CC	FQI
Polygon	1	18	12	30	40	1.4	17	0.6	3.1
	2	12	18	30	60	1.5	29	1.0	5.3
	3	2	16	18	89	-1.4	34	1.9	8.0
	4	23	36	59	61	1.8	81	1.4	10.5
	5	9	34	43	79	-2.1	103	2.4	15.7
	6	30	55	85	65	1.6	165	1.9	17.9
	7	18	87	105	83	0.9	331	3.2	32.3
	8	3	23	26	88	-1.9	80	3.1	15.7
	9	20	57	77	74	1.3	164	2.1	18.7
	10	0	24	24	100	1.7	92	3.8	18.8
	11	3	14	17	82	-2.7	49	2.9	12
	13	9	21	30	70	0.7	43	1.4	7.9
	14	4	38	42	90	1.1	132	3.1	20.4
	15	2	21	23	91	-0.3	52	2.3	10.8
	16	0	1	1	100	-1.0	4	4.0	4.0
	17	16	19	35	54	2.0	40	1.1	6.8

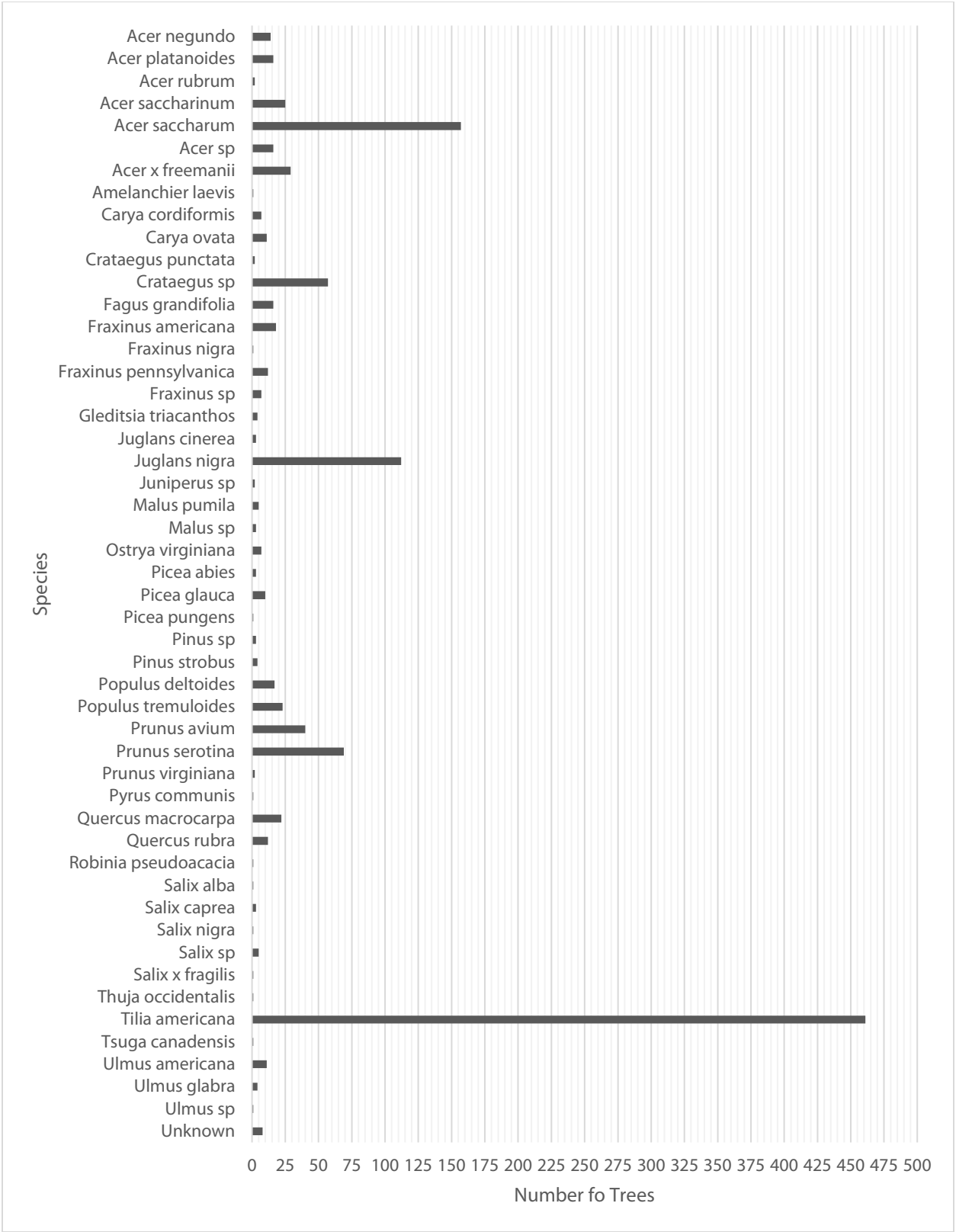
	18	2	15	17	88	2.5	43	2.5	10.4

4.3.3. TREE INVENTORY AND ARBORIST ASSESSMENT

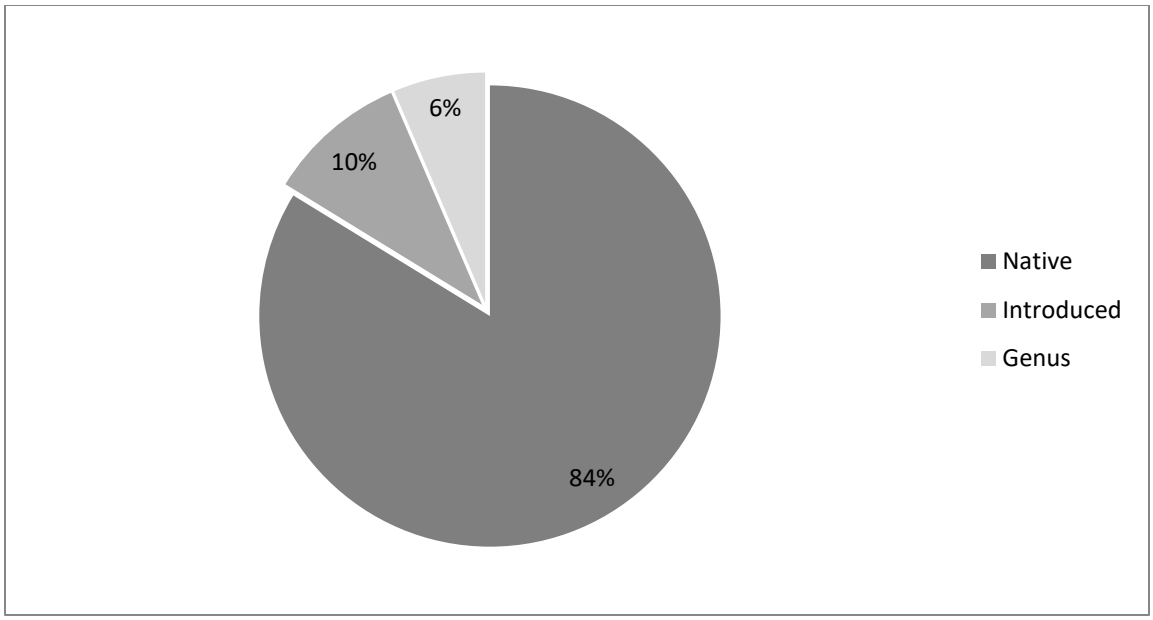
A total of 1292 trees 10 cm DBH or larger were tagged and assessed within the disturbance limit and overlapping natural heritage features. This included hedgerows, woodland edges, and planted trees around the former farmhouse. The locations of these trees are shown on the Figure 3, and the data collected for each tree are provided in Appendix F.

Graph 1 shows the abundance of all 1292 trees surveyed. The most frequently encountered species were American Basswood (*Tilia americana*), followed by Sugar Maple (*Acer saccharum*), Black Walnut (*Jugulans nigra*), Black Cherry (*Prunus serotina*) and Hawthorns (*Crataegus punctata and Crataegus coccinea s.l.*). In general, the surveyed areas were dominated by native species, though several exotic and invasive species were observed, including Norway Maple (*Acer platanoides*), Manitoba Maple (*Acer negundo*), Common Apple (*Malus pumila*), and Sweet Cherry (*Prunus avium*).

Three individuals of the provincially Endangered Butternut (*Juglans cinerea*) were also observed. These trees were all relatively small (<25cm dbh) and in good condition. A Butternut Health Assessment was completed for these trees since they were all within approximately 25m of the proposed development. The data and assessment is provided in Appendix G. Tree #1 was determined to be "archivable", tree #2 was "non-retainable", and tree #3 was "retainable". These trees were determined to be native trees based on morphological characteristics. Several mature Butternuts were also observed within polygon 7.1, which are presumably wild type and the source of these young trees. A Butternut Health Assessment report was submitted to the Ministry of Environment, Conservation, and Parks (MECP) on October 18th, 2019. Confirmation of this report was received on March 2, 2020 (Appendix G).

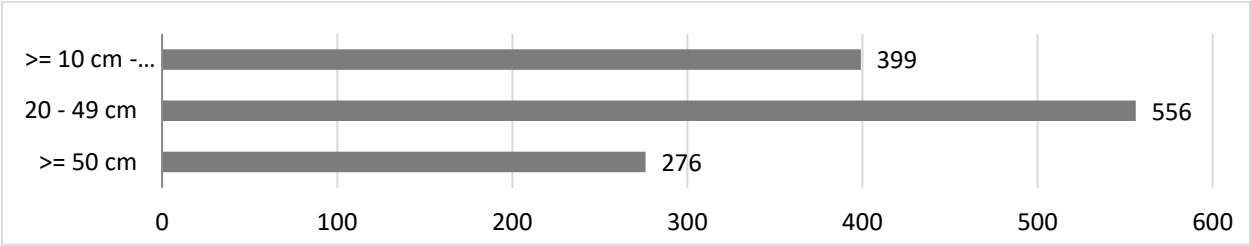


Graph 4. Frequency of tree species observed within areas surveyed.



Graph 5. Proportion of native versus Non-Native Trees.

Trees sizes ranged from 10 cm to 160 cm DBH, with an average size of approximately 28 cm DBH. Most trees were in the range of 20 – 49 cm DBH (Graph 3). The largest living tree (tree 17) was a Bur Oak (*Quercus macrocarpa*) with a DBH of 115 cm.



Graph 6. Size (cm DBH) distribution for trees observed within the study area.

Most trees surveyed were in medium structural condition or medium- high biological health (Table 7). Similarly, most trees received a fair rating according to the City's ranks. Many of the mature Basswood and Sugar Maple trees had structural defects such as cavities or cracks, which placed them in the medium/fair categories. An additional 42 trees were dead. Many of these trees represent good wildlife habitat and were assessed according to MNRF guidelines for assessing bat habitat (leaf-on). The results of these surveys were provided to the Ministry of Conservation, Environment, and Parks in an Information Gathering Form (See Section 4.5). Overall, 844 trees were considered high in terms of their priority for preservation based on these factors combined.

Table 7. Summary of tree conditions for trees observed within the surveyed areas.

Condition*	Structural Condition (No. of Trees)	Biological Health (No. of Trees)	Preservation Priority (No. of Trees)
High/Good	266	669	890
Medium/Fair	787	453	315
Low/Poor (Dead)	141	71	87
TBD	98	99	0
Total	**1292**	**1292**	**1292**

* D&A Rankings/City of Hamilton Tree Protection Guideline Rankings

4.4. WILDLIFE

4.4.1. AMPHIBIAN SURVEYS

Five species of amphibians were detected during the surveys: American Toad (*Anaxyrus americanus*), Spring Peeper (*Pseudacris crucifer*), Green Frog (*Lithobates clamitans*) and Gray Treefrog (*Hyla versicolor*) and Northern Leopard Frog (*Lithobates pipens*). During 2022 surveys, unidentified amphibian larvae were detected at 3 of the survey locations. Details for each species are as follows:

- American Toad – Three individuals were detected on April 24th at station 3. On May 24th, three American Toads were heard from station 5, they were calling from feature away from the station pond that could not be seen on a map.

- Spring Peeper – full choruses were heard at stations 1, 3 and 4 on April 24th, while lower numbers (< 5) were heard on that date at stations 2. No Spring Peepers were detected on May 2th or June 26th.

- Northern Leopard Frog–One individual was heard calling at station 2 on April 24th, 2019 and 4 individuals were heard at station 6. No Northern Leopard Frogs were detected on the other two surveys.

- Green Frog – Low numbers were detected on June 26 at stations; 1,2,3,5 and 6. Two were detected on May 24th at station 5. They were calling from a feature away from the station pond that could not be observed on a map. None were detected on April 24th.

- Gray Treefrog – Single individuals were detected at stations 2 and 5 on June 26th. On May 24th three were detected at station 1 and two were detected at station 2. None were heard on April 24th.

See Map 4 for the location of the nocturnal amphibian survey stations.

4.4.2. BREEDING BIRD SURVEYS

A total of 39 species of birds were detected during the breeding bird surveys and other wildlife surveys in 2019 and 2022; 13 of these species were considered as at least possibly breeding on the site. Four species – Rock Pigeon, Ring-billed Gull, Turkey Vulture and European Starling – were observed flying over the site only and were not considered breeding. Of the 39 species of breeding birds, two of them are considered introduced (non-native): European Starling and Rock Dove. Of the remaining 22 species, three of them are considered Species at Risk (SAR): Barn Swallow (*Hirundo rustica*), Eastern Meadowlark (*Sturnella magna*), and Eastern Wood-pewee (*Contopus virens*). Barn Swallow and Eastern Meadowlark are threatened whereas Eastern Wood-pewee is special concern, at both a federal (COSEWIC 2016) and a provincial level (OMNRF 2017). See the "Species at Risk" section for further details.

At a provincial level, all of the 37 native breeding species have been assigned an Srank of either S4 or S5 by the Natural Heritage Information Centre (NHIC 2019b), which indicates that their provincial populations are "apparently secure" or "secure", respectively (NHIC 2019a). At a local level, 35 of the 39 potentially breeding species are considered common to abundant and widespread in the City of Hamilton (Smith 2014). The four exceptions are Turkey Vulture, Red-bellied Woodpecker, Vesper Sparrow and Eastern Meadowlark which are considered uncommon in Hamilton (Schwetz, 2014).

The Ontario Ministry of Natural Resources and Forestry (OMNR 2000) considered Savannah Sparrow to be area sensitive. This indicates that it requires large areas of suitable habitat (i.e. meadow) for its long-term survival and thus can be sensitive to development. This habitat is concentrated south of the site, in the hydro corridor and beyond. Eastern Meadowlark is also considered area sensitive, requiring large areas of suitable grassland habitat. The individual observed was located outside the study area south of Dickenson Road in the airport grounds which maintains meadow habitat.

The highest level of breeding evidence obtained during the surveys was "confirmed breeding" (OBBA 2001), this is determined by locating a nest with eggs (NE), fledglings in a nest (NY), Adults leaving or entering a nest (AE), recently fledged young (FY), adults carrying food (CF), carrying fecal sac (FS), eggs shells in nest (NU) or adult distraction display (DD). Recently fledged young were observed for American Robin, Baltimore oriole and Red-winged Blackbird.

The next highest level of evidence is "probable" observation of pairs of birds (code P) or territorial males (code T), which is defined as a singing male being present at the same location at least seven days apart. This evidence was the highest level obtained for 19 species. The next highest level of breeding evidence was "possible" breeding (OBBA 2001), as seen with singing males (code S) or birds being present in appropriate breeding habitat during the breeding season (code H); this evidence was the highest breeding level 12 species.

For application of the Migratory Birds Convention Act (MBCA 1994), 32 of the 39 species recorded as at least possibly breeding are protected by the Act. As such, it means that it is illegal to harm or kill these species, or to harm or destroy their nests and nesting habitat. The nine species that are afforded no protection from the Act are American Crow, Blue Jay, Brown-headed Cowbird, European Starling, Red-

tailed Hawk, Red-winged Blackbird, Rock Dove and Wild Turkey. Note that Red-tailed Hawk and Blue Jay are afforded protection by the provincial Fish and Wildlife Conservation Act.

For full details on the breeding bird surveys for this site, please see Appendix H.

4.4.3. REPTILE SURVEYS

One Eastern Garter Snake (*Thamnophis sirtalis sirtalis*) was seen during the visual encounter survey on May 15th, 2019 along the hedgerow in the north east section of the study area. No snakes were detected during the second visual encounter survey on May 29th, 2019. Eastern Garter Snakes were also detected on an incidental bases during other surveys. Two were observed on July 19th, 2019; one was located under a large piece of plywood on the west side of the large pond (polygon 17) and the other was detected in the eastern most field of the study area (polygon 14) (Figures 2 and 4). Two Eastern Garter Snakes were also detected on August 26th, 2019 during the tree inventory. One was located under the large piece of plywood on the west end of the large pond (polygon 17) and the other was observed in the central hedgerow leading north from the pond (Polygon 9.2). Lastly, on September 5th, 2019 one Eastern Garter Snake was detected under the large piece of plywood on the west side of the large pond (polygon 17). No other reptile species were observed during surveys.

4.4.4. FISH HABITAT

Aquatic resources for site include both lotic and lentic environments. The five HDF features assessed all conveyed either ephemeral or intermittent flow, lacked defined channels and generally did not support any fish habitat. All features were identified as not providing direct fish habitat.

The pond feature provides permanent water year-round, has varied depth, shoreline structure is present via trees, shrubs and LWD, and macrophytes are present throughout. Fish were observed utilizing the pond including spawning bluegill (*Lepomus macrochirus*). Bluegill inhabit slow moving, typically well vegetated warm-water bodies, similar to the conditions provided in the on-site pond. As a result, the pond is classified as supporting a warm-water sport fish community.

4.4.5. INCIDENTAL WILDLIFE

No specific surveys were conducted for other wildlife groups, such as mammals and insects. Any sightings of these groups were done on an incidental basis during all other surveys (Appendix I)

Incidental birds were recorded during other surveys, most of the species detected were also recorded during breeding bird surveys. However, a few species detected were not seen during the breeding bird surveys, these included: American Woodcock (*Scolopax minor*), Belted kingfisher (*Megaceryle alcyon*), Black-throated Blue Warbler (*Setophaga caerulescens*) and Double Crested Cormorant (*Phalacrocorax auritus*). Belted Kingfisher is considered uncommon in Hamilton likely due to its more specific habitat and nesting requirements. There is an exposed soil bank on site that could potentially serve as a nesting site for this species. Black-throated Blue Warbler (*Setophaga caerulescens*) is considered rare in Hamilton, however, the individual observed was in mid-May and certainly represents a migrant. Furthermore, there is a lack of appropriate habitat in the study area, as Black-throated Blue Warblers require large tracts of forest with very dense understories. The other birds observed are common species. American Woodcock possibly breeds on site but generally displays in the evening and thus was only detected

during a Nocturnal Amphibian Survey. Double Crested Cormorant was attracted to the pond but would not breed on site as they nest colonially on islands in large bodies of water. Provincially, all these species are considered apparently secure (S4) and secure (S5) by the NHIC. (NHIC, 2019).

All amphibian species observed incidentally were also detected during the Nocturnal Amphibian Surveys all of which are considered to be common species in Hamilton and provincially secure with S Ranks of S5. As far as reptiles are concerned, Eastern Garter Snake (*Thamnophis sirtalis sirtalis*) was the only species detected. See section 4.4.3 for further details.

Six species of butterflies were observed, these included; Black Swallowtail (*Papilio polyxenes*), Least Skipper (*Ancyloxypha numitor*), Monarch (*Danaus plexippus*), Red Admiral (*Vanessa atalanta*), Red-spotted purple and Wild Indigo Duskywing. Black Swallowtail, Least Skipper Red Admiral and Red-spotted Purple are all considered to be locally common with Sranks of S4 and S5. Wild Indigo Duskywing is considered locally uncommon and provincially is considered "apparently secure" with a Srank of 4. Out of all the six species, Monarch is the only species listed as endangered at the federal level (COSEWIC, 2016.) and special concern at the provincial level (ESA, 2007). Monarch is regarded to be a common breeding resident in Hamilton (Schwetz, 2014).

Four species of Odonates were observed as incidentals, three of which are considered common species in Hamilton, these included; Blue Dasher (*Pachydiplax longipennis*), Common Green Darner (*Anax junius*) and Swamp Spreadwing (*Lestes vigilax*). Spotted Spreadwing (*Lestes congener*) is considered uncommon in Hamilton with an S rank of 5, although this species is likely underreported possibly due to its late emergence time.

Two species of mammals were observed during field surveys these were; White-tailed Deer (*Odocoileus virginianus)* and Meadow Vole *(Microtus pennsylvanicus)*. Both of these species are common throughout Southern Ontario and have a provincial Srank of 5.

Lastly, one species of fish was observed as an incidental, that being bluegill (*Lepomis macrochirus*) a species considered to be abundant in Hamilton with a Srank of 5.

4.5. SPECIES AT RISK (SAR) SCREENING

A list of SAR for the City of Hamilton and surrounding areas, updated to August 2018, was provided by Guelph District MNRF. The habitats on site were screened against known habitat requirements of these species to determine if any potential species could be present. The results of this screening are found in Appendix J and are summarized in Table 8. This screening was updated in August 2022 based on field collected in 2022.

Table 8. SAR with potential to be found within study area.

Scientific Name	Common Name	NHIC Srank	Federal status	Provincial status
Birds:				
Hirundo rustica	Barn Swallow	S4	THR	THR
Chaetura pelagica	Chimney Swift	S4	THR	THR
Sturnella magna	Eastern Meadowlark	S4	THR	THR
Contopus virens	Eastern Wood-pewee	S4	SC	SC
Melanerpes erythrocephalus	Red-headed Woodpecker	S4	THR	SC
Hylocichla mustelina	Wood Thrush	S4	THR	SC
Fish:				
Esox americanus	Grass Pickerel	S3	SC	SC
Insects:				
Danaus plexippus	Monarch	S4	END	SC
Reptiles:				
Thamnophis saurita ssp. septentrionalis	Northern Ribbonsnake	S4	SC	SC
Chrysemys picta marginata	Midland Painted Turtle	S4	SC	---
Chelydra serpentina	Snapping Turtle	S3	SC	SC
Plants:				
Juglans cinerea	Butternut	S2	END	END

Considering the location of the site, and the habitats found on site, the potential SAR that could be found during some phase of their life cycle are as follows:

- Barn Swallow– suitable open habitats for foraging are found on site and in adjacent lands. Single birds were observed foraging during both Breeding Bird Surveys.

- Chimney Swift - No birds were observed in 2019 but GeoProcess observed four birds foraging in 2015. There are no suitable structures for nesting on the property but there may be suitable habitat

- Eastern Meadowlark – suitable open habitats are available within 120 meters of the development site. One bird was heard singing on May 29th at least 100 meters south of Dickenson Road and therefore well outside the study area.

- Grass Pickerel - suitable habitat exists in the central pond (polygon 5.1); however, no Grass Pickerel were observed during the aquatic assessments

- Eastern Ribbonsnake – Potential habitat on site (central pond) and adjacent lands. If present, the proposed development site will not adversely impact this species as mitigation measures will be in place; see report for details

- Eastern Wood-Pewee – NHIC record (undated). One bird was heard singing on June 25 only. See report for details.

- Monarch - Small numbers seen during breeding bird surveys. Likely found on site during fall migration but in non-significant numbers. Likely breeds as Common Milkweed is found in disturbed areas of site and adjacent lands.

- Snapping Turtle - likely found in central pond and general area as this species can utilize habitats such as ditches and small watercourses and wetlands. No records for area in the NHIC and MECP databases. However, an individual was observed in 2015 by GeoProcess. The habitat for this species will be preserved and no adverse impacts are anticipated. See report for mitigation measures.

- Wood Thrush - Potential habitat found on site and in adjacent lands. None were detected during 2019 breeding bird surveys. However, a single bird was detected in 2015 by GeoProcess.

Four species of Endangered bats are known from the City of Hamilton: Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*). There is no suitable overwintering habitat (e.g. karst) for any of these four species on site, nor any suitable human-made structures for them to roost in (during migration or for breeding). There are suitable large trees (25+ cm dbh with snags) for maternity roosts located in the in the central portion of the study area (polygons 4 and 9.2), perimeter hedgerows (polygon 9.1), and likely within forested areas within southwest corner of the study area (polygon 10) and northeastern corner of the study area (polygons 7.1, 7.2, and 14), including areas beyond 120 metres from the development site. The locations of potential bat roost trees, based on leaf-on assessment, are shown on Figure 4; see Appendix J for details. A leaf-on assessment of snag trees as completed as part of the tree inventory and assessment and this information was provided to the MECP in the form of an information gathering form on December 12, 2019. Pending further draft plan and site plan revisions, the IGF will be updated and resubmitted accordingly.

4.6. SIGNIFICANT WILDLIFE HABITAT (SWH) SCREENING

During all field investigations, habitats on site were screened against the Significant Wildlife Habitat (SWH) categories contained within the *Significant Wildlife Habitat Technical Guide* (OMNR 2000) and the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (OMNRF 2015).

Of the 38 categories of SWH, none are "Confirmed". Of the 38 categories of SWH, Seven are considered to be "Candidate" within the study area and adjacent lands (within 120 metres):

- Specialized Habitat for Wildlife: Amphibian Breeding Habitat (Wetlands) – wetland breeding habitat for amphibians exists in the large central pond (Stations 2 and 6). four species of frogs were detected calling around the pond; Green Frog, Gray Treefrog and Northern Leopard Frog.

However, 20 individuals were not detected during any visit. Three species were detected in the small marsh located in the southwest (Station 1); Green Frog, Gray Treefrog and Northern Leopard Frog. However, 20 individuals were not detected during any visit.

- Specialized Habitat for Wildlife: Amphibian Breeding Habitat (Woodlands) – woodland breeding habitat for amphibians exists in the southwest (station 1) and northeast woodlands (Stations 4 and 7). Spring peeper was detected at station 1 and 4. Gray Treefrog was only detected at station 1. However, two or more species of frog and 20 individuals were not detected during any visit. These woodlots will not be adversely impacted by the proposed development.

- Specialized Habitat for Wildlife: Turtles Nesting Areas - No turtles nests were observed during surveys. However, potential suitable habitat exists adjacent to the pond feature (Polygon 5.1)

- Specialized Habitat for Wildlife: Seep and Springs – seeps and springs were observed in polygon 7.1 and 10.

- Seasonal Concentration Areas of Animals: Bat Maternity Colonies – suitable habitat, likely with snags present that meet the size (great than 25 cm DBH) and density (10 or more per hectare) thresholds for significance, is present in the southwest woodlot and the woodlot in adjacent lands to the northeast. Note that this habitat is significant for two non-SAR bats only: Big Brown and Silver-haired. SAR bats are protected by the ESA, not SWH per the PPS. These woodlots will not be adversely impacted by the proposed development.

- Seasonal Concentration Areas of Animals: Reptile Hibernaculum – Eastern Garter Snake was observed in polygons 4 and 7.1. It is possible that hibernaculum exist in these polygons as well as in adjacent communities.

- Seasonal Concentration Areas of Animals: Turtle Wintering Area – suitable habitat (i.e., water greater than one meter deep and with a muddy substrate) for overwintering turtles is available in the large central pond. One Snapping Turtle was observed by Geoprocess in 2015 but no turtles were observed in 2019.

- Habitat for Species of Conservation Concern: Special Concern and Rare Wildlife Species (Not Including Endangered or Threatened species) – as discussed in Section 4.4, two Special Concern species were detected: Eastern Wood-Pewee and Monarch. Two other SC are likely present in and around the central wetland (polygon 5.1): Eastern Ribbonsnake and Snapping Turtle. As for plants, Orange Coneflower (*Rudbeckia fulgida*) has a provincial rank of S1; however, this species was a garden escape based on it's proximity to the farmhouse and lack of associated habitat. It is commonly planted and is established in natural areas.

The full SWH screening table is found in Appendix J.

4.7. LINKAGES

4.7.1. LINKAGE IDENTIFICATION

The Urban Hamilton Official Plan (UHOP) identifies Linkage Areas within the study site. These were later refined within the Airport Employment Growth District Secondary Plan, as shown on Figure 1 and Map 1.

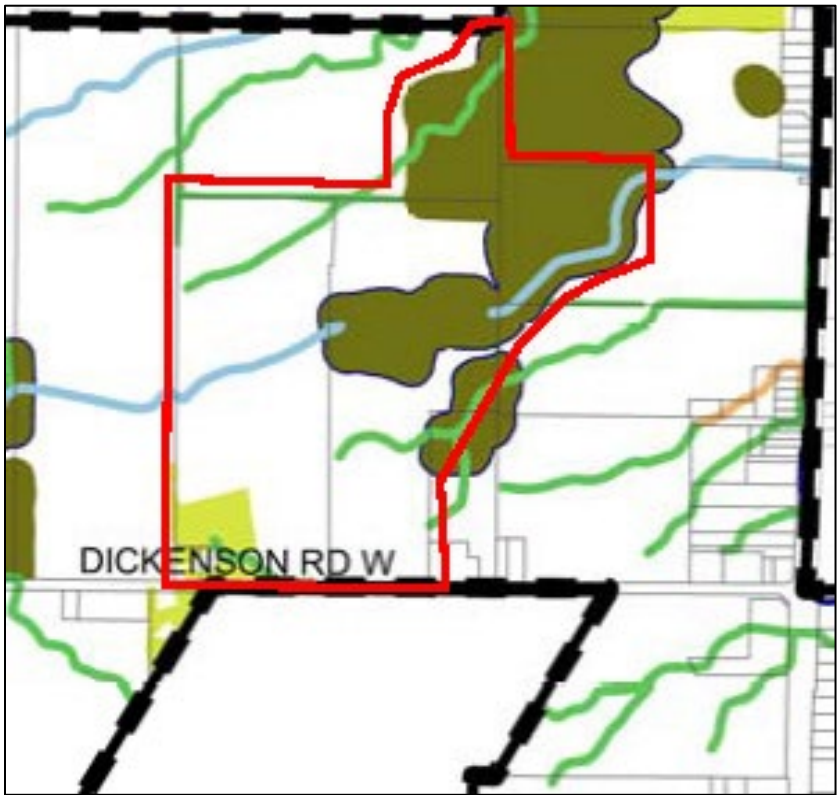


Figure 1. Excerpt from UHOP Map B.8-2, Airport Employment Growth District Secondary Plan Natural Heritage System, showing the approximate study area boundary in red, Core Areas (Dark Green), and Linkages (light green).

The linkage area identified on UHOP Schedule B (Natural Heritage System) include the PSW (polygons 3 and 5.1 – 5.4) and bordering woodlands (polygon 6.1 – 6.4), as well as the contiguous woodlands and PSW bordering the east and northeast edges of the subject property (polygons 7.1, 7.2, 8, 13, 14, 19) and hedgerows along the north and west edges of the subject property (polygon 9.1). In contrast, the AEGD mapping shows the PSW (polygons 3 and 5.1 – 5.4) and bordering woodlands (polygon 6.1 – 6.4), well as the contiguous woodlands and PSW to the northeast and east of the subject property (polygons 7.1, 7.2, 8, 13, 14, 19) as Core Area. The AEGD identifies the woodland in the southwest corner of the study area (polygon 10) as linkage, and the hedgerows bordering the north and west sides of the subject property as Hedgerow Features. This linkage area polygon (10) as well as the hedgerow areas were assessed as part of this EIS and were included in vegetation and wildlife studies for this site. See Map 2 for the ELC community mapping.

4.7.2. LINKAGE FEATURE BOUNDARIES

The boundaries of the linkage features were reviewed with City of Hamilton staff as part of dripline and wetland delineation surveys on August 6th, 2019 (See Section 3.3.3), though the dripline of the hedgerow (polygon 9.1) did not require delineation. Map 2 has been prepared using this information and geo-referenced to the study site and accurately portrays the boundaries of these features. See Section 4.3.1 for more information about the woodland and wetland delineations.

4.7.3. ECOLOGICAL CONDITIONS OF LINKAGE FEATURES

A linkage assessment needs to assess the ecological functions, condition, viability, and integrity of the linkage features, considering connectivity, scale, size, condition, surrounding land use, and any other relevant information. See Section 4.3 for ELC findings and Section 4.4 for wildlife findings.

Polygon 9.1 - Hedgerow

This feature is 1.6 ha in size and is located along the west and north property lines of the site; it is a linear hedgerow ranging in width from approximately 14 to 25m and is approximately 800m in length. This hedgerow provides connectivity between ELC polygon 10, a Dry-Fresh Sugar Maple – Beech Deciduous Forest in the southwest corner of the subject property to ELC polygon 7.1, a Dry-Fresh Sugar Maple Deciduous Forest in the northeast corner of the study area. Another hedgerow connects to this feature at the north-west corner of the site and extends towards Twenty Road West; this portion was not investigated in detail. The ecological condition of this feature is moderate, with a largely mature native tree canopy including Basswood and Sugar Maple but an understory of non-native invasive shrub species dominated by European Buckthorn. There is one existing gap in the canopy cover approximately 35m wide close to the intersection of this feature with community 10. Two stems of one significant tree species, Butternut, were found within this feature close to community 7.1. Several locally significant plants were also present, including Scarlet Hawthorn (*Crataegus coccinea var. coccinea*), numerous Pringles Hawthorn (*Crataegus coccinea var. pringlei*), and Great Ragweed (*Ambrosia trifida)*. The Pringles hawthorn that were large enough were included in the tree survey (See Map 3). Eastern Wood-Pewee was observed incidentally within the vicinity of polygon 9.1 (Figure 4). In terms of functions, this feature provides tree cover for movement between the woodland and several HDFs. This feature may also function as breeding habitat for wildlife species tolerant of edge habitat. Due to its role in connecting woodlands and PSW on the landscape, and relatively high ecological value, polygon 9.1 should be considered a Linkage Feature.

Polygon 10 – Dry-fresh Sugar Maple – Beech Deciduous Forest

This feature is 1.4 ha in size and is in the southwest corner of the study area; it is a Dry-Fresh sugar Maple - Beech Deciduous Forest which is partially located on two adjacent residential lots to the south. This feature is surrounded by agricultural fields to the west, north, and east, is bordered by Dickenson Rd W to the south, and connects to ELC polygon 9.1 (hedgerow) at its northwest corner and is associated with Headwater Drainage Feature 2. The ecological value of this feature is high, with a mature tree canopy dominated by native species and largely native understory tree and shrub species. A portion (0.47 ha) of this forest was removed in 2019 under a permit from the City of Hamilton. One significant bird species,

Eastern Wood Pewee was observed in this habitat during the 2019 Breeding Bird Surveys with evidence of possibly breeding (see Appendix H). This feature may function as potential breeding habitat for wildlife species which require forest habitats. While this feature does likely provide connectivity to woodland areas south of Dickenson Road, it actually meets the criteria for significant woodland (See Section 4.8). Therefore, this feature and the small unevaluated wetland that is contiguous with it should be considered a Core Area rather than Linkage (See Map 5).

4.8. SIGNIFICANT WOODLAND EVALUATION

According to the City's Official Plan definitions (Chapter G, Glossary), Significant woodlands are woodland areas that are ecologically important in terms of:

Species composition, age of trees, stand history;

a) 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; and,
b) Economically important due to site quality, species composition or past management history. (PPS, 2005)

Several woodland features within the study area are shown as Core Areas or Linkages based within the City's natural heritage system (Schedule B). However, these woodland areas are not currently shown as Key Natural Heritage Feature Significant Woodlands on Schedule B-2. According to the City's Official Plan policies and EIS guidelines, woodlands must be evaluated to determine if they meet the Significant Woodland Criteria provided in Chapter G (Glossary). Each forest and woodland area within the study area is evaluated in Table 9 below.

Polygons 6.1, 6.2, 6.3, 6.4, 7/14, and 10 all meet two or more of the criteria require to be consider significant woodlands. The cultural woodlands (6.1, 6.2, 6.3, 6.4) should not be considered significant because they are cultural/anthropogenic in origin and do not also satisfy the definitions above of being ecologically important. While they also do meet the proximity/connectivity and proximity to water criteria because they area adjacent to the PSW, they do not meet the minimum patch size criteria of 2 ha based on 5-10% cover within the planning unit. They are also not highly sensitive features in terms of species composition (i.e. low CC values, generalists, abundant exotic species), will be protected within the 30m Vegetation Protection Zone required around the PSW, and will be protected by 10m VPZs around the individual woodlands.

As per Table 9, polygons 7/14 and 10 meet more than two of the criteria listed, and therefore are considered significant woodlands. As such, they also fit the criteria to be Core Areas within the City's natural heritage system.

Table 9. Significant Woodland Criteria Evaluation.

Criterion	Description	Polygons 6.1, 6.2, 6.3, 6.4	Polygons 7/14	Polygon 10
Size	Minimum patch size of 2 ha, minimum average width of 40m	No (each <<02 ha)	Yes (combined area >4ha excluding contiguous treed areas outside study area). Has minimum average width >40m.	No (1.39 ha). Note: does not include 0.47 ha removed in fall 2019. Total would have been 1.86 ha if removal had not occurred. Has minimum average width >40m.
Interior Forest	Woodlands that contain interior forest habitat. Interior forest habitat is defined as 100 metres from edge.	No	No	No
Proximity/Connectivity	Woodlands that are located within 50 metres of a significant natural area (defined as *wetlands* 0.5 hectares or greater in size, ESAs, PSWs, and Life Science ANSIs)	Yes (proximity to wetlands >.5 ha)	Yes (proximity to wetlands >.5 ha)	No
Proximity to Water	Woodlands where any portion is within 30 metres of any hydrological features, including all streams, headwater areas, wetlands, and lakes.	Yes (wetlands and water course)	Yes (wetlands and watercourse)	Yes (wetlands and watercourse)
Age	Woodlands with 10 or more native trees/hectare greater than 100 years old.	No	Tree age and density not evaluated, but very likely trees >100 years old (Sugar Maple and Beech)	Tree age and density not evaluated, but very likely trees >100 years old (Sugar Maple and Beech)
Rare Species	Any woodland containing threatened, endangered, special concern, provincially,	Yes (locally rare Hawthorns)	Yes (Butternut)	Yes (locally rare Hawthorns)

	or locally rare species.			
Total Criteria met:		**2**	**5**	**3**

4.9. SUMMARY OF ECOLOGICAL FUNCTIONS AND ATTRIBUTES

The study area is primarily agricultural, though it contains a diversity of upland and wetland habitats, both open and forested. Several features support populations of wildlife and plants that are provincially and locally significant, such as Butternut and locally rare Hawthorns. Several woodland and wetland features are locally and/or provincially significant, including:

- Provincially Significant Wetland units (20 Mile Creek PSW, polygons 3, 5, 13);
- Significant Woodlands (polygons 10, 7/14);
- Linkages (hedgerows);
- Candidate Significant Wildlife Habitat (Specialized Habitat for Wildlife: Amphibian Breeding Habitat (Wetland)s, Specialized Habitat for Wildlife: Amphibian Breeding Habitat (Woodlands), Seasonal Concentration Areas of Animals: Bat Maternity Colonies, Seasonal Concentration Areas of Animals: Turtle Wintering Area, Habitat for Species of Conservation Concern;
- Habitat for Species at Risk (Butternut);
- Pond supports a warm-water sport fish community; and,
- Woodlands and wetlands with high diversity of vascular plants.

The impacts to each of these areas and their functions is assessed under Section 6.

5. DESCRIPTION OF PROPOSED DEVELOPMENT

The three previous iterations of this EIS were based on a detailed development plan across the full 37 ha study area. This current (and fourth) iteration of the EIS is based on a reduced development plan focused solely on the area referred to as Block 1 within the Draft Plan. The proposed site plan for Block 1 is shown in Appendix A and detailed in the updated Functional Servicing Report (FSR) (Odan Detech, September 2022). The grading, servicing, and stormwater management plans described in the FSR were used in combination with the findings of this EIS to define an appropriate limit of development/disturbance (Figure 5). The disturbance limit was updated through consultation with Odan Detech to minimize the grading and servicing footprint and avoid tree impacts wherever possible.

The proposed plan for Block 1 includes one new industrial building ("Building 3"), and surrounding surface parking lots with trailer parking stalls and loading docks. The current site plan also includes a portion of a collector road with a 30m right of way ("Street A") that provides access to Dickenson Road West. Although not shown on the current site plan, there are future road connections planned to link this road with Upper James Street and the other (currently undeveloped) lands to the north and west of Block 1.

5.1. GRADING

The current topography of the study area consists of rolling hills varying in elevation from approximately 226 masl to 230 masl. To construct the proposed industrial buildings, roads and parking

areas, and provide the required drainage, substantial grading will be necessary (See FSR and Grading Plan). Major overland flow will be directed to the pond/Provincially Significant Wetland. Proposed elevations range from 226masl to 233masl, with retaining walls in several locations bordering the Vegetation Protection Zones of the. The disturbance limit shown on Figure 5 generally corresponds to the limit of grading, where proposed grades will match existing grades.

5.2. STORMWATER MANAGEMENT

Water Quantity and Quality

Stormwater management for the proposed development will be designed according to the City of Hamilton Airport Employment Growth District (AEGD) Subwatershed Study and Stormwater Master Plan (SWMP) (2011). Specific details for the proposed stormwater management plan are provided in the Functional Servicing Report and Stormwater Management ("FSR"; Odan/Detech Group 2022). In summary, the stormwater management plan will achieve water balance for the site and PSW, as well as water quality, quantity, and infiltration requirements per the AEGD implementation report.

Erosion Threshold Exceedance Analysis

To ensure flows from the site do not result in impacts to the receiving watercourse, an Erosion Threshold and Exceedance Analysis was completed by GeoProcess Research Associates (July 2021). The erosion threshold establishes the upper limit of flow that can be conveyed through the channel before erosion is initiated. Under existing conditions, the erosion threshold will be exceeded under higher flow events, and some erosion will occur. This is a natural process and needed to maintain channel morphology. The key when considering the proposed development and its stormwater influence on the receiving watercourse, is that the time and duration over which flows exceed the erosion threshold does not increase from the baseline condition. The GeoProcess report considered changes in flow within the watercourse post-development and found that the pre and post hydrographs for a variety of storm events (up to the 100 yr storm). In general, the pre to post hydrographs match very closely, meaning there is limited risk to increasing the potential for downstream erosion. Where small increases in erosion threshold exceedances were observed, predominantly associated with the 25 mm storm, they were of short duration (approximately 30 mins) and just above the erosion threshold. As a result, it is unlikely development of this Subject Property with the currently proposed stormwater management plan will result in the destabilization of the receiving watercourse. Please refer to the GeoProcess report (GeoProcess 2021) for the detailed analysis.

The analysis also found that the outlet channel (OC-1) from the pond was the most sensitive reach to erosion due to its relatively steeper channel slope. As a result, it was recommended that mitigation works be completed within this channel to increase its resilience to erosion. A detailed design of the mitigation works for OC-1 has not been completed at the time of writing this report, however the design will follow natural channel design principals and will likely include a series of grade control structures that will reduce the effective slope of the channel bed. Grade control structures can take the form of cross-vanes, steps, vortex weirs or riffle structures. The final determination will be based on the size of structures required, channel flow regime and fish passage considerations. Design will be developed and submitted to support the NPCA permit application.

The hydrographs used in this analysis use the conservative assumption of full site buildout, which represents a worst-case scenario as it relates to stormwater discharge (i.e. highest volume) to the natural environment. Accordingly, if the analysis finds no impacts under this conservative scenario, then it can be assumed that the construction of a single building on a small portion of the site will have an even smaller influence on the site hydrology.

5.3. SERVICING

The City of Hamilton is currently undertaking improvements to the servicing of this area and ultimately the sanitary sewer from this development will connect to a 1200mm diameter sanitary sewer trunk main extension on Dickenson Rd East and West (Odan Detech 2022). The timing of completion for this upgrade is not known and thus an interim sanitary servicing plan has been prepared. The interim plan will direct wastewater from the site to the existing sanitary pumping station at Twenty Road West in accordance with the Preferred Wastewater Servicing Strategy (2018). The capacity at this pump station is limited however upgrades are expected to be completed in 2021. Full details of the proposed servicing strategy are provided in the Functional Servicing Report (Odan Detech 2022).

6. IMPACT ASSESSMENT

6.1. IDENTIFIED CONTRAINTS

The significant ecological features/functions present on the study area, as determined through background review and field investigations, are as follows:

- Wetlands, including both Provincially Significant Wetlands and unevaluated wetlands;
- Woodlands, including Significant Woodlands and Cultural Woodlands;
- Species-at-Risk (Butternut);
- Significant Wildlife Habitat, including 7 "Candidate" types;
- Provincially and locally significant plants;
- Headwater drainage features, specifically HDF 1 which has been identified for retention;
- Warm-water fish habitat supported within the pond;
- Linkage features (hedgerows); and
- Arboricultural resources .

These constraints were identified through desktop and field assessments and are documented in Section 4 of the EIS. Impacts to these constraints with respect to the proposed activities are discussed in the following sections.

Table 13 show the policy documents related to these features and functions, related policy(s), and the implications for the proposed development.

Table 13. Summary of Policy Implications

Sensitive Natural Heritage Features	Presence within the study area (See Figure 5)	Applicable Policy Documents	Development Implications
Provincially Significant Wetland (PSW): Upper	ELC polygons 3, 5.1, 5.2, 5.3, 5.4 are within 120m of the limit of disturbance.	Provincial Policy Statement Section 2.1.5;	Minimum 30m vegetation protection zone is required and has been incorporated into Draft Plan.

Sensitive Natural Heritage Features	Presence within the study area (See Figure 5)	Applicable Policy Documents	Development Implications
Twenty Mile Creek Wetland Complex		City of Hamilton OP Section 2.5.10 (c); NPCA policies 8.2.3.4, 8.2.3.4 c	A permit will be required under Ontario Regulation 150/06 for any development within wetlands.
Unevaluated Wetlands	ELC polygon 11 is within 120m of the limit of disturbance.	City of Hamilton OP Section 2.5.10 (d)	None. No development is proposed within
Significant Woodlands	ELC polygons 7.1, and 10 are within 120m of the limit of disturbance.	Provincial Policy Statement Section 2.1.5; City of Hamilton OP Section 2.5.10 (f)	Minimum 15 m vegetation protection zone required and has been incorporated into Draft/Site Plan.
Species at Risk	Butternut trees found in ELC communities 7.1, 9.1, 14 but are not within 50m of the limit of disturbance. Potential SAR bat habitat trees throughout (Figures 3 and 5), including within limit of disturbance.	Provincial Policy Statement Section 2.1.7; Endangered Species Act (2007) Section 9; City of Hamilton OP Section 2.5.10 (i)	None - no development associated with building 3 is proposed within 50m of the butternuts. An updated IGF based on the site plan for building 3 has been submitted and is under review by MECP. Based on previous feedback from the MNRF it is recommended that they be removed outside of April 1 to October 31 to ensure that no bats are inadvertently disturbed, harmed, or killed.
Significant Wildlife Habitat	Confirmed: ELC communities 11 & are "Amphibian Breeding Habitat (Wetlands)"; ELC communities 7.1, 10 are Specialized Habitat for Wildlife: Amphibian Breeding Habitat (Woodlands) "	Provincial Policy Statement Section 2.1.5;	No alteration permitted to SWH habitats or their functions
Provincially and locally significant plants	Butternut found in ELC communities 7.1, 9.1, 10; locally significant plants throughout.	See "Species at Risk" for policy documents applicable to Butternut.	Butternuts are to be protected by a 25m setback. This setback has been incorporated into the draft plan, grading plan, and site plan. A Butternut Health Assessment Report has been submitted to MECP. No development is proposed within 50m of any butternut trees. Locally significant plants are not specifically protected under the City's OP unless within Significant Features. Some locally significant plants can be relocated within a site to protected areas. Most locally significant plants are outside the limit of development.
Headwater drainage features	HDFs were identified and assessed.	CVC and TRCA HDF Assessment Protocol	HDF 1 was identified to be retained as an open feature. HDF 3 and 4 were identified

Sensitive Natural Heritage Features	Presence within the study area (See Figure 5)	Applicable Policy Documents	Development Implications
			to have their functions maintained through the use of LID measures.
Linkage features	ELC communities as Linkage features	City of Hamilton OP Section 2.7, & Policy F.3.2.1.11, UHOP Schedule 2	Ecological integrity of linkage feature to be maintained and/or enhanced.
Arboricultural resources (trees)	Trees present throughout study area, and 1292 were tagged and assessed as part of this study.	City of Hamilton Tree Protection Guidelines; Tree of Hamilton Urban Woodland By-law; Migratory Birds Convention Act (1994)	Tree Management Plan and Tree Protection Plan required as per City's Draft Tree Protection Guidelines. Vegetation removal should not occur within the active nesting season (i.e., April 1 to August 31). If the areas proposed for development are thoroughly checked during the active breeding season for bird nests by a qualified biologist during the construction phase, and no nests are found, then construction may be permitted.
Pond (polygon 5.1)	Direct fish use confirmed	Department of Fisheries and Oceans, Fisheries Act	The pond and its habitats will be retained and protected with a 30 m setback.

6.2. IDENTIFICATION OF DIRECT, INDIRECT AND CUMULATIVE IMPACTS

Figure 5 shows the anticipated development limit for Block 1/Building 3 and the ecological constraints, including natural heritage features and the required vegetation protection zones. A detailed assessment of impacts to the natural heritage features within the study area is provided in Table 15. The activities associated with the proposed site development will result in removal of some agricultural lands and planted trees. All significant natural heritage features (Significant Woodlands, PSW) are to be preserved and protected by the required Vegetation Protection Zones; however, one stormwater swale is proposed within the 30m VPZ for the PSW. Specific areas to be impacted and are address in Table 15.. The largest impact to natural heritage features is the removal of trees within the anthropogenic and cultural vegetation communities and hedgerows, as shown on Figure 6 and address separately in the tree preservation plan report.

6.2.1. WETLANDS

The wetland features on site consist of several shallow cattail or reed-canary grass-dominated features (Polygons 3, 8, and 11) as well as a shallow aquatic community bordered by marsh and thicket swamp (Polygons 5.1 – 5.4). The plant communities in each of these wetlands are relatively low in terms of species diversity and contain species with a low or moderate sensitivity to changes in wetland

hydrology (TRCA 2017). Furthermore, TRCA ranks each of the four wetland community types as having a low- medium sensitivity to hydrologic changes. While some seepage areas in the forests were evident, there was no significant visual evidence of seepage/groundwater discharge into each of the individual wetland units, and the plant communities present did not indicate a strong presence of groundwater discharge. Rather, the abundance of species such as Red Osier Dogwood (*Cornus sericea*) and Sensitive Fern (*Onoclea sensibilis*) within polygons 5.2, 5.3, and 5.4 bordering the pond, which are relatively tolerant of fluctuating water levels (Rungus and Sims 1997), suggest that the hydrology of this wetland is primarily determined by surface flows from HDF1 with the fringe wetlands dependent on water levels within the pond rather than surface or ground water flows from the adjacent uplands.

As shown in the Functional Servicing Report and Stormwater Design Brief, both the catchment areas and flows at the outlet of each wetland/watercourse from the site will be match pre-development conditions. Furthermore, the hydroperiod of each wetland is not expected to change post development as both the flow rates and timing of peak flows during a range of storm events are very consistent with pre-development conditions. The percent change in area of each wetland catchment is less than 1%, and the proportion of each catchment converted to impermeable will be less than 1% of the overall catchment areas. Based on the TRCA's Wetland Risk Assessment (TRCA 2017) these changes represent a low magnitude of hydrologic change and low risk of impact to the hydrology of the wetland.

The most substantial change to the wetland areas post-development will be to the local catchment areas around each wetland, as the surrounding uplands will largely be graded to redirect flows into the stormwater system. This will result in a slight change from local runoff or infiltration to direct piping to the PSW. Since the hydrology of the wetland communities is function of surface water inputs from the water course (HDF1), this change is expected to be negligible.

The PSW is predominantly found along the shoreline of the pond and as such is strongly associated with the hydrologic regime of the pond. When considering the wetland water balance, assessing flows into the pond pre and post development will determine the overall water balance of the wetland. Odan Detech has modelled flows into the pond pre and post development. The results of the modelling show that post-development, flows generated from the property will closely mimic existing conditions from the two-year storm event all the way to the one-hundred-year storm event. This modelling would suggest that post-development the hydrologic regime of the pond will likely not change from its current condition, and therefore the wetland community supported by the pond will also not change. As a result, no impacts are anticipated to the water balance of the PSW under post-development conditions.

As noted above, water will be discharged from a swale to the PSW/pond and marsh (polygon 3). The swales will extend into the Vegetation Protection Zones for each feature, resulting in temporary alteration to the vegetation including meadow and thicket. These swales will be revegetated and can be done so using native species. Therefore, this impact is temporary and no cumulative effects are anticipated.

6.2.2. WOODLANDS

No woodlands will be removed as a result of the proposed development.

6.2.3. TREES

A total of 229 trees within the study area would be removed and 7 trees would be injured due to disturbance within the root zone (e.g. grading, servicing, construction) to facilitate the grading and servicing for the proposed plan. A total of 1053 would be protected. The main impact to treed features would be the removal of trees within the agricultural and cultural vegetation communities, most of which are within a planted hedgerow within the central portion of the limit of disturbance (Map 6).

A summary of tree impacts by species is shown in Table 14. In terms of number of individuals removed, the most impacted species would be American Basswood (*Tilia americana* - 72 trees), Silver Maple (*Acer saccharinum* – 21 trees), Sugar Maple (*Acer saccharum* - 24 trees), Freeman's Maple (Acer x freemanii – 18 trees), Black Walnut (Juglans nigra – 26 trees), Trembling Aspen (*Populus tremuloides - 22 trees*), and Eastern Cottonwood (Populus deltoides – 15 trees). Each of these species are common within the study area and on the landscape, and numerous trees of each species would be retained within the surveyed areas, as well as the woodlands and within the study area. For instance, Sugar Maple and American Basswood are dominant or co-dominant species within most of the woodlands. The exception would be Silver Maple for which an entire hedgerow of planted trees would be removed. A total of 2 Pringle's Hawthorn (*Crataegus coccinea var. pringlei*) would be retained. This is a significant species (uncommon) within the City of Hamilton but is common within the study area and the local landscape. Hawthorns are also commonly overlooked or misidentified due to the difficulty in identification and taxonomic complexity.

The resulting Tree Preservation Plan is shown on Map 6, including the tree data table showing which trees would be impacted and the rationale, as well as proposed tree protection fencing. A stand-alone tree data table is also provided in Appendix F.

The anticipated grading, servicing, and construction impacts to trees to be retained, but injured, may include:

- Severance of roots due to excavation;
- Root exposure to air and sunlight;
- Broken branches;
- Soil Compaction;
- Trunk damage;
- Wildlife impacts, and;
- Decreased infiltration.

Recommended mitigation and protection measures to address these impacts are presented in Section 4.3, as well as compensation requirements.

Table 14. Summary of Tree Impacts by Species

Species	Injure	Preserve	Remove	Total
Acer negundo		11	4	15
Acer platanoides		15	1	16
Acer rubrum		5		5

Acer saccharinum	3	1	21	25
Acer saccharum	1	141	24	166
Acer sp		16		16
Acer x freemanii		11	18	29
Amelanchier laevis			1	1
Carya cordiformis		7		7
Carya ovata		11		11
Crataegus coccinea var. pringlei		2		2
Crataegus punctata		24		24
Crataegus sp		37		37
Fagus grandifolia		24		24
Fraxinus americana		18		18
Fraxinus nigra		1		1
Fraxinus pennsylvanica		13		13
Fraxinus sp		7		7
Gleditsia triacanthos		4		4
Juglans cinerea		3		3
Juglans nigra	1	90	26	117
Juniperus sp		2		2
Malus pumila		5		5
Malus sp		2	1	3
Ostrya virginiana		7		7
Picea abies			3	3
Picea glauca		1	9	10
Picea pungens		1		1
Pinus sp		3		3
Pinus strobus			4	4
Populus deltoides	2		15	17
Populus tremuloides		2	22	24
Prunus avium		40	1	41
Prunus serotina		73	2	75
Prunus virginiana		2		2
Pyrus communis		1		1
Quercus macrocarpa		22		22
Quercus rubra		12	1	13
Robinia pseudoacacia		1		1
Salix alba		1		1
Salix caprea		3		3
Salix nigra		1		1
Salix sp		5		5

Salix x fragilis		1		1
Thuja occidentalis			1	1
Tilia americana		405	72	477
Tsuga canadensis		1		1
Ulmus americana		10	1	11
Ulmus glabra		3	1	4
Ulmus sp		1		1
Dead Trees		7	1	8
Total	**7**	**1053**	**229**	**1289**

*Could not be accurately identified due to extent of decay.

6.2.4. FISH HABITAT

The proposed development will not impact the existing warm-water fish habitat found on the site. The pond will be retained as is with a 30 m setback. As discussed in Section 6.2.1 above, the hydrologic regime of the pond is not anticipated to be altered post-development. In addition, an enhanced level of water quality control is proposed for all stormwater entering the pond, which should reduce the risk of water quality degradation within the pond

6.2.5. HEADWATER DRAINAGE FEATURES

Only HDF 4 is found within the development footprint. HDF 4 conveys flow to the downstream wetland complex (polygon 3). Reaches located within the wetland will be maintained and upstream reaches will be overprinted; however, the surface flow that they contribute to the wetland will be maintained. See the Odan-Detech Functional Servicing Report for details (Odan-Detech 2021). The management recommendation coming from the HDF assessment included replicating its functionreplicated within the stormwater management facilities and through the implementation of Low Impact Development (LID) measures such as soak away pits. These measures will ensure that the both the surface hydrologic and shallow groundwater recharge functions of the HDFs will be maintained on-site.

All the remaining HDFs will be maintained in their current condition and will not be impacted by the construction of the proposed building and road.

6.3. LINKAGES

Only polygon 9.1 has been identified as a linkage feature and is beyond 120m from the disturbance limit. Therefore, no direct, indirect, or cumulative effects are anticipated.

Table 15. Impact Assessment Matrix

<table>
<tr><th>Activity*</th><th>Impact (without Mitigation)</th><th>Magnitude / Extent (without mitigation)</th><th>Significance / Regulations</th><th>Proposed Mitigation/Compensation (See Section 7 for details)</th></tr>
<tr><td>Vegetation Removal</td><td>Removal/alteration of existing vegetation communities</td><td>
<table>
<tr><th>Polygon #</th><th>ELC Code</th><th>Community Description</th><th>NH Designation</th><th>Total Area (ha)</th><th>Area (ha) and Percentage of Total Area to be Removed and Description</th></tr>
<tr><td>1.1 and 1.2</td><td>AGR</td><td>Agricultural</td><td>VPZ (Significant Woodland and non-evaluated wetland)</td><td>21.19</td><td>3.6ha (16.99%)</td></tr>
<tr><td>2</td><td>HR</td><td>Hedgerow</td><td></td><td>0.35</td><td>0.32 (92.6%)</td></tr>
<tr><td>3</td><td>MAM2-2</td><td>Reed-canary Grass Mineral Meadow Marsh</td><td>Core Area (PSW)</td><td>0.28</td><td>0 (0%)</td></tr>
<tr><td>4</td><td>CUS1</td><td>Mineral Cultural Savannah</td><td>VPZ (PSW)</td><td>1.02</td><td>0.12 (12.16%)
Partial removal for grading, VPZ portion to be retained</td></tr>
<tr><td>5.1</td><td>SAF1-3</td><td>Duckweed Floating-leaved Shallow Aquatic</td><td>Core Area (PSW)</td><td>0.96</td><td>0 (0%)</td></tr>
<tr><td>5.2</td><td>MAM2-2</td><td>Reed-canary Grass Mineral Meadow Marsh</td><td>Core Area (PSW)</td><td>0.05</td><td>0 (0%)</td></tr>
<tr><td>5.3</td><td>SWT2-5</td><td>Red-Osier Mineral Thicket Swamp</td><td>Core Area (PSW)</td><td>0.72</td><td>0 (0%)</td></tr>
<tr><td>5.4</td><td>MAS2-1</td><td>Cattail Mineral Shallow Marsh</td><td>Core Area (PSW)</td><td>0.11</td><td>0 (0%)</td></tr>
<tr><td>6.1</td><td>CUW</td><td>Cultural Woodland</td><td>Core Area (woodland)</td><td>0.29</td><td>0 001(0.27%)
Small area to be converted to SWM swale.</td></tr>
<tr><td>6.2</td><td>CUW</td><td>Cultural Woodland</td><td>Core Area (woodland)</td><td>0.13</td><td>0 (0%)</td></tr>
<tr><td>6.3</td><td>CUW</td><td>Cultural Woodland</td><td>Core Area (woodland)</td><td>0.14</td><td>0 (0%)</td></tr>
<tr><td>6.4</td><td>CUW</td><td>Cultural Woodland</td><td>Core Area (woodland)</td><td>0.13</td><td>0 (0%)</td></tr>
<tr><td>7.1</td><td>FOD5-2</td><td>Dry – Fresh Sugar Maple – Beech Deciduous Forest</td><td>Core Area (significant woodland)</td><td>2.56</td><td>0 (0%)</td></tr>
<tr><td>7.2</td><td>FOD5-2</td><td>Dry – Fresh Sugar Maple – Beech Deciduous Forest</td><td>Core Area (significant woodland)</td><td>0.54</td><td>0 (0%)</td></tr>
<tr><td>8</td><td>MAM2-2</td><td>Reed-canary Grass Mineral Meadow Marsh</td><td>PSW</td><td>0.26</td><td>0 (0%)</td></tr>
<tr><td>9.1</td><td>HR</td><td>Hedgerow</td><td>Linkage</td><td>1.6</td><td>0 (0%)</td></tr>
<tr><td>9.2</td><td>HR</td><td>Hedgerow</td><td>Linkage</td><td>0.14</td><td>0 (0%)</td></tr>
<tr><td>10</td><td>FOD5-2</td><td>Dry – Fresh Sugar Maple – Beech Deciduous Forest</td><td>Core Area (significant woodland)</td><td>1.39</td><td>0 (0%)</td></tr>
<tr><td>11</td><td>MAS2-1</td><td>Cattail Mineral Shallow Marsh</td><td>Core Area (Non-evaluated Wetland)</td><td>0.11</td><td>0 (0%)</td></tr>
<tr><td>12</td><td>ANTH</td><td>Anthropogenic</td><td></td><td>0.93</td><td>0 (0%)</td></tr>
<tr><td>13</td><td>MAM2-2</td><td>Reed-canary Grass Mineral Meadow Marsh</td><td>Core Area (PSW)</td><td>3.82</td><td>0 (0%)</td></tr>
<tr><td>14</td><td>FOD</td><td>Deciduous Forest</td><td>Core Area (significant woodland)</td><td>1.48</td><td>0 (0%)</td></tr>
<tr><td>15.1</td><td>HR</td><td>Hedgerow</td><td>Core Area (hedgerow)</td><td>0.07</td><td>0 (0%)</td></tr>
<tr><td>15.2</td><td>HR</td><td>Hedgerow</td><td>Core Area (hedgerow)</td><td>0.07</td><td>0 (0%)</td></tr>
<tr><td>16.1</td><td>CUT1</td><td>Mineral Cultural Thicket</td><td>VPZ (PSW and woodland)</td><td>3.96</td><td>3.9 (98.38%)
Permanent removal for grading and construction, VPZ portion to be retained</td></tr>
<tr><td>16.2</td><td>CUT1</td><td>Mineral Cultural Thicket</td><td>VPZ (PSW)</td><td>1.63</td><td>1.15 (70.47%)</td></tr>
</table>
</td><td>

Two SWM swales are proposed within the VPZs for the PSW (Polygons 5.3 and 3). Swale will extend through meadow, laneway, and Sumac-dominant portion of woodland polygon 6.1 within VPZ for polygon 5.3 and through meadow/exotic thicket vegetation for polygon 3. No significant vegetation will be altered.
Small portion of VPZ to polygon 11 will require grading but will be revegetated. Short term and non-cumulative impact.

</td><td>

Impacts to the PSW due to SWM swales can be mitigated through erosion and sediment control and revegetation with native species. Impacts are temporary and non-cumulative.

</td></tr>
</table>

Activity*	Impact (without Mitigation)	Magnitude / Extent (without mitigation)	Significance / Regulations	Proposed Mitigation/Compensation (See Section 7 for details)
		<table><tr><td></td><td></td><td></td><td></td><td></td><td>Alteration SWM swales. Most areas will be revegetated.</td></tr><tr><td>17</td><td>CUM1</td><td>Mineral Cultural Meadow</td><td>VPZ (PSW/woodland)</td><td>1.62</td><td>0 (0%)</td></tr><tr><td>18</td><td>ANTH</td><td>Anthropogenic</td><td></td><td>0.27</td><td>0 (0%)</td></tr><tr><td>19</td><td>MAM2-2</td><td>Reed-canary Grass Mineral Meadow Marsh</td><td>Core Area (PSW)</td><td>0.09</td><td>0 (0%)</td></tr><tr><td>22</td><td>MAM2-2</td><td>Reed-canary Grass Mineral Meadow Marsh</td><td>Core Area (PSW</td><td>0.26</td><td>0 (0%)</td></tr></table> • No locally or provincially significant species are within the limit of disturbance, so will not be impacted.		
	Impacts to existing trees	• Impacts to trees are shown on Map 6 and in Table • Removal of 229 trees and potential injury to 7 trees, primarily American Basswood, Sugar Maple, and Black Walnut • No locally or provincially significant species are within the limit of disturbance, so will not be directly impacted. No indirect impacts anticipated.	• No significant tree species identified that would be removed • Removal of trees associated canopy cover from planted hedgerow (polygon 2). Noremoval or injry to trees within woodlands or wetland. • Tree removals/injries require 1:1 compensation under City policies	• See Tree Preservation and Protection measures and Tree Compensation Measures (Section 7.1.2.1) • Tree compensation planting can be provided within woodland and wetland VPZs, compensating for the loss of overall tree cover from hedgerows and providing a net increase in tree and canopy cover across the site.
	Construction disturbance of wildlife or wildlife habitat, including potential SAR, candidate SWH, confirmed SWH	• Removal of agricultural lands will have minimal impacts to wildlife population; these areas have been in agricultural operation historically and are currently. • Potential mortality of migratory birds nesting within construction areas (e.g. Killdeer)	• Potential loss of SAR bat maternity roost habitat (snag trees)	• Avoid site clearing activities during the breeding bird nesting period (April 15 – July 31); or, monitor site weekly for breeding bird activity and cease construction if any nests are encountered (See Section 7.1.3.2) • No trees identified as suitable maternity roost habitat should be removed between May 1 and September 30 in case migratory bats (Endangered or otherwise) are using them. (See Section 7.1.2.4) • Erosion and Sediment Control Plan including Wildlife Exclusion Fencing (See Section 7.1.2.6) • Revegetation of SWM swales compliment wetland communities within PSW (See Section 7.1.2.2)
	Decreased soil stability	• Eroded soils from exposed areas may enter watercourse (HDF 1 and 2) and wetlands (polygon 3 and 5.1-5.4).	• NPCA Wetland and Watercourse, City of Hamilton NHS	• Erosion and Sediment Control Plan including Wildlife Exclusion Fencing (See Section 7.1.2.6)

Activity*	Impact (without Mitigation)	Magnitude / Extent (without mitigation)	Significance / Regulations	Proposed Mitigation/Compensation (See Section 7 for details)
Grading	Import/ Export of Fill	• Eroded fill and native soils from graded areas may enter watercourse (HDF 1 and 2) and wetland (3 and 5.1-5.4); • Grading design will aim to achieve a cut/fill balance.	• NPCA Wetland and Watercourse, City of Hamilton NHS	• Erosion and Sediment Control Plan including Wildlife Exclusion Fencing (See Section 7.1.2.6) • Stabilization of exposed soils post-construction to prevent soil erosion. • HDF Mitigation Recommendations (See Section 7.1.1.4)
	Construction disturbance of wildlife, including potential SAR	• Potential mortality of migratory birds nesting within construction areas (e.g. Killdeer).		• Avoid grading activities during the nesting period (May 1 – July 31; See Section 7.1.3.2) • Install and maintain wildlife exclusion fencing to prevent smaller wildlife from entering site during construction (See Section 7.1.2.6) • Education of contractors on wildlife encounters (See Section 7.1.2.9)
	Decreased soil stability	• Eroded soils from graded areas may enter wetlands and woodlands. Increased sedimentation into these areas may affect locally rare plants.	• NPCA Wetland and Watercourse, City of Hamilton NHS	• Installation and maintenance of silt fencing during construction to prevent overland flow of sediments from fill material into watercourse or wetland (See Section 7.1.2.6) • HDF Mitigation Recommendations (See Section 7.1.1.4)
	Potential alteration of drainage patterns	• Changes to existing drainage patterns may cause alteration of the natural infiltration rates. Increased susceptibility to erosion may result in increased sediment runoff, thereby affecting the quantity and quality of runoff contributions to the wetlands and watercourse. Localized alteration of drainage patterns will occur due to grading. • HDF 2 will be partially replaced by stormwater infrastructure.	• NPCA Wetland and Watercourse, City of Hamilton NHS	• Installation and maintenance of silt fencing during construction to prevent overland flow of sediments from fill material into watercourse or wetland (See Section 7.1.2.6) • LID infiltration beds to be incorporated into SWM design • HDF Mitigation Recommendations (See Section 7.1.1.4) •)
Roads & Servicing	Decreased soil stability	• See comments under Grading	• NPCA Wetland and Watercourse, City of Hamilton NHS	• Installation and maintenance of silt fencing during construction to prevent overland flow of sediments from fill material into watercourse or wetland (See Section 7.1.2.6) • HDF Mitigation Recommendations (See Section 7.1.1.4) • Education of contractors on wildlife encounters (See Section 7.1.2.9)
Construction	Decrease in permeability	• Most of the development area will be converted to impervious surfaces; however, stormwater management infrastructure (e.g. stormwater management facilities, LID soak away pits) will be used to balance infiltration at the site-level.	• AEGD Subwatershed Study and SWMP Implementation Document requirements for water quality and quantity	• SWM quantity and quality controls (See Odan Detech 2022) • LID infiltration beds to be incorporated into SWM design • Education of contractors on wildlife encounters (See Section 7.1.2.9)
Building Construction & Occupancy	Water Quality & Quantity	• Altered quality of water entering watercourses and wetlands. Levels of phosphates, nitrates, and other chemicals related to agricultural activities is expected to be reduced post-development. Levels of salt, heavy metals, oil, and fuel residues are expected to increase and runoff, causing harm to terrestrial, wetland and aquatic organisms. Road salt can damage roadside vegetation, affect terrestrial, wetland, an aquatic biota, and can persist and accumulate in soils and groundwater, affecting soil and groundwater chemistry (Tiwari and Rachlin 2018). • Longer flows may cause potential impacts to downstream watercourses • Most of the development area will be converted to impervious surfaces; however, stormwater management infrastructure (e.g. stormwater management facilities, LID soak away pits) will be used to balance infiltration at the site-level.	• NPCA Wetland and Watercourse, City of Hamilton NHS • AEGD Subwatershed Study and SWMP Implementation Document requirements for water quality and quantity	• SWM quantity and quality controls (See Odan Detech 2022). • HDF Mitigation Recommendations (See Section 7.1.1.4) • Develop Salt Management Plan for site (See Section 7.1.2.9) • Post-construction wetland monitoring (See Section 7.1.4.3)
	Lighting	• Light pollution from street lights and building lights within natural areas	• Sensitive species may be affected	• Bird-friendly lighting design (See Section 7.1.2.3)

Activity*	Impact (without Mitigation)	Magnitude / Extent (without mitigation)	Significance / Regulations	Proposed Mitigation/Compensation (See Section 7 for details)
	Landscape Plantings	• Landscaping may introduce invasive exotic species to wetlands, watercourse, and adjacent Natural Heritage System.	• NPCA Wetland and Watercourse, City of Hamilton NHS	• Restoration plantings in Vegetation Protection Zones (See Section 7.1.2.2 and Section 7.1.4.2) • Require native species in landscaping plans • Education and stewardship measures for businesses to encourage planting of native species
	Site Use/Vehicle Traffic	• Increased wildlife mortality at road crossings (i.e. road kill)	• Reptiles, Amphibians, Small mammals, and Birds	• Fencing Plan design to guide wildlife movement through Core Areas and Linkages (e.g. open channel) (See Section 7.1.2.7) • Wildlife Crossing Sign

7. MITIGATION MEASURES

In this section, strategies are presented to avoid or mitigate impacts to ensure no negative impacts or enhancement of natural heritage features and functions. Mitigation includes actions taken during the planning, design, construction, and occupancy to avoid, reduce or compensate for potential adverse effects on features and functions. This may include restoration works to replace or enhance the quantity and/or quality of the existing features and functions.

The main principles behind mitigation/restoration are to:

1. Limit the extent of impacts through site specific mitigation responses;
2. Plan for the recovery from remaining impacts with effective restoration; and,
3. Identify opportunities for enhancements to improve ecosystem function and overall biodiversity.

7.1. PROPOSED MITIGATION & RESTORATION MEASURES

The proposed mitigation measures to be implemented for this property are summarized in Table 12 and described in detail in the subsections below.

Table 10. Mitigation and Restoration Measures

Mitigation Measure	Purpose	Implementation Schedule
Buffers from wetlands	Define appropriate development setback from wetlands on site	***Complete*** **–** limits of wetlands delineated, 30m buffer from PSWs, 15m buffer from other wetlands provided on plans
Buffers from woodlands	Define appropriate development setback from woodlands on site	***Complete*** **–** limits of woodlands delineated, 15m buffer from significant woodlands, 10m buffer from other woodlands provided on plans
Headwater drainage features	Mitigate impacts of development on headwater drainage features	***Completed*** *stormwater management design includes use of LIDs*
Setbacks from Butternut	Define appropriate development setback from Endangered Butternut found on site	***Complete*** – 25m setbacks from Butternut trees have been incorporated into the plans. Confirmation of BHA by MECP (See Appendix G). Updated IGF to be provided to MNRF based on current SIte Plan.
Tree management	Identify trees to be preserved and compensation requirements	***Complete-*** **–** Tree Management Plan has been prepared (Sections 7.1.2.1. and Map 6).
Ecological enhancement and restoration	Enhance ecological integrity of woodlands and wetlands on site through planting in buffer areas, invasive species management, and plant salvage	***Detailed design & Site Plan Approval stage*** **–** Conceptual design recommendations provided in Section 7.1.2.2. Restoration and Enhancement Implementation Plan to be prepared following

Mitigation Measure	Purpose	Implementation Schedule
		recommendations prepared as part of EIS when development plans are finalized
Bat habitat mitigation	Mitigate impacts of development on bat habitat availability on the study site	***Detailed design & Site Plan Approval stage –*** IGF updated based on current Site Plan and submitted to MECP. Pending feedback from MECP
Maintain water balance and water quality	Avoid ecological change to adjacent wetlands and HDFs by maintaining water quality, quantity, flow rates, and infiltration.	***Complete*** – water balance assessment completed as part of Functional Servicing and Stormwater Design ***Detailed design & Site Plan Approval stage –*** Salt Management Plan
Reptile Habitat Mitigation	Avoid impacts on candidate Significant Wildlife Habitat (Reptile hibernaculum, Turtle Wintering Areas and Turtle Nesting Areas).	***Construction stage –*** Impacts on natural areas should be avoided during hibernation period (September-May). Wildlife sweeps should take place prior to any vegetation removal (March-October). Be aware of reptiles crossing roads March-October). Attention should be paid for nesting turtles (May-June).
Sediment and erosion control	Protect wetlands and woodlands from sedimentation & erosion	***Detailed design & Site Plan Approval stage -*** Erosion & sediment control plan to be prepared by Odan-Detech
Prevent encroachment into wetlands and woodlands	Prevent encroachment into woodlands which may occur i.e. yard waste dumping, littering, trail development	***Detailed design & Site Plan Approval stage –*** Fencing (living fence, buffer plantings, and/or solid fences) plan to be prepared. High-level recommendations provided in Section 7.1.2.7
Timing construction to avoid impacts to migratory birds	Comply with the Migratory Birds Convention Act (MBCA, 1994)	***Construction stage -*** Vegetation removal should not occur within the active nesting season *(April 15th to August 15th)*
Monitor plantings for 2 years following construction	Ensure that plants are establishing according to intent of conceptual and detailed design.	***Post-construction stage -*** to be implemented as part of detailed design contract administration

Following are detailed explanations of these recommended measures, organized by implementation schedule.

7.1.1. PRELIMINARY APPLICATION / EIS MEASURES

7.1.1.1. VEGETATION PROTECTION ZONES FOR WETLANDS

A 30m Vegetation Protection Zone (buffer) for Provincially Significant Wetlands (PSWs) and 15m Vegetation Protection Zone for non-PSW wetlands is required per UHOP Policies under Section C.2.5. These VPZs have been incorporated into the Draft Plan of Subdivision as separate blocks (see Figure 5 and Appendix A). There are three locations within VPZs where minor development is proposed; the construction of swales to convey stormwater to the PSW. This impact will be short term, and recommendations for vegetating the swales is provided under Section 7.1.2.2.

These Vegetation Protection Zone widths are sufficient for protection of the wetlands given 1) their relatively low sensitivity to hydrologic alterations 2) the maintenance of the water balance for each wetland post-development, and 3) development is setback additional distances from the VPZs in most areas, and 4) the various design and mitigation measures in recommended to protect and enhance water quality post-development (See FSR and recommendation below). Restoration of these areas to enhance ecologic function and buffering will be considered in the Restoration and Enhancement Implementation Plan to be prepared at the detailed design stage. General recommendations for revegetating Vegetation Protection Zones is provided in Section 7.1.1.2

7.1.1.2. VEGETATION PROTECTION ZONES FOR WOODLANDS

A 15m Vegetation Protection Zone for Significant Woodlands, and 10m Vegetation Protection Zones for all other woodlands are required under UHOP and AEGD policies. No development is proposed in close proximity to Significant Woodlands or VPZs. These widths are sufficient to protect these features from the proposed development during all phases of the project from construction to occupancy, provided all additional mitigation measures are implemented (e.g. fencing plan). Restoration of the VPZs to enhance ecologic function and buffering will be considered in the Restoration and Enhancement Implementation Plan to be prepared at the detailed design stage. General recommendations for revegetating Vegetation Protection Zones is provided in Section 7.1.2.2.

7.1.1.3. SETBACKS FROM BUTTERNUT

A 25m setback is required from the Butternut trees found on and adjacent to the site. This setback has been included in the site plan and all associated plans (see Figure 5). No development s proposed within 50m of butternuts. The MECP was provided with the Butternut Health Assessment on October 24, 2018th and confirmed receipt on March 2nd, 2020. No concern, recommendations, or permitting requirements were provided (See Appendix G).

7.1.1.4. HEADWATER DRAINAGE FEATURES

The 2014 HDF Guidelines provides management recommendations related to HDF, which are to be considered in conjunction with other assessment tools. As stated in the guidelines: "The outcome of applying this guideline should be integrated with the results of other studies ... and relevant information should be used to tie back to aquatic functions, and vice versa". In addition, the 2014 HDF Guidelines recognize that: "[o]ther Conservation Authority policies or other legislation with respect to wetlands, watercourses and/or species at risk need to be assessed in the context of [the management options] key" (ref. p. 20).

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The HDF assessment for the Subject Property identified a management recommendation of:

- Mitigation for HDF 1 and HDF 4;
- Conservation for HDF 2;
- No Management Required for HDF 2a, HDF 3, and HDF 5.

The 2014 HDF Guidelines provides the following direction for each of the management recommendations:

Mitigation – Contributing Functions:

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

The guidelines also recommend that the HDF:

- Remain open;
- If relocated, natural channel design is not required;
- Hydroperiod is to be maintained;
- Direct connection to downstream is maintained;
- Replication of the feature functions can be accommodated through using bioswales, LID, vegetated swales or constructed wetlands

Conservation – Valued Functions:

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

- Use natural channel design techniques to maintain or enhance overall productivity of the reach;
- Drainage feature must connect to downstream

The guidelines also recommend that the HDF:

- The channel must remain open;
- Relocation maybe considered, not preferred;
- Maintain or replicate groundwater or wetlands, restore if possible;
- Hydroperiod is to be maintained;
- Maintain direct connection to downstream.

No Management Required – Limited Functions:

- The feature that was identified during desktop pre-screening has been field verified to confirm that no feature and/or functions associated with headwater drainage features are present on the ground and/or there is no connection downstream. These features are generally characterized by lack of flow, evidence of cultivation, furrowing, presence of a seasonal crop, and lack of natural vegetation. No management recommendations required.

Overall, based on the HDF assessment completed for the subject property the following is recommended for the treatment of the Subject Property HDFs:

- HDF 1 – maintain as an open feature, but realignment is an option;
- HDF 2 – maintain within the woodlot in its current form;
- HDF 2a – feature can be removed. Maintain flow to the downstream HDF 2 reach within the woodlot
- HDF 3 – feature can be removed, no mitigation measures required.
- HDF 4 – feature can be removed but its functions are to be replicated through LID measures such as infiltration galleries.
- HDF 5 – feature can be removed, no mitigation measures required.

Only HDF 4 is within the disturbance limit of the site plan for Building 3 and would be impacted, requiring mitigation.

7.1.2. DETAILED DESIGN & SITE PLAN APPROVAL MEASURES

7.1.2.1. TREE MANAGEMENT PLAN AND COMPENSATION

All trees ≥10 cm DBH on the study site within areas that have the potential to be impacted have been tagged and assessed by D&A arborists. A total of7 trees will be retained with potential for injury due to construction activities. These trees will require protective measures during each stage of the development.

The following tree protection measures are recommended :

1. The following recommendations apply to tree removal is it relates to compliance with the Migratory Birds Convention Act (1994):
    - To be in compliance with the Migratory Bird Convention Act (MBCA 1994), any vegetation removal on the site should be done outside of the breeding bird window, which for this site

would be approximately April 15 to August 15. If any vegetation removal is to occur within this window, a qualified avian ecologist should first check the vegetation to be removed to ensure that there are no migratory birds covered by the Act nesting within it. If any birds are found nesting then, in consultation with Environment Canada, a suitable buffer should be established around the nest, and no activities will be permitted with this buffer until the birds have left.

- If construction occurs in the spring or summer (April 15th – August 15th), nest sweeps of the site should be conducted prior to construction to ensure that unusually early or late nesting is not taking place, or that dependent young, even though fully fledged, are not in the area and unable to disperse. If breeding birds are found, construction must be delayed until all young have fledged.

2. As per MECP guidance regarding Species at Risk Bats (Appendix J), tree removals should take place outside the active window for bats (April 1st – September 30th) to avoid direct impacts to SAR bats. If tree removals cannot take place outside the active window for bats, the MECP should be contacted immediately to determine next steps. Overall Benefit Permit may be required.
3. Before beginning construction, Tree Protection Zones (TPZ) should be established, and Tree Protection Fencing (TPF) installed around each of the trees to be preserved with appropriate signage. TPZ distances for each of the trees to be preserved shall be a minimum of 1m beyond the tree's dripline, as per the City's Tree Protection Guidelines (City of Hamilton 2010). Specific requirements for installation of the TPF is provided on the drawing shown on Figure 1 within the Tree Protection Guidelines. Tree Protection Zones may be modified temporarily to allow access for construction, such as equipment access routes, provided appropriate measures are provided to protect trees. The recommended locations for Tree Protection Fencing is shown on the Tree Preservation Plan (Figure 6).
4. All Tree Protection Fences should be inspected by a Certified Arborist before construction activity begins.
5. All of the retained trees that are subject to grading or filling within their dripline (i.e. injured), should be thoroughly watered before and periodically during construction to minimize stress.
6. Where grading is to occur within Tree Protection Zones, trees should only be retained if the specific mitigation recommendations in Table 17 are followed. Otherwise, these trees may present a significant hazard due to root loss and compromised structural integrity.
7. Following construction and implementation of the mitigation recommendations, the biological and structural condition of all the trees to be preserved should be monitored by an ISA Certified Arborist for a minimum of one year, in particular for Ash (*Fraxinus* spp) trees. These are indicated in Appendix F. If a decline in condition is detected, recommendations for removal or maintenance of the tree should be provided.
8. All construction work around trees, including tree removal and pruning, should occur after the active growing season (i.e. after October 31st), if possible.
9. Some small trees (i.e. <15 cm dbh) that are in good biological condition, including those that were not inventoried during this study (i.e. <10 cm dbh), could be transplanted. Native trees can be planted in landscaped areas as well as the restoration and enhancement areas discussed in Section 7.1.2.2, provided the site conditions are appropriate (soil texture, moisture, light availability).

The City requires 1 for 1 compensation for any trees removed or injured?. Based on the current plan, 236 would need to be replanted. Where it is not possible to replant trees due to lack of space, Cash-in-lieu

will be provided to the City for replanting elsewhere (City of Hamilton, 2010). Recommended space for compensation plantings has been provided on Map 6. Vegetation Protection Zones will also require revegetation in some areas, and would be suitable for compensation plantings. A landscaping plan is also required at the detailed design stage, and should take into account compensation requirements.

Table 16. Construction activities, impacts to trees, and recommended mitigation measures to prevent or minimize damage to trees proposed to be injured (based on Matheny and Clarke 1998).

Construction Activity	Impacts to Tree	Recommended Mitigation/Treatments to Prevent Damage
Clearing and grubbing (around trees to be retained)	Root damage or loss, compromised structural integrity and long-term health	• Install Tree Protection Fencing around Tree Protection Zone (TPZ) • Prohibit stripping existing topsoil within TPZ around trees to be retained; • Woody vegetation to be removed adjacent to preserved trees should be cut at ground level and not pulled out by equipment. Arborist may be needed for adjacent tree removal if crowns are intertwined; • If roots of trees to be retained are cut or torn during the clearing and grubbing, they shall be pruned by an ISA Certified Arborist.
Construction of retaining wall (fill and structure)	Soil compaction and altered soil moisture and oxygen conditions, root damage or loss, compromised structural integrity and long-term health	• Filling and placement of the retaining wall should be avoided within the Tree Protection Zone of trees to be preserved. Minor adjustments to grading and the placement of the retaining wall should be made to minimize encroachment into the Tree Protection Zone (dripline +1m). • Construction of the retaining wall should be completed from within the graded area; construction activity outside the retaining wall should be avoided where possible.
Creating clearance for building, traffic, and movement of construction equipment	Damage to crown	• Install Tree Protection Fencing around the TPZ; • Divert construction traffic away from trees; • Prior to construction, prune branches of trees to a minimum height required

		for construction. All pruning shall be completed by a Certified Arborist;
Soil compaction/Filling (around trees to be retained)	Unfavourable conditions for root growth; chronic stress from reduced root systems	• Install Tree Protection Fencing to keep traffic and storage out of root zone (i.e. dripline). Where access within the TPZ is required, adjust the TPZ and protect soils with at least 15cm of mulch; • Divert construction traffic and storage areas away from trees; • Minimize soil compaction within the Tree Protection Zone;
Spills, Waste disposal (e.g. paint, oil, fuel)	Unfavourable conditions for root growth; chronic stress from reduced root systems	• Install Tree Protection Fencing to exclude dumping; • Clean up accidental spills immediately;
Increased exposure due to removal of adjacent trees and pruning.	Increased exposure	• Retain or replace understory vegetation with suitable native species or mulch; • Avoid severe pruning where previously shaded bark would be exposed to sun.

7.1.2.2. ECOLOGICAL RESTORATION AND ENHANCEMENT

Significant enhancement and restoration are recommended within the VPZs, including habitat creation on existing agricultural fields, invasive species removal, transplanting significant and other native species, and enhancement of cultural areas with native plantings. Several areas have also been identified that would be ideal for woodland creation (Map 6).

In this report, the terms enhancement and restoration are defined as followed:

- Enhancement - the augmentation or alteration of existing vegetation communities (e.g. woodland) to increase the biological diversity of native species, reduce the presence of exotic invasive species, and increase the value of habitat for wildlife.
- Restoration - the creation of new vegetation communities within areas that are currently disturbed or open (i.e., meadow) to increase native vegetation cover and connectivity between existing habitats and improve the quality of habitat for migratory birds and other wildlife.

It is recommended that a detailed Restoration and Enhancement Implementation Plan be developed for the study area based on the recommendations provided in this report. This plan should clearly define goals, specific targets, and methods used for the restoration and enhancement activities. Species specified within all of the proposed restoration and enhancement areas should be based on the Appendix 4 in the City's Tree Protection Guidelines (List of native tree species recommended for planting).

Woodland Restoration

A total of 736m^2 of significant woodland would be removed to widen Dickenson Road East and allow for grading the future road connection. Opportunities to restore woodlands and provide compensation

for the areas lost have been identified on Figure 6, which total 2450.21m^2. One of these areas is contiguous with polygon 10 and is 193.59m^2 in size. A 1850.24m^2 area has been identified within polygon 17, currently a cultural meadow, between polygons 6.1 and 3. Restoring woodland in this area would augment the adjacent Vegetation Protection Zones and provide continuous canopy cover with existing woodland (polygons 6.1) and significant woodland (polygons 14, and 7.1). Two additional areas within polygon 9.1 have been identified which are currently gaps along another wise contiguous hedgerow. Planting trees in these areas would not create woodland by definition, but would enhance the existing linkage functions of this feature and partially compensate for trees lost along the length of this feature. The Restoration and Enhancement Plan should specify restoration treatments for these areas.

Vegetation Protection Zones

The majority of Vegetation Protection Zone (VPZ) areas are on lands which are currently agricultural fields, while others contain successional vegetation communities. The agricultural fields were cash-cropped for many years, and lay fallow in 2019.

Restoration works within Vegetation Protection Zones should focus on:

- Stabilizing soils with a diverse herbaceous seed mix; and
- Promoting ecological succession to habitat complimentary to adjacent habitats through nodal plantings of trees and shrubs.

A recommended planting approach for woody species is provided in Appendix M, and recommended seed mixes are provided in Appendix M. Recommended tree size for restoration and enhancement is 100 – 150 cm whips, and recommended shrubs size is 2 year seedlings or 30-50 cm container grown. D&A recommends a nodal planting approach, which allows new plantings to better resist competition from existing herbaceous plants. If bare soil is present a native seed mix can be hand broadcast to stabilize soils.

The target communities for restoration within the VPZs should be modelled after the existing adjacent vegetation community. For instance the VPZ along the south edge of polygon 7.1 should focus on extending the woodland edge into the VPZ and succession to a Dry-Fresh Sugar Maple – Beech Deciduous Forest in the long term. Successional woody species, such as Staghorn Sumac (*Rhus typhina*), Gray Dogwood (*Cornus racemosa*), and Hawthorns (*Crataegus punctata* and *Crataegus coccinea var. pringlei*) area currently abundant in many areas, and will naturally establish within the VPZs over time. Therefore, the restoration plans for these areas should aim to promote the establishment of these species while also diversifying the vegetation cover.

The north edge of polygon was recently exposed due to removal of a portion of forest. The restoration plan for the VPZ along this edge should focus on using rapidly growing species so that a woodland edge will quickly re-establish and help protect the forest interior from edge effects (e.g. increased light and temperature).

The VPZs adjacent to polygons 6.1, 6.2, and 6.3 are currently cultural meadow and should remain so to retain meadow habitat within the study area, which would be reduced post-development. Woody vegetation is already establishing in some of these areas, so the focus of the restoration plan should be removing or preventing the establishment of invasive woody species, and augmenting the meadow community by increasing the biodiversity of native forbs and grasses.

The VPZ adjacent to polygon 4 is currently a moist meadow. The buffering function of this VPZ would be enhanced through the removal of the planted exotic willows and establishment of native woody vegetation.

The VPZs along the north side of polygons 5.3 and 6.4 are current agricultural field. These areas are low-lying and would support a moist meadow vegetation community, or the creation of wetland pockets, such as vernal pool, that would support the functions of the existing wetlands.
An additional recommendation for the restoration and enhancement of the Vegetation Protection Zones is to fill in the gaps between polygons 6.1, 6.2, and 6.3 with native woody vegetation to creation contiguous tree cover along the south side of the PSW and therefor improve the linkage functions of this feature.

Invasive Species Removal

The woodland and wetland areas within the study site, as well as portions of the VPZs, have populations of invasive exotic species that should be considered high priority for removal. The removal of these invasive exotic species is recommended to improve the quality of the flora that comprise these features and to reduce the threat of habitat loss posed by invasive species. It will also help prevent their spread to neighbouring natural areas and will provide opportunity for reestablishing native vegetation cover within the restoration and enhancement areas.

Priority invasive species for removal within the study area include:

- Common Buckthorn (*Rhamnus cathartica*) – polygons 6.1, 6.2, 6.3, and 9.1
- Exotic Willows – polygon 17
- Reed Canary Grass (*Phalaris arundinacea*) – polygons 3, 5.2, 5.3, and 11

Specific methods for removing these species should follow the Best Management Practices provided by the Ontario Invasive Plant Council. Methods for removing invasive species vary and may involve cutting or treatment with herbicides where permitted. Care should be taken when removing invasive species to have as little impact as possible on the native vegetation and wildlife within the woodlands and wetlands.

Transplanting Native Species

Hedgerows orportions of hedgerows that would not be retained (polygons 4, 9.1, and 9.2) contain native species of suitable type and size which may be suitable for transplanting. These include seedlings and saplings of Sugar Maple, American Basswood, Black Walnut, and Hawthorns. A small woodland pocket within polygon 4 also contains spring ephemerals, such as Yellow Trout Lily and Downy Yellow Violet, that can be transplanted into nearby woodland areas such as polygons 6.1, 6.2, 6.3, thereby retaining these species on the local landscape and increasing the ecological value of these small cultural woodlands.

The detailed restoration and enhancement plan should identify the approach used for transplanting, as well as the timing for transplanting. In general, it is recommended that as much soil be taken with the plant when transplanting to improve establishment success. Ideally, plants should be transplanted in the fall when they can be identified and have gone dormant. Transplanting during other times of the year may require that the plants are stored temporarily on or off site while grading and site preparation is being completed. If temporary storage is required, the plants should be watered frequently to avoid

desiccation. Spring ephemerals are better transplanted in the early spring or may be flagged in the spring for fall transplanting.

7.1.2.3. BUILDING & LIGHTING DESIGN

Windows adjacent to woodlands should be designed to minimize bird strikes, particularly for those within the height of the canopy (e.g. up to 20 m). Birds do not perceive glass and can be injured or killed by collisions when they attempt to fly into reflections or apparent spaces that can be seen through windows on corners. Window glazing at street level should be chosen to minimize the risk for bird collisions. This can be achieved by treating glass with a densely-patterned custom window film for windows within the height of canopy; this pattern should have a minimum density of 5 cm (vertical) x 10 cm (horizontal) apart (FLAP, 2016). Further guidance is provided in the Toronto Green Standard, version 3.0.

Bird-friendly lighting practices also apply to outdoor lighting design. This includes using of minimal or muted lighting, minimizing direct upward lighting, using reflectors to minimize the spread of light, using motion sensors to minimize light pollution, positioning light standards to minimize reflections in windows, and avoiding up-lighting (City of Toronto, 2007).

7.1.2.4. BAT HABITAT MITIGATION

As per MECP recommendations, no trees identified as suitable maternity roost habitat should be removed between May 1 and September 30 in case migratory bats (Endangered or otherwise) are using them. If tree removal is required outside of this activity window, the MECP should be contacted immediately to determine permitting requirements. An Overall Benefit Permit would likely be required. Correspondence with the MECP is provided in Appendix J.

7.1.2.5. REPTILE HABITAT MITIGATION

Snakes

Eastern Garter Snake was observed in the cultural savannah community (polygon 4), west of the pond (polygon 5.1) in May, July and August 2019. It is possible that there are hibernacula present within the polygon 4 community. Snake hibernacula are considered Significant Wildlife Habitat (OMNRF 2015) and are protected under the PPS (Ontario Government, 2020). Given the connection between polygon 4 and adjacent natural areas, some efforts can be taken to mitigate and enhance potential snake habitat which may include:

- Awareness - Prior to construction, review snake observations and potential habitat. Record any sightings during construction.
- Avoidance - Refrain from mowing, using herbicide or otherwise removing ground vegetation or low-lying shrubs, which provide important cover for snakes as they move throughout the habitat. Avoid significantly increasing canopy closure, such as through large-scale tree or shrub planting
- Exclusion fencing - fence off potential habitat prior to construction activity. Bury fencing a minimum of 10 – 20 cm and vertical height of at least 60 cm. See Section 7.1.2.6 for more detail.

- Enhancements - Construct hibernacula to enhance exiting habitat. Maintain or create linkages between natural areas. Maintain or replace natural structures, including cover objects (e.g. rocks, rock piles, and logs). Establish buffers around natural areas.
- Snake Surveys - conduct wildlife sweeps in any natural areas that may be impacted by construction activities during the snake active season (April-October).
- Timing – Impacts on natural areas and structures should be avoided during hibernation period (September-May). Avoid activities that will result in the alteration of the water table or surface/subsurface drainage (e.g., installing tile beds, ditching, dewatering, etc.) between September 15 and May 15 (Kraus et al. 2010, Parks Canada Agency 2012). Impacts on natural areas and structures should be avoided during hibernation period (September-May).

See Best Management Practices for Identifying, Managing and Creating Habitat for Ontario's Species at Risk Snakes (OMNRF 2018) for further details.

Turtles

A single individual Snapping Turtle was observed by Geoprocess in 2015 in polygon 5.1. No Turtles were observed during 2019 field surveys. Candidate Significant Wildlife Habitat Turtle Wintering Areas was present in Polygon 5.1 and Candidate Turtle Nesting Areas may exist within 100 meters of polygon 5.1. In order to prevent impacts on Turtles and turtle habitat mitigation measures can take place which may include:

- Awareness - have workers informed on presence of turtles and possible nesting activity. Report and sighting of turtles to the Ministry of the Environment, Conservation and Parks (MECP). If a nesting turtle is located, construction activity must stop until the turtle has finished nesting and left the area.
- Exclusion fencing - physically preventing turtles from entering the work area at any time prior to and during construction, particularly during the nesting season (May-July). Regularly check fences and repair any breaches. See Section 7.1.2.6 for more detail.
- Timing – Conduct activities outside turtle nesting and incubation season to avoid and mitigate potential negative impacts. Active season from April-October. Avoid impacts to water table during the hibernation period from October-April.

7.1.2.6. SEDIMENT AND EROSION CONTROL INCLUDING INTERIM WILDLIFE EXCLUSION FENCING

A sediment and erosion control (ESC) plan will need to be prepared at the site plan approval stage. This plan should include silt fence at the limit of all VPZs, and any other areas where water may discharge to adjacent lands. The silt fence will serve to minimize the risk of water borne sediments entering the adjacent properties and ensure that no small terrestrial wildlife, such as snakes or amphibians, can access the active construction site from the PSW or adjacent properties and potentially be injured. The silt fence should be placed a) at the limit of proposed grading works on each edge of the property, b) at the buffer limit from the PSW, and c) along the perimeter of the existing channel. It is assumed that the new channel will be largely built in the dry and put on line after seeding and plantings are installed; an interim silt fence should be installed along each side of the new channel at the limit of the 7.5 m setback from the regional storm event. Inspection and maintenance of all silt fencing should start after

installation is complete and construction initiated, with inspection reports completed on a weekly basis during active construction or after a rainfall event of 13 mm or greater. Maintenance should be carried out, within 48 hours, on any part of the facility found to need repair. Once construction and landscaping has been substantially completed, the silt fence should be removed, and any accumulated sediment removed to be disposed of offsite.

Temporary small wildlife exclusion from the active construction areas will be addressed by the silt fence along the existing channel and at the outside limit of feature buffers. This is intended to prevent movement of wildlife from the Core Areas and Linkages into areas under construction. Erosion control fabric (1 m wide and embedded 15-20 cm below soil surface) will be affixed to a paige wire fence held in place by sturdy cedar posts and t-bars meeting or exceeding HCA standards.

7.1.2.7. PREVENT ENCROACHMENT INTO, WETLANDS AND WOODLANDS

A post-construction fencing and wildlife exclusion plan will be prepared at the detailed design stage to prevent future encroachment and dumping into wetlands and woodlands, and to enclose wildlife movements within the buffers around Core Areas and Linkages, and along the new open channel block to the limit of the property. Where driveway and road crossings are present, either a solid retaining wall at least 0.75 m in height (currently proposed for the north property limit of the new channel), or a chain link fence with soil-embedded hardware cloth or equivalent material affixed, will be installed to provide continuous protection without gaps. This may incorporate sections of "living fences" (i.e. dense plantings of thicket-forming vegetation), or treed screening buffers only where the risk of small wildlife conflicts is considered to be lower. Appendix N contains a list of specifications for the protective fencing approach based on Credit Valley Conservation's Fish and Wildlife Crossing Guidelines (2017). The following recommendations are provided for the fencing plan:

7.1.2.8. SALT MANAGEMENT PLAN

A salt management plan or best management practices should be developed at the detailed stage. Some general recommendations for the salt management plan to minimize the impacts of salt on the natural heritage features include:

- Create specific snow storage areas on the site plan. Snow storage areas should not be adjacent to natural heritage features or their VPZ, or in areas that drain directly to these areas. Snow storage areas should drain to the stormwater system rather than directly to the wetlands or watercourses.
- Alternatives to salt should be explored to avoid or minimize the use of salt.

7.1.2.9. EDUCATION OF CONSTRUCTION CONTRACTORS

The lead Contractor shall designate one lead employee to receive training to coordinate weekly monitoring of protective works, educating sub-contractor personnel on wildlife risk avoidance, and where required, directing the safe capture and relocation of small wildlife that are encountered in construction work areas. The designated employee shall be onsite during working hours and be available to respond to wildlife encounters. The required training will be provided at the time of initial silt fence installation by the Owner's ecology consultant, Dougan & Associates. To minimize wildlife

encounters during the construction phase of the project, it is recommended that training session be conducted with all construction contractors.

7.1.3. CONSTRUCTION MEASURES

7.1.3.1. TREE PROTECTION

Recommended tree protection measures are provided in Section 7.1.2.1.

7.1.3.2. MIGRATORY BIRDS

To be in compliance with the Migratory Birds Convention Act (MBCA, 1994), any vegetation removal on the site should be done outside of the breeding bird window, which for this site would be approximately April 15 to August 15. If any vegetation removal is to occur within this window, a qualified avian ecologist should first check the vegetation to be removed to ensure that there are no migratory birds covered by the Act nesting within it. If any birds are found nesting then, in consultation with Environment Canada, a suitable buffer should be established around the nest, and no activities will be permitted with this buffer until the birds have left.

Vegetation removal should not occur within the active nesting season (i.e., April 15 to August 15). If the areas proposed for development are thoroughly checked during the active breeding season for bird nests by a qualified biologist during the construction phase, and no nests are found, then construction may be permitted.

7.1.4. POST-CONSTRUCTION MEASURES

7.1.4.1. TREE COMPENSATION

Tree compensation requirements are provided in Section 7.1.2.1.

7.1.4.2. RESTORATION MONITORING

A detailed monitoring plan should be included in the restoration and enhancement plan to ensure the goals and objectives outlined in the restoration plan are met. All plantings should be monitored and maintained during a two-year warranty period and follow-up replacement planting will be required for all trees and/or shrubs that do not survive.

7.1.4.3. WETLAND MONITORING

To ensure that the PSW is not impacted by the proposed development, it is recommended that a monitoring plan be developed. The monitoring plan should monitor the wetland vegetation communities, breeding amphibians, as well as the hydrology of the wetlands for a minimum of 3 years post-development to ensure that pre-development conditions are sustained or improved.

8. CONCLUSIONS AND RECOMMENDATIONS

This EIS has completed the site characterization based on a Terms of Reference agreed to by the City and NPCA. An assessment of features and functions was completed. Natural areas occur throughout and around the Subject Property including elements of the City's Natural Heritage System (Core Areas – Key Natural Heritage Features Woodland and Key Natural Heritage Features Wetland, Linkages) and NPCA regulated features (20 Mile Creek Significant Wetland Complex, watercourse, wetlands). These features and functions have been characterized, including an assessment of linkages. The Subject Property and Study Area contain high-quality upland forest and wetlands that provide habitat for wildlife, contain Candidate Significant Wildlife Habitat and Species at Risk (Butternut), and support a high diversity of native species. The Subject Property also provides opportunity for connectivity across the landscape via hedgerows, woodlands, and wetland linkage features.

Based on the current draft plan and concept grading and servicing plans, the anticipated impacts include:

- Minor and temporary impacts to the vegetation protection zones of two wetlands;Alteration of headwater drainage features that convey water to the 20 Mile Creek PSW;
- Removal of 229 trees within cultural savannah and hedgerow vegetation communities that provide a linkage function and potentially SAR Bat habitat;

Each of these impacts can reduced minimized at the detailed design stages or mitigated for through implementation of the recommendations in this report. These recommendations will be further refined through the detailed design stages, in particular around minimizing impacts to trees and linkage functions around the perimeter of the property. The Subject Property offers ample opportunity for the creation woodland, wetland, and meadow habitats through restoration of Vegetation Protection Zones and additional undeveloped areas. It is therefore recommended that, as a condition of approval, a detailed Landscape Restoration Plan be developed that encompasses these restoration and enhancement measures, and that relevant standards be applied to window glazing and exterior lighting. A Monitoring Plan is also recommended as a condition of approval. We believe that these approaches and measures will yield an integrated environmental management system which is consistent with current zoning of the lands, protects the key attributes and functions of the natural heritage system, and meets long term natural heritage policy objectives.

Respectfully submitted,

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